

# Evaluation of FAO/USAID Emerging Pandemic Threats Programme Phase II (EPT-2)

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# **Evaluation of FAO/USAID Emerging Pandemic Threats Programme – Phase II (EPT-2)**

**FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS**  
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## **Abstract**

The Food and Agriculture Organization of the United Nations (FAO) has been involved in the Emerging Pandemic Threats Programme (EPT-2), funded by the United States Agency for International Development (USAID) since 2014. The programme sets out to minimize impact of existing global pandemic threats and to detect, respond to and improve prevention of emerging threats.

Implementation of this programme at FAO has been carried out through 20 projects with efforts concentrated in 36 countries in Africa and Asia. It builds upon lessons learned in the first phase of the programme, in which FAO was involved in improving livestock disease surveillance, enhancing capacity of veterinary epidemiologists and laboratories and improving response to the avian influenza. EPT-2 focuses more in-depth in preventative measures to zoonotic novel pathogens thereby reducing the risk of emergence of such diseases. This evaluation aims to trace the contribution of FAO's interventions to the programme and assess its outcomes at global, regional and national level.

EPT-2 has largely achieved its objectives and outputs in terms of technical capacity development and disease strategy, but less so in terms of enabling policy, value chains and production. In line with FAO's 2011 One Health Action Plan (FAO, 2011), EPT-2's technical focus has strengthened traditional partnerships between FAO and technical livestock departments and ministries and built stronger collaborations with health and environment ministries.

The next phase of the EPT-2 programme could take advantage of renewed national, regional and global interest in ensuring that the COVID-19 experience is not repeated. FAO needs to fully utilize its convening power, partnerships, trusted status and experience of emerging pandemic threats to engage political and business leaders on the need to consolidate and scale up EPT-2-induced gains to improve pandemic preparedness.

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Special gratitude goes to the Emergency Centre for Transboundary Animal Diseases (ECTAD) staff in the FAO decentralized offices that were visited and consulted; the evaluation team is very grateful for their invaluable input and assistance. They include: the FAO Regional Office for Asia and the Pacific (Thailand), FAO Regional Office for Africa (Ghana), the FAO Regional Office for the Near East and North Africa (Egypt) and the FAO Country Offices in Bangladesh, Egypt, Ghana, Kenya, Lao People’s Democratic Republic, Nigeria and Viet Nam. The evaluation team is also extremely grateful for the support and guidance received from colleagues in the FAO Animal Health Service (Berhe Tehola, Keith Sumption, Wantanee Kalpravidh and Ahmed El Idrissi) and in the Emergency and Resilience Division (Dominique Burgeon, Rosanne Marchesich, Shukri Ahmed, Mirela Hasibra and Bianca Tonetti), as well as from other colleagues working on ECTAD at FAO headquarters.

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Lastly, the team would like to express its sincere gratitude to the numerous government representatives, regional bodies, resource partners, development partners and FAO staff who responded to its enquiries during this exercise and enriched the results of this evaluation.

## Acronyms and abbreviations

AMR	Antimicrobial resistance
AMU	Antimicrobial usage
ASEAN	Association of Southeast Asian Nations
ASF	African swine fever
ASL 2050	African Sustainable Livestock 2050
ATLASS	Assessment Tool for Laboratories and Antimicrobial Resistance Surveillance Systems
AU	African Union
AU-IBAR	African Union Inter-African Bureau for Animal Resources
CBPP	Contagious bovine pleuropneumonia
CDC	Centers for Disease Prevention and Control
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
ECTAD	Emergency Centre for Transboundary Animal Diseases
EMPRES-AH	FAO Emergency Prevention System for Animal Health
EMPRES-i	FAO Global Animal Disease Information System
EPT1	Emerging Pandemic Threats Programme – Phase 1
EPT-2	Emerging Pandemic Threats Programme – Phase 2
FAO	Food and Agriculture Organization of the United Nations
FETPV	Field Epidemiology Training Program for Veterinarians
FMD	Foot-and-mouth disease
FPMIS	Field Project Management Information System
GEMP	Good Emergency Management Practices
GHSA	Global Health Security Agenda
GLEWS	Global Early Warning System
H5N1	Highly pathogenic avian influenza
IGAD	Intergovernmental Authority on Development in Eastern Africa
LMT	Laboratory Mapping Tool
MERS	Middle East Respiratory Syndrome
MERS-CoV	Middle East Respiratory Syndrome Coronavirus
NSAH	FAO Animal Health Service
NSAL	FAO Livestock Information, Sector Analysis and Policy Branch
OED	FAO Office of Evaluation
OER	FAO Office of Emergencies and Resilience
OHW	One Health Workforce
OIE	World Organisation for Animal Health
PCR	Polymerase chain reaction
PPE	Personal protective equipment
PPR	Peste des Petits Ruminants
PVS	Performance of Veterinary Services
RAP	FAO Regional Office for Asia and the Pacific
RVF	Rift Valley Fever
SAARC	South Asian Association for Regional Cooperation
SARS	Severe acute respiratory syndrome
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
WHO	World Health Organization of the United Nations



## Executive summary

1. This final evaluation of the Emerging Pandemic Threats Programme – Phase 2 (EPT-2) aims to account to the United States Agency for International Development (USAID) and the Members of the Food and Agriculture Organization of the United Nations (FAO). It seeks to trace the contribution of FAO's interventions and assess its outcomes at global, regional and national level. It draws lessons from the EPT-2 implementation process to inform the next phase of the programme, which is in an advanced stage of planning.
2. The evaluation further assesses FAO's delivery methods and institutional arrangements with a view to enhancing effectiveness of delivery in future phases of the programme and in responses to other food-chain crises.
3. The evaluation covers all FAO-implemented activities in 36 countries under EPT-2, spanning its four main components: avian influenza, Middle East respiratory syndrome (MERS), African Sustainable Livestock 2050 (ASL 2050) and the emergency equipment stockpile project, which deploys specialist resources for on-site rapid response and the containment of disease outbreaks.
4. Another area of work covered by EPT-2, particularly in Asia, is antimicrobial resistance (AMR) for animal health.<sup>1</sup> While it does not fall under any of the four main EPT-2 components, AMR activities are incorporated into certain EPT-2 monitoring and evaluation (M&E) framework indicators.
5. The evaluation assessed the following aspects of EPT-2:
  - i. past and current relevance of EPT-2-related activities at global, regional and national level in the dynamic and evolving context of pandemic threats, risks, response needs and gaps in preparedness and response at different levels;
  - ii. the effectiveness of EPT-2 in supporting FAO to meet the three overarching purposes of the programme (to prevent the emergence of new zoonotic diseases, detect new threats when they emerge and provide timely and effective response to those diseases and threats);
  - iii. the connectedness of organizational relationships, EPT-2's work on capacity development and the sustainability of its interventions;
  - iv. how FAO has supported a One Health approach through capacity-building and policy and institutional support at national and regional levels;
  - v. the incorporation of gender into EPT-2 and how gender-related work has influenced effectiveness and results;
  - vi. the efficient use and coordination of technical expertise;
  - vii. the development and utilization of monitoring, evaluation and learning within EPT-2, including the identification of key lessons.

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<sup>1</sup> AMR is also an action package of the Global Health Security Agenda (GHS), on which USAID is focused.

**Conclusion 1.** The COVID-19 pandemic has significantly increased the relevance of EPT-2, as countries have been reminded of the gaps in their preparedness for emerging zoonotic diseases. First-hand understanding of the economic, social and health costs of a pandemic will increase and further enhance the value of EPT-2-style interventions as the COVID-19 pandemic progresses, fuels economic recession and disrupts the trade of agricultural products, risking another global food-price crisis. The next phase of the EPT-2 programme could take advantage of renewed national, regional and global interest in ensuring that the COVID-19 experience is not repeated. With robust review and some internal reorganization, FAO is in a strong position to consolidate the gains made through EPT-2 and to broaden the programme in terms of geographic coverage, scope and sustainability.

- **Recommendation 1.** As the COVID-19 pandemic has shown, the world is still unprepared for a pandemic, and threats such as avian influenza and MERS-CoV remain. Therefore, the evaluation team highly recommends that EPT-2 be continued and expanded.

**Conclusion 2.** EPT-2 has largely achieved its objectives and outputs in terms of technical capacity development and disease strategy, but less so in terms of enabling policy, value chains and production. The latter will require a shift in EPT-2's approach towards greater policy engagement, with significant influence on EPT-2's impact and sustainability.

- **Recommendation 2.** FAO's Emergency Centre for Transboundary Animal Diseases (ECTAD) must maintain the network of valuable expertise it used to implement EPT-2 to ensure that the necessary technical support remains available and that countries, especially the most vulnerable, develop and sustain the enduring capabilities they need to effectively prevent, detect and respond early to disease threats before they become regional or global crises.

**Conclusion 3.** In line with FAO's 2011 One Health Action Plan (FAO, 2011), EPT-2's technical focus has strengthened traditional partnerships between FAO and technical livestock departments and ministries and built stronger collaborations with health and environment ministries. Regional partnerships have strengthened in Asia and ECTAD has both called on and assisted the FAO/OIE/WHO Tripartite Alliance to support many aspects of EPT-2 work. EPT-2's partnerships with the private sector and civil society organizations were more superficial.

- **Recommendation 3.** FAO needs to fully utilize its convening power, partnerships, trusted status and experience of emerging pandemic threats to engage political and business leaders on the need to consolidate and scale up EPT-2-induced gains to improve pandemic preparedness. To reinforce progress, FAO must continue to support a cohesive EPT-2 package of objectives and broaden its scope to ensure the sustainability of outcomes in those countries ready to invest. This will require an emphasis on advocacy and high-level policy and, in light of COVID-19, strengthening particular components of the programme, such as the identification and surveillance of livestock and wildlife hotspots to reduce the risk of outbreaks and to ensure early detection and response to any that occur.

**Conclusion 4.** EPT-2 efforts to strengthen the sustainability of national systems to address emerging endemic disease and pandemic threats have focused on capacity development at the individual and organizational levels. The achievements to date form a solid basis for future sustainability. The policy, institutions and investments needed to keep laboratories, surveillance systems and outbreak investigations fit for purpose and adequately funded have yet to be fully developed in most countries.

**Conclusion 5.** EPT-2 has no explicit or consistent strategy to ensure gender analysis is undertaken or that the interests of women and disadvantaged sections of the population are integrated and addressed.

- **Recommendation 4.** Future EPT-2 work requires a robust gender strategy and a clearly articulated approach to engaging with minority groups. In the next phase, it is necessary to design a programme-level strategy for gender integration, as well as country-level gender action plans to address the interests of women and other disadvantaged sections of society. It is crucial to work with all such societal groups to improve disease surveillance and control. The strategy should also enhance efforts to improve the gender balance across all levels of staff, particularly at field level, and the gender sensitization of all related parties and stakeholder groups.

**Conclusion 6.** FAO's divisional collaboration (NSAH and OER) to operationalize ECTAD and implement EPT-2 has been highly effective; it forms a major supporting component of FAO animal health and has the potential to grow in scope of work and coverage. This partnership makes an important contribution to FAO Strategic Objective 5 (increasing the resilience of livelihoods to threats and crises) and raises the possibility of additional support for other Strategic Objectives and greater policy engagement. It raises FAO's profile at all levels.

- **Recommendation 5.** The evaluation recommends a high-level review of how ECTAD can support broader livestock-related work across the various technical departments and divisions, including FAO's Animal Production and Health Division (NSA), fisheries, food safety, AMR and resilience building in the face of disasters and emergencies. The review should be carried out by the appropriate key strategic offices and consult with decentralized offices and resilience hubs, where considerable experience and viewpoints are to be found on how ECTAD might evolve to support a more effective and efficient programme of livestock work.

**Conclusion 7.** EPT-2's multi-layered and complex M&E system posed significant challenges for the M&E unit and ECTAD technical staff. Good progress was made in training, developing reporting templates and guiding an array of M&E officers at national and regional level. These staff have proved a valuable contribution to project monitoring and are a resource for other projects. Significant lessons have been learned on M&E modalities, which should lead to improved feedback and lesson learning in any future phase of the programme.

# 1. Introduction

## 1.1 Purpose of this evaluation

1. This final evaluation of EPT-2 aims to account to USAID and to FAO Members. It seeks to trace the contribution of FAO's interventions to the programme and assess its outcomes at global, regional and national level. It draws lessons from the EPT-2 implementation process to inform the next phase of the programme, which is in an advanced stage of planning.
2. The evaluation further assesses FAO's delivery methods and institutional arrangements with a view to enhancing effectiveness of delivery in future phases of the programme and in responses to other food-chain crises.
3. The evaluation findings and conclusions will be of interest to FAO's implementing partners. There is keen interest in emerging pandemic threats following the outbreak of COVID-19. The findings of this evaluation are relevant to the future decision-making of partners, including the Tripartite collaboration between FAO and the World Health Organization (WHO) and the World Organisation for Animal Health (OIE), the Inter-Agency Standing Committee, Level 3 Activation Procedures for Infectious Disease Events and USAID, as the primary EPT-2 donor.

## 1.2 Scope and objectives of the evaluation

4. The evaluation covers all of the FAO-implemented activities in 36 countries under the EPT-2 programme spanning its four main components:
  - i. **avian influenza**: prevention measures including guidance on poultry production, biosecurity and sanitary standards, and vaccine quality and vaccination, as well as early detection and rapid response;
  - ii. **Middle East respiratory syndrome (MERS)**: surveillance and analysis to understand why, how and where the disease is spreading and the associated risk factors;
  - iii. **Africa Sustainable Livestock 2050 (ASL 2050)**: policy guidance to ensure sustainable and biosecure livestock production, assuring livelihoods, food security and nutrition; and
  - iv. the **emergency equipment stockpile** project: deploying specialist resources for on-site rapid response and the containment of disease outbreaks.
5. Another area of work covered by EPT-2, particularly in Asia, is antimicrobial resistance (AMR) for animal health. While it does not fall under any of the four main EPT-2 components, AMR activities are incorporated into some EPT-2 monitoring and evaluation (M&E) framework indicators. Therefore, the evaluation includes the 'Addressing antimicrobial usage in Asia's livestock production industry' project (OSRO/RAS/502/USA).
6. The evaluation analyses the coherence and complementarity of FAO-led projects and activities with those of other implementing partners in the USAID-funded EPT-2

consortium.<sup>2</sup> It also examines how FAO's EPT-2 activities aligned with other efforts to strengthen One Health and animal health systems in target regions and countries.

7. The evaluation also includes an examination of EPT-2 activities within the institutional context of the FAO Animal Health Service (NSAH, formerly known as AGAH), which is relatively complex. While EPT-2 is implemented by ECTAD, it has functional linkages with other NSAH initiatives.<sup>3</sup> NSAH is also actively engaged in initiatives at the Tripartite level on timely data and information sharing, and early warning and joint global responses to transboundary animal disease emergencies, including zoonotic influenza and AMR.
8. The evaluation covers the whole five-year implementation period of EPT-2 (from October 2014 to December 2019) and takes into account previous evaluations of associated pandemic and transboundary animal disease work.<sup>4</sup> Though the evaluation explores the extent to which there has been complementarity and coherence between EPT-2 and the Global Health Security Agenda (GHSa), it does not examine activities or outputs funded by GHSa. The latter are being extended to 2021 and will, therefore, be subject to a separate evaluation closer to the revised completion date.
9. The aim of the evaluation is to provide FAO, particularly NSAH, the Office of Emergencies and Resilience (OER, previously the Emergency and Resilience Division, PSE), the Strategic Programme 5 (SP5) team, including the ECTAD team, and their internal and external partners with knowledge and evidence that can be used to support and improve current and future strategies to counter epidemic and pandemic threats, as well as broader livestock-related emergencies and responsiveness to the needs of FAO's decentralized offices and Members.
10. To this end, the evaluation assessed the following aspects of EPT-2:
  - i. past and current relevance of EPT-2-related activities at global, regional and national level in the dynamic and evolving context of pandemic threats, risks, response needs and gaps in preparedness and response at different levels;
  - ii. the effectiveness (in terms of results achieved and the impact of those results) of EPT-2 in supporting FAO to meet the three overarching purposes of the programme (to prevent the emergence of new zoonotic diseases, detect new threats when they emerge and provide timely and effective response to those diseases and threats);
  - iii. the connectedness of organizational relationships, EPT-2's work on capacity development and the sustainability of its interventions;

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<sup>2</sup> PREDICT-2; the One Health Workforce (OHW) (Southeast Asia One Health University and One Health Central and East Africa Network); Preparedness and Response Project; United States Centers for Disease Control and Prevention (CDC).

<sup>3</sup> For example, the Emergency Prevention System for Animal Health (EMPRES-AH), its Global Animal Disease Information System (EMPRES-i), the European Commission for the Control of Foot-and-Mouth Disease (EuFMD), the Peste des Petits Ruminants (PPR) Secretariat, the Global Early Warning System for Major Animal Diseases including Zoonoses (GLEWS) (an initiative of FAO, OIE and WHO), plus the OIE/FAO Network of Expertise on Animal Influenza (OFFLU), the Global Framework for Transboundary Animal Diseases and the Emergency Management Centre for Animal Health (EMC-AH).

<sup>4</sup> Two real-time evaluations of FAO's work on highly pathogenic avian influenza (HPAI) (FAO, 2007; 2009); the Evaluation of FAO Strategic Objective 5 (FAO, 2016a); the Evaluation of FAO's Emergency Prevention System (EMPRES) Programme in Food Chain Crises (FAO, 2016b); and the Joint FAO–OIE Evaluation of the Global Framework for Transboundary Animal Diseases (FAO and OIE, 2018).

- iv. how FAO has supported a One Health approach through capacity-building and policy and institutional support at national and regional levels;
  - v. the incorporation of gender into EPT-2 and how gender-related work has influenced effectiveness and results;
  - vi. the efficient use and coordination of technical expertise;
  - vii. the development and utilization of monitoring, evaluation and learning within EPT-2, including the identification of key lessons.
11. The full list of evaluation questions can be found in [Annex 1. Terms of Reference and evaluation matrix.](#)

### 1.3 Methodology

12. The evaluation took a consultative and transparent approach with internal and external stakeholders. Where possible, evidence was triangulated to underpin validation and analysis prior to forming conclusions and recommendations.
13. The evaluation began with a scoping exercise in August 2019, which included assembling the relevant documentation for a portfolio analysis (see Annex 3) and initial interviews with key informants (from September to December). The terms of reference of the evaluation were agreed and an inception report was formulated, including a stakeholder analysis, detailed information on evaluation approach and methodology, the evaluation matrix, information on and justifications for site visits, an update of the limitations and risks, and a timeline and deliverables for the evaluation. The inception report was shared with the evaluation team to ensure a coordinated and consistent approach when the team split up for fieldwork.
14. The evaluation team consisted of four external consultants, supported by two members of the FAO Office of Evaluation (OED) staff. The four consultants included a technical team leader with a background in transboundary animal health, evaluation and policy; two veterinary consultants with particular experience in evaluation, One Health and zoonotic disease management in South and Southeast Asia plus West, Central and East Africa; and an evaluation specialist in gender equity and socioeconomics.
15. The evaluation approach used was essentially qualitative and based on the following:
- i. **Documentation review:** Key EPT-2 documents (proposals, progress reports and training materials, including summaries of activities implemented and lessons learned from the EPT-2 targeted countries), reports of initiatives linked to EPT-2 – AMR, One Health, Global Early Warning System (GLEWS), the Emergency Management Centre for Animal Health (EMC-AH), GHSA – and previous evaluations relevant to EPT-2.
  - ii. **Key informant interviews** (in person and/or virtually), based on the evaluation matrix (see Annex 1), with FAO staff and key stakeholders identified in the inception report:
    - FAO and ECTAD staff at headquarters, regional, subregional and country level;
    - national ministries responsible for health, livestock, the environment and wildlife (national and sub-national) and any One Health platform staff;

- value-chain actors, including farmers, market traders and farmer associations, private vets, veterinary associations and laboratories;
  - universities and training centres, technical trainers, One Health coordinators and researchers;
  - regional economic communities (RECs), particularly coordinators and staff working on livestock, agriculture and One Health;
  - representatives of development partners, including USAID staff in Washington, D.C. and at country level, the Australian Department of Foreign Affairs and Trade, the European Union and international agencies, such as OIE, WHO and World Bank;
  - EPT-2 consortium partners: PREDICT 2; the One Health Workforce (OHW), comprising the Southeast Asia One Health University Network and One Health Central and East Africa Network; the Preparedness and Response Project; and the United States Centers for Disease Control and Prevention (CDC);
  - representatives of civil society groups.
- iii. **Regional and country visits** were made to seven countries that host ECTAD offices implementing EPT-2 (Bangladesh, Egypt, Ghana, Kenya, Indonesia, Nigeria and Sierra Leone) and to FAO and ECTAD regional and subregional offices and teams (in Accra, Cairo, Nairobi and Bangkok). Countries were selected after discussions with FAO staff based on a range of criteria designed to capture all components of EPT-2 and the longevity of activities and lessons learned (see Appendix 1). Two further countries were to be visited (the Lao People’s Democratic Republic and Viet Nam), but these visits were cancelled due to COVID-19. Skype calls were held instead.
- iv. An **online survey** was sent to countries with EPT-2 projects, but which were not visited by the evaluation team, to assess views on the relevance of EPT-2 and One Health and to garner information on EPT-2 results and lessons learned. The survey design differentiated between FAO EPT-2 staff (the “internal survey”) and government partner staff (the “external survey”). An analysis of the survey findings can be found in [Annex 3](#) and has been incorporated into the overall evaluation findings.
- v. Virtual calls were made with representatives in other key countries and organizations. The full list of people interviewed is included as Appendix 1.
16. The evaluation also drew on recent FAO Country Programme Evaluations for Indonesia, Sierra Leone and Ethiopia, which examined ECTAD activities. EPT-2 evaluation team members were involved in the compilation of the Indonesia and Sierra Leone evaluations.
17. The evaluation team analysed the evidence collected in a four-day workshop in February 2020 and presented its preliminary findings and conclusions to a FAO stakeholder workshop in Rome. The initial recommendations were discussed and refined based on stakeholders’ initial feedback.

## 1.4 Limitations

18. As is often the case with evaluations, there is a gap between the ideal evaluative pathway and the actual process. The most significant limitations of this evaluation were:

- i. Missions to the Lao People's Democratic Republic and Viet Nam had to be cancelled due to COVID-19. Both countries were potentially highly pertinent to the evaluation and it was difficult to draw information from key informants on Skype calls. It was noted that the Skype conversations tended to be more superficial than physical meetings, as they were time restricted and constrained by language barriers. There was a tendency to focus on the positives and the triangulation of evidence was far more challenging.
- ii. Skype conversations were organized with ECTAD teams in some of those countries that could not be visited due to time and funding constraints. The medium was found to be relatively limited and superficial compared with in-person visits.
- iii. To cover the countries that were visited, the evaluation team split in two, with one half covering Africa and the other Asia. While this improved coverage, there was inevitably some loss of perspective when it came to forming conclusions. There were significant differences between the two (noting that EPT (1 and 2) has been more involved in Asia for far longer). The mission to Kenya was curtailed somewhat due to security concerns.
- iv. GHSA and EPT-2 activities had to be carefully differentiated in Africa. Both are implemented by ECTAD and field staff did not necessarily know the exact funding stream for their work. The evaluation made every effort not to report GHSA outputs and this frequently required checking who actually funded a particular activity.

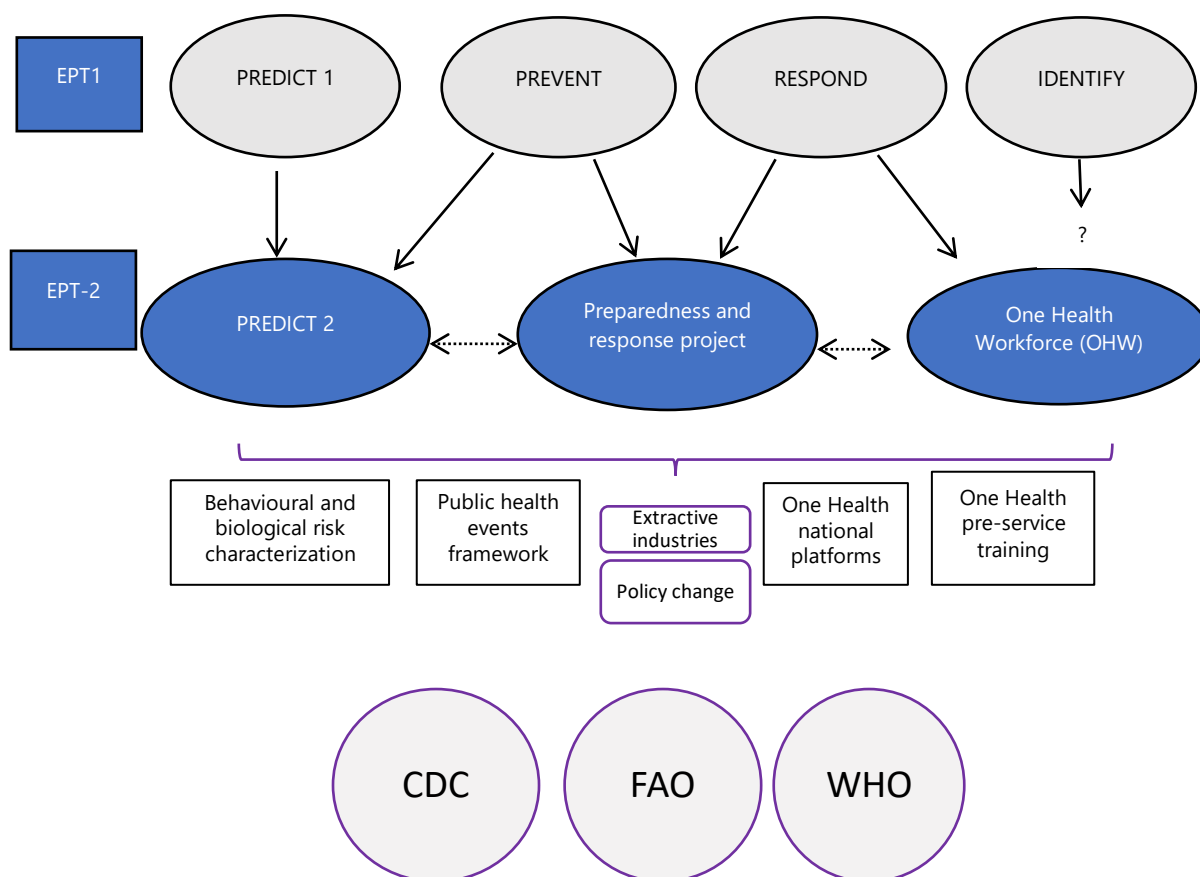


## 2. Programme background and context

### 2.1 Programme context

19. Since October 2014, FAO has been conducting the five-year EPT-2 programme, funded by USAID, with an overall budget of around USD 122 million. EPT-2 is implemented by ECTAD, a joint platform between NSAH and OER. FAO is a member of the EPT-2 consortium assembled by USAID to carry out a long-term national and regional information and capacity-building programme to improve prevention, detection and response to outbreaks of EPTs, mostly zoonotic diseases, using a One Health approach.
20. USAID began engaging in formal support for zoonotic diseases in mid-2005, with the highly pathogenic avian influenza (HPAI) programme, which focused on controlling the H5N1 avian flu. This was followed by a series of projects in the least developed countries to boost preparedness, prevention and response. In 2009, it launched the five-year worldwide EPT1 to support the detection of new disease threats and build capacity for preparedness and response. Concurrently, in response to the H1N1 flu pandemic, which originated in Mexico, USAID established an EPT-plus programme to focus on novel influenza A viruses. As part of the EPT1 consortium, FAO focused on laboratory capacity development in Africa and Asia as part of the IDENTIFY project and on surveillance for the genetic diversity of influenza A virus in selected countries in Asia (Bangladesh, Viet Nam and China). It also conducted risk analysis and modelling of the emergence of high-impact influenza A viruses from the livestock sector in Asia under EPT-plus (see Figure 1).
21. Through these projects, FAO worked to strengthen disease surveillance in livestock, enhance the capacity of veterinary epidemiologists and laboratories and improve understanding of the risks associated with poultry movements and trade, as well as the response to avian influenza outbreaks. As a result, the number of H5N1-affected countries decreased from 53 in 2006 to 11 in 2014, while the number of poultry outbreaks and human cases more than halved over the same period. Countries were better prepared to detect novel avian influenza viruses as a result, including H7N9.
22. While EPT-2 continued many of the activities started with the avian influenza and EPT1/Plus programmes, it was broader in scope. EPT-2 focused on mitigating the impact of novel high-consequence pathogens originating in animals, with a view to enabling the early detection of new disease threats, effectively controlling those threats, enhancing national-level preparedness in advance of outbreaks and, ultimately, reducing the risk of such diseases emerging by minimizing certain human behaviours and practices that trigger the spill-over and spread of new pathogens.

**Figure 1: Transition from EPT-1 to EPT-2**



Source: GHSA work planning meeting, Mainz, Germany, 1–2 June 2015.

23. EPT-2 was, therefore, designed to build on lessons and knowledge from the previous programmes, focusing on drivers and practices that enable the emergence, multiplication and spread of pathogen threats. Evidence is growing that the majority of novel, emergent zoonotic infectious diseases originate in animals, especially wildlife, and that the principal drivers of their emergence are tied to human activity (Mackenzie and Jeggo, 2019). These include changes in ecosystems and land use, intensification of agriculture, urbanization and international travel and trade. Consequently, a collaborative and multidisciplinary approach that cuts across the boundaries of animal, human and environmental health enables a better understanding of emerging zoonotic diseases and their context, facilitating risk assessment and the development of plans for response and control. This is at the heart of the One Health approach.<sup>5</sup>
24. The One Health approach was central to EPT-2. While there is no common definition of One Health, CDC and the One Health Commission define it as “a collaborative, multi-sectoral, and transdisciplinary approach – working at the local, regional, national, and global levels – with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment” (CDC, 2018; One Health Commission, n.d.).

<sup>5</sup> The concept of One Health is not new, but in recent history, the term was used after the SARS outbreak of 2003 and coined by the Wildlife Conservation Society in the 12 “Manhattan Principles”, which recognize the critical importance of collaborative, cross-disciplinary approaches for responding to emerging and resurging diseases.

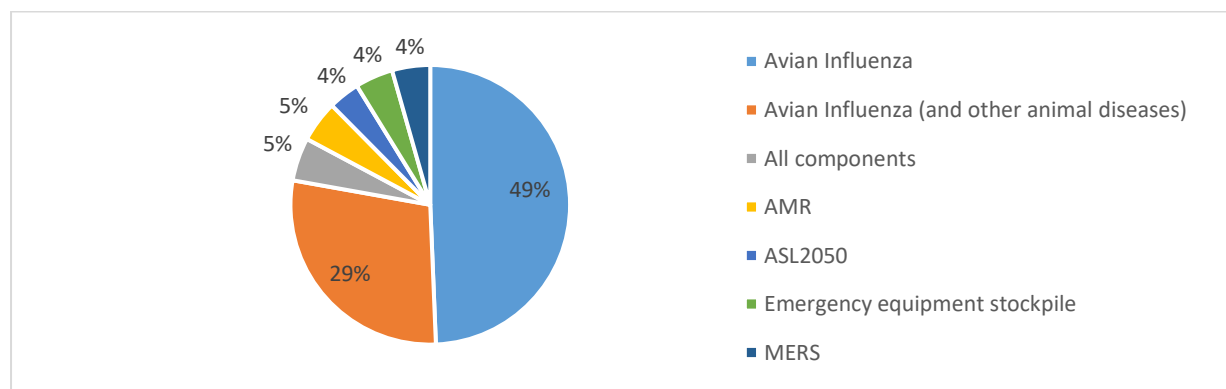
25. The complexity of institutional change to facilitate a substantive One Health approach, where different disciplines plan together based on a shared budget, infrastructure and training programmes, is well recognized. It has been noted that while a central inter-ministerial committee or taskforce is easy to establish, this does not guarantee effective operational links between sectors. There is growing recognition that it is crucial to develop mechanisms that ensure appropriate joint activities in the core functions needed to manage outbreaks, with clearly defined roles and responsibilities. Government inertia, plus a lack of awareness and knowledge on how to build effective One Health mechanisms, appear to be a key target for various One Health advocacy and research organizations, donor agencies, the World Bank and United Nations bodies.
26. FAO and other EPT-2 consortium partners supported countries and regional bodies in developing and using the One Health approach through EPT-2 project activities. These efforts were aligned with FAO's own One Health Action Plan (FAO, 2011), which was largely based on FAO's experience of H5N1 control and its work on food safety. The Action Plan focuses more on supporting Members and partners in adopting a One Health approach, rather than improving FAO's internal use of One Health.
27. Working in Africa and Asia, USAID initially organized EPT-2 around seven strategic areas of focus (SAFs):
  - i. developing longitudinal data sets for understanding the biological drivers of viral evolution, spill-over, amplification and spread of new viral threats;
  - ii. understanding the human behaviors and practices that underlie the risk of evolution, spill-over, amplification and spread of new viral threats;
  - iii. promoting policies and practices that reduce the risk of virus evolution, spill-over, amplification and spread;
  - iv. supporting national One Health platforms;
  - v. investing in OHW;
  - vi. strengthening national preparedness to respond to events of public health significance;
  - vii. strengthening global networks for real-time bio-surveillance.
28. USAID allocated certain SAFs to certain EPT-2 consortium partners and set their scope of work. For example, FAO's work focused on SAFs 1, 3, 4, 6 and 7, with a limited amount of work on wildlife. Communication for behavioural change was allocated elsewhere, but FAO contributed to a degree by advocating for better practices and policy adoption.
29. In 2016, the focus of the EPT-2 programme was reoriented to include strengthening countries' capacity to address endemic priority zoonotic diseases. This was driven by the

global need to align all activities to the GHSA<sup>6</sup> and Joint External Evaluation (JEE).<sup>7</sup> This reorientation appears to have been supported by certain countries in Africa, where Ebola virus disease had been observed in livestock, but not in the human population. Under the Ebola-specific component of EPT-2,<sup>8</sup> which was later dropped, FAO was to investigate which livestock hosted the Ebola virus and other filoviruses, as well as the behaviours and conditions facilitating their evolution, amplification and spread. A consultative stakeholder’s workshop was held in Nairobi in 2016 to make EPT-2 stakeholders aware of the realignment of the FAO component to the (EPT-2) GHSA programme and JEE.

### 2.1.1 Overview of the FAO portfolio on EPT-2

30. FAO’s EPT-2 programme is implemented through 20 projects, each set in a particular context and driven by specific country requirements. Under EPT-2, FAO has worked to develop the capacity of more than 36 countries in Africa and Asia to pre-empt or combat at source emerging infectious diseases that could threaten human health.
31. Figure 2 illustrates the share of resources allocated to the different components of EPT-2. In addition, a few projects focused on avian influenza plus other animal diseases. EPT-2 resources have predominantly been allocated to avian influenza in countries in South and Southeast Asia and Egypt, with some resources allocated to other components of the programme based on regional need. ASL 2050 and MERS cover selected countries in Africa, while the EPT-2 AMR project is focused on Asia.

**Figure 2: Resource allocation across EPT-2 components**



Source: Project documents and FPMIS.

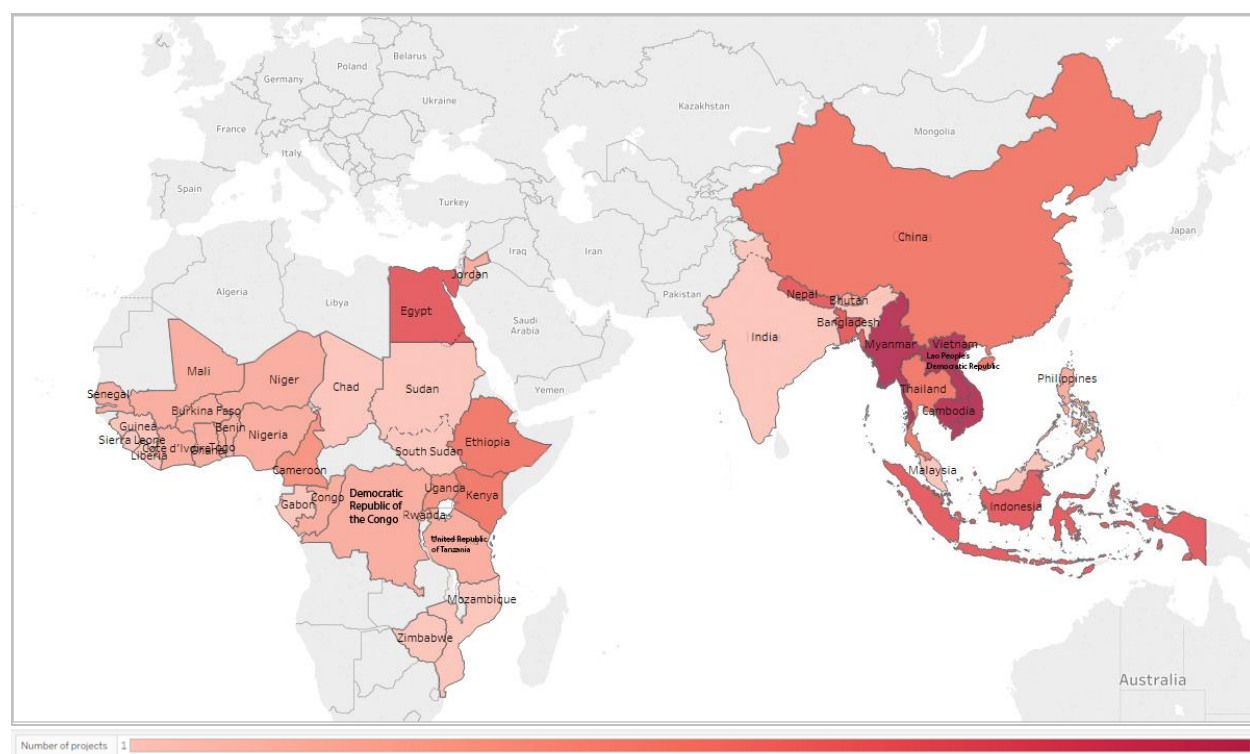
<sup>6</sup> The GHSA was launched and endorsed by the G7 group of countries in February 2014 and brings together more than 65 nations, international organizations and non-governmental stakeholders to build national capacity to help reduce the threat of infectious diseases and to elevate global health security as a national, regional and global priority. Countries and organizations can sign up to some or all of 18 technically orientated action packages. One USAID contribution to GHSA includes USD 66 million in grants to FAO for activities that complement EPT-2 in Africa and Asia. FAO GHSA contributes to five action packages: zoonotic diseases, biosafety and biosecurity, national laboratory systems, workforce development and antimicrobial resistance. FAO activities funded by GHSA will not be evaluated with EPT-2, but separately, at a later date.

<sup>7</sup> The JEE is a transparent, external evaluation of a country’s ability to find, stop and prevent disease threats. Similar to a report card, 19 areas of epidemic preparedness and response capacity are scored, first by a group of domestic experts and then by an external group of international experts. The assessment is voluntary, conducted every five years, and the results are reported by WHO.

<sup>8</sup> Projects with Ebola components included OSRO/GLO/407/USA, OSRO/GLO/504/USA, OSRO/GLO/506/USA and OSRO/GLO/508/USA.

32. FAO's work under EPT-2 covers 36 countries. Figure 3 shows the geographic distribution of its projects. A few projects cover West and Central Africa, while around 70 percent of resources target Asia. Most of these projects started in 2014–2015 and were supposed to end in or before December 2019. The end date was revised for some projects and six continued to July 2020. Projects in most countries are built on previous work done through EPT1 and EPT-plus and FAO's long engagement in the countries in question.
33. The EPT-2 portfolio comprises projects that directly target the four main programme components, or projects that support overall programme implementation. Common objectives include strengthening prevention, detection and response systems, One Health workforce capacity and the enabling environment for multi-sectoral collaboration. The avian influenza and MERS projects generally cover (1) diagnosis, surveillance and monitoring systems; (2) integrated control of animal diseases; (3) dissemination of policies and good practices for efficient farm management activities, reduction of disease emergence and stakeholder collaboration; (4) strengthening the competencies of the workforce and laboratories; (5) strengthening national preparedness; and (6) One Health coordination. ASL 2050 projects are designed to anticipate disease outbreaks resulting from an increase in demand for livestock products in Africa. They aim to strengthen government and stakeholder capacity to assess the livestock sector and policy implications of market trends on animal health, public health and the environment.
34. Projects to support the implementation of the programme focused on management and coordination. One aimed to enhance FAO country and regional capacity for project performance monitoring, with activities such as baseline data collection and indicator pilots for all consortium partners. The project also included implementing recommendations and corrective improvements, and training country M&E focal points and staff.

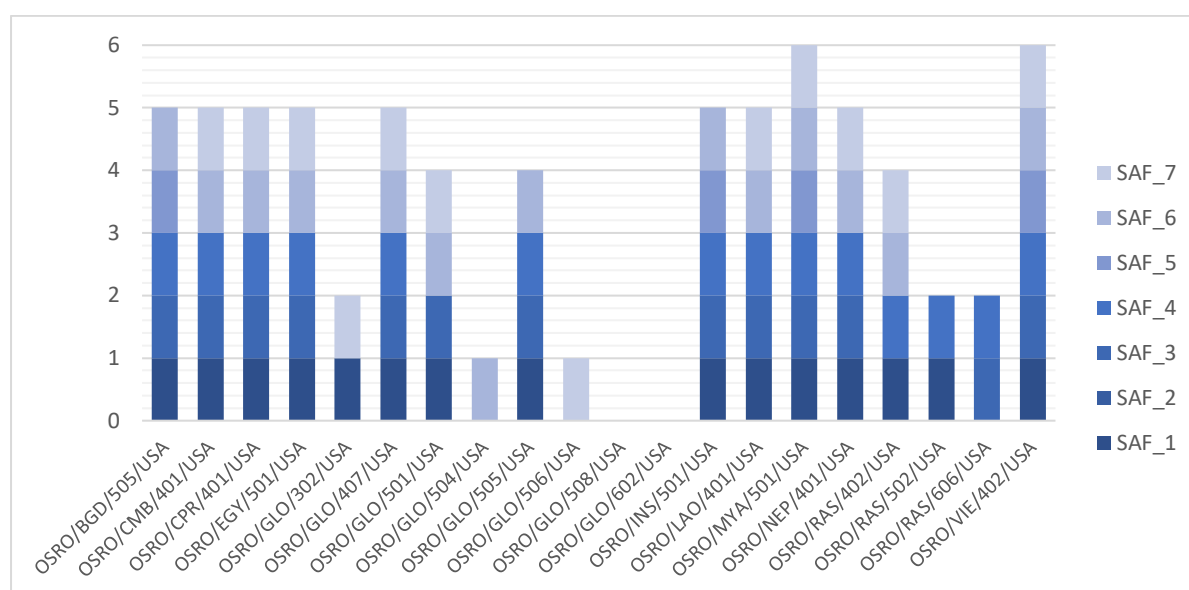
**Figure 3: Geographical distribution of EPT-2 projects**



Source: Created by evaluation team on Tableau software. Modified to comply with [UN. 2020. Map of the World](#).

35. The seven SAFs (see paragraph 27) were at the core of the original EPT-2 programme (Figure 4), though this changed when EPT-2 was reoriented towards GHSA, complicating M&E for all projects (see section 4.2). The most prominent SAFs are SAF1 (developing longitudinal data sets for understanding biological drivers of disease emergence) and SAF6 (strengthening national preparedness to respond to events of public health significance). SAF2 (understanding human behaviours and practices that underline the risk of spill-over, amplification and spread of new viral threats) is not covered by any of the projects, while there is only limited coverage of SAF5 (investing in OHW). Project documents also clear cite SAF2 and SAF5 as being outside FAO’s scope of work. Projects to support programme implementation do not contribute directly to most of the SAFs.

**Figure 4: Project linkages with the original EPT-2 SAFs**



Source: Evaluation team’s review of project documents.

36. The EPT-2 projects included a broad range of stakeholder groups, with some variation by component (Table 1). Most projects were closely implemented with technical ministries responsible for livestock resources, however, the ASL 2050 team worked with other ministries, including agriculture, health and environment.

37. The EPT-2 consortium partners contracted by USAID included: PREDICT 2, with the University of California at Davis the prime contractor; OHW, with the University of Minnesota (the prime contractor) and Tufts University forming the Southeast Asia One Health University Network and One Health Central and East Africa Network; the Preparedness and Response Project, with DAI, Inc. the prime contractor; and WHO.

**Table 1: EPT-2 main stakeholders**

Stakeholder groups	Project examples
Government ministries and organizations	Ministries of agriculture and health, government research institutes, veterinary and health services
Universities and research centres	
Private sector	Poultry industries
Farmers	Rural farming households
International organizations	WHO, United Nations Children’s Fund (UNICEF), United Nations Environment Programme (UNEP), OIE
Specialized regional organizations	Association of Southeast Asian Nations (ASEAN), the South Asian Association for Regional Cooperation (SAARC), the Economic Community of West African States (ECOWAS) and the Economic Community of Central African States (ECCAS)
Non-governmental organizations (NGOs)	
Consumers	

Source: Review of project documents.

## 2.2 Theory of change

38. The M&E Unit for EPT-2 developed a narrative theory of change in late 2015 to assist the development of an M&E framework for the EPT-2 consortium (see Box 1). Viet Nam and Bangladesh also reported using a participatory approach to develop theories of change. These helped identify long-term goals and outcomes and guided programme activities.
39. To assess the logic of design, coverage, monitoring and outcomes as well as the assumptions and lessons learned in terms of moving from one outcome to another, the evaluation team reconstructed a more detailed theory of change in the inception phase. This was shared with EPT-2 staff for feedback over the course of the evaluation and changed accordingly several times. The first draft used the original EPT-2 SAFs, but had to be dropped after an observation that EPT-2 outputs and outcomes had been realigned to GHSA. The final version developed by the evaluation team is shown in Figure 5.
40. The theory of change describes an “if/then” logic of moving from one outcome to the next. The reconstructed theory of change was developed based on the three purposes of EPT-2 and some GHSA outcomes, as the two programmes are implemented concurrently.

**Box 1: Narrative theory of change for the EPT-2 consortium**

If there is better understanding of the viral and bacterial landscape at high-risk animal-human and animal-animal interfaces, as well as of the biological, ecological, behavioral and other epidemiological factors associated with the spill-over, amplification and spread of emerging pandemic threats, and if labs and surveillance detection mechanisms are strengthened and preparedness mechanisms are in place, we should expect improved risk mitigation at critical value-chain nodes and better outbreak response.

If faculty, students and professionals are adequately trained on core country prioritized One Health competencies and One Health programmes are available to students/professionals, we should expect strengthened workforce capacities, greater national buy-in into One Health education and, ultimately, a better-skilled generation of One Health-savvy implementers and decision makers.

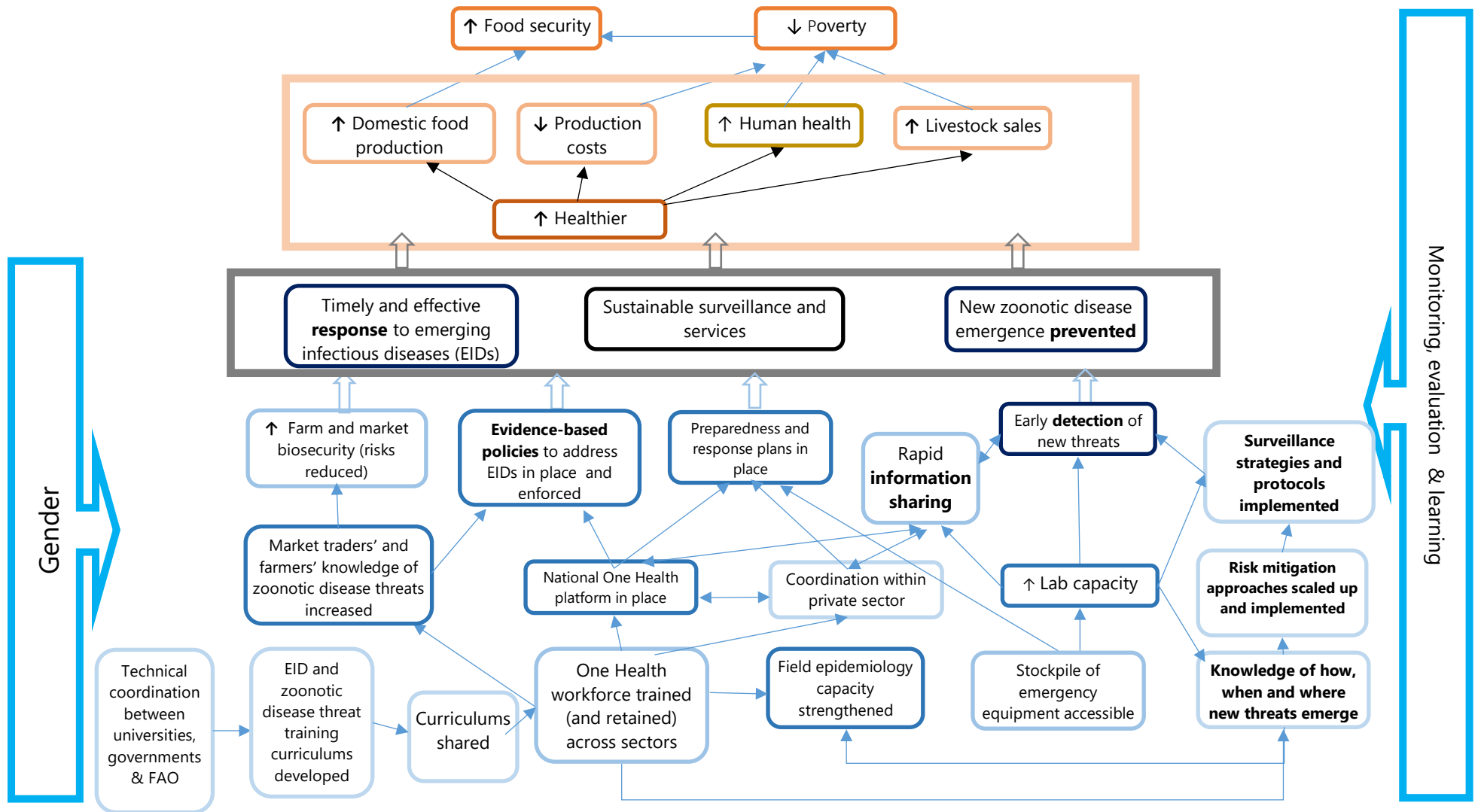
If there is sufficient evidence of the value of One Health policies and practices, if awareness is raised upstream (of policymakers on policies) and downstream (of communities on practices) and if national One Health coordination mechanisms are strengthened, we should expect a strengthened enabling environment for multi-sectoral collaboration.

*Source: Developed by the FAO M&E Unit.*

41. Gender and M&E and learning are issues that cut across the reconstructed theory of change. Key assumptions of the theory of change include the supposition that the three purposes of EPT-2 – the timely and effective control of zoonoses, the early detection of threats and the prevention of new zoonotic disease emergencies – support progress on the Sustainable Development Goals (SDGs) by improving the health of people (SDG 3) and livestock through more profitable farming practices (SDG 8) and, ultimately, reduce poverty (SDG 1) and increase food security (SDG 2). Furthermore, there is a key assumption in the theory of change that more profitable farming (increased livestock sales and reduced production costs) contributes to the sustainability of EPT-2-related services. This is partly down to the strengthening of the private sector and contributions to government tax revenue. Such outcomes and linkages are not measured by the EPT-2 programme. This evaluation does not attempt to assess these assumptions, but focuses on the outcomes and linkages highlighted in blue in Figure 5.



Figure 5: Reconstructed theory of change



Source: Evaluation team.

## 3. Findings

### 3.1 Relevance of EPT-2

**Finding 1. The evaluation found the EPT-2 objectives and One Health approach to be highly relevant. The importance and cost effectiveness of strengthening early detection, prevention and response to pandemic threats has been demonstrated many times, with the severe acute respiratory syndrome (SARS) outbreak of 2002–2003, swine flu in 2009–2010, Ebola virus disease in 2014–2016 and the current COVID-19 pandemic. The cost of COVID-19 to date dwarfs the investment in EPT-2. The COVID-19 pandemic was predicted, and the frequency of zoonotic disease outbreaks has been shown to be increasing. National, regional and global preparedness for pandemics urgently needs to be upgraded before the next spill-over event.**

42. Analysis of global health datasets shows the total number of human disease outbreaks and the proportion of those outbreaks caused by new diseases to be increasing over time. On average, one new or re-emerging infectious disease is seen in humans and animals every eight months. Out of the 1 400 microbes that could cause human infections, more than 60 percent are shared with wild or domestic animals (Taylor et al., 2001). Any microbe that is naturally transmissible from animals to humans is known as a zoonosis, and we now know that 75 percent of emerging human infections are zoonotic (Jones et al., 2008).
43. Between 1980 and 2013, 12 012 outbreaks of 215 human infectious diseases were recorded, comprising more than 44 million cases in 219 nations. Smith et al. (2014) found that after controlling for disease surveillance, communications, geography and host availability, the total number and richness (the number of unique causal diseases) of outbreaks had increased significantly since 1980 ( $p < 0.0001$ ) (Smith et al., 2014). The causes include advances in travel, trade and connectivity, which have not only led to increases in the volume and speed of travel of humans, animals and commodities, but also of zoonotic pathogens. There has been an unprecedented increase in unplanned urbanization, with millions of people living in crowded spaces and unhygienic conditions. Civil unrest and war have displaced large volumes of people, who have moved to new places, carrying with them a variety of infectious disease organisms. Also, global warming is creating new environments that are ideal for the spread of disease vectors (World Bank, 2017).
44. The likelihood of a significant coronavirus outbreak was predicted in 2007 (Cheng et al., 2007). The potential for the emergence of a highly infectious coronavirus similar to SARS-COV2, which allowed efficient replication in human-airway epithelial cell cultures from bat and animal coronaviruses, was predicted as recently as 2016 (Menachery et al., 2016).
45. Thanks to its work on HPAI and EPT1, FAO anticipated changes to disease dynamics in its publication *World Livestock 2013: Changing Disease Landscapes* (FAO, 2013). The review elaborated on persistent zoonoses threatening the food and income security of rural and livestock dependent communities and advocated for a paradigm shift in risk assessment and mitigation strategies that endorsed the One Health approach.
46. Investment in pandemic prevention is far less costly than response. The SARS outbreak of 2002 caused 8 422 known cases and just 916 deaths in 30 countries, but caused economic damage worth an estimated USD 40 billion (WHO, 2003). The Ebola outbreak in West Africa (2013–2016) wiped out preceding development gains in Guinea, Liberia and Sierra Leone.

In its most recent World Economic Outlook, the International Monetary fund estimated that as much as USD 25 trillion of economic output could be lost globally due to COVID-19 between 2020 and 2025 (IMF, 2020), in addition to the millions of people that will have lost their lives before a vaccine or treatment is developed. This, for a disease with less than 2 percent mortality, on average. By comparison, the World Bank estimates that prevention would require average per capita spending of just USD 1.69 annually to achieve an acceptable level of epidemic preparedness (WHO, 2019a).

47. In terms of EPT-2's internal relevance to FAO's mandate, most EPT-2 projects are designed to contribute to FAO Strategic Objective 5 and its constituent organizational outcomes 2 (through its HPAI and EPT1 work), Strategic Objective 3 (reducing the risk of threats at household and community level) and Strategic Object 4 (preparedness and response). The objectives, outcomes and outputs of EPT-2 are well aligned with SP5 outcomes.

### 3.1.1 Relevance at country level

**Finding 2. EPT-2 objectives are highly relevant at national level.<sup>9</sup> Low- and middle-income countries are the front line when it comes to emerging infectious disease and have seen increased capacity thanks to EPT-2 activities, particularly on avian influenza and Middle East respiratory syndrome Coronavirus (MERS-CoV). The ASL 2050 initiative has gained significant support in pilot countries, with requests for it to be scaled up to other countries and to regional level. The need to address public health threats at the country-level human–animal–environment interface makes the One Health approach highly relevant and appropriate to organizing multisectoral collaboration and technical resources. EPT-2 AMR work in Asia has gained major traction amid strong national political will to address the issue and made a significant contribution to global AMR efforts.**

48. HPAI Asian (H5N1) viruses have evolved rapidly since they were first identified in 1997. Human infection with the influenza A (H7N9) virus was first reported in China in 2013 and sporadic epidemics have been reported ever since. Most human cases have reported recent exposure to live poultry or potentially contaminated environments, especially markets where live birds are sold. This virus does not appear to transmit easily from person to person and sustained human-to-human transmission has not been reported. However, as the viruses are always changing, vigilance is needed to assess how genetic changes affect the spread from person to person and their susceptibility to antiviral drugs.
49. HPAI remains a real threat in Africa and Asia. Cameroon, Ghana, Nigeria and Uganda experienced outbreaks between 2015 and 2019. Except for Egypt, where the disease remains endemic, all countries were able to stamp out the outbreaks with EPT-2 assistance. The outbreaks that occurred in Nigeria in 2015, before EPT-2 was fully operational, were more difficult to control due to a lack of external support, causing the disease to spread to many areas of the country. In Asia, overall country capacity to combat HPAI has been improved by long-term FAO support, but it remains rife in many countries, including Bangladesh, China, India, Indonesia and Viet Nam. These countries need continued assistance to mitigate the impact of endemic infection and to combat new clades and sub-clades of H5N1 and novel influenza A viruses as they emerge. The evaluation noted a

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<sup>9</sup> As mentioned, the objectives of the EPT-2 programme are: (1) to prevent, detect and respond to epidemic zoonotic threats in a timely manner; (2) to raise the capacity of the One Health workforce; and (3) to enable multisectoral collaboration around pandemic threats.

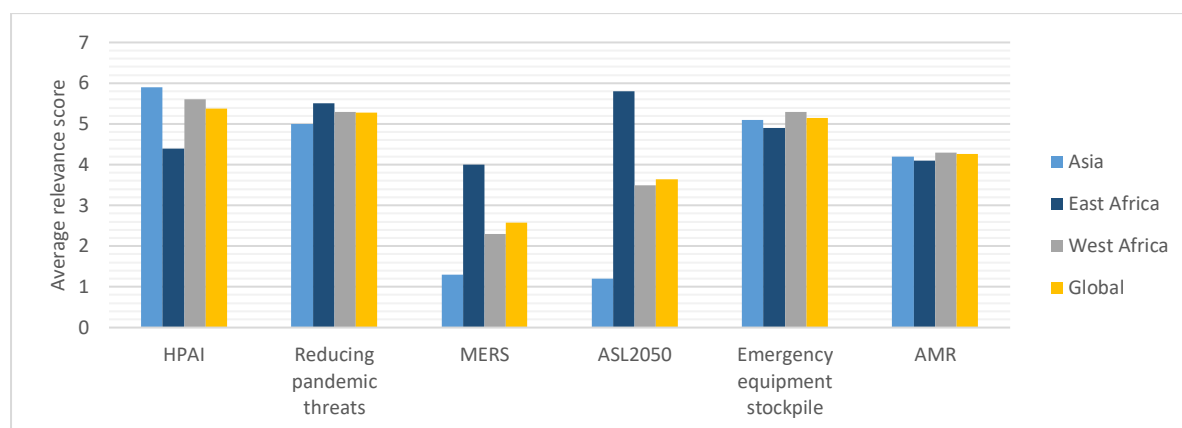
high level of fatigue and complacency at national level when it came to managing HPAI, underscoring the need for EPT-2 advocacy on the pandemic threat it poses.

50. MERS-CoV is one of the high-threat pathogens included in the WHO R&D Blueprint (WHO, n.d.), which provides a roadmap for the research and development of diagnostic, preventive and therapeutic products for the prevention and early detection of and response to threats caused by a list of 11 high-priority pathogens. It is an emerging disease that poses serious threats to human and camel populations. The 2015 South Korean MERS outbreak resulted in more than USD 1 billion in lost economic activity, more than 16 000 people quarantined, 186 cases and 38 deaths (World Bank, 2017). Thailand was able to detect the presence of the disease early on thanks to its surveillance infrastructure and only saw three cases (World Bank, 2017). The Korean outbreak shows why MERS-CoV deserves serious study so that we can better understand the disease and build countries' capacity for surveillance, diagnosis and control.
51. In those countries where EPT-2 supported MERS-CoV activities, the programme was deemed to have made an essential contribution to science, health and livelihood security. The concern in Kenya, Ethiopia and Egypt not only related to possible deaths from the disease, but to disruption to the camel trade. Trade in camels, camel meat and milk has been growing in recent decades (Faye, 2014).
52. ASL 2050 has given six governments and national stakeholders the opportunity to consider livestock trends and forecasts. Drawing on lessons learned in Asia, ASL 2050 has formed an important foundation for rethinking institutional and policy landscapes that could forestall unfavourable socioeconomic, public health, security and environmental scenarios associated with the livestock sector. Poultry producers in Nigeria and Egypt, for instance, are already experiencing some of the negative effects of rapid growth in the sector. Both countries are in the process of reviewing their policies to ensure the sustainable transformation of their poultry sectors and reported finding real value in the work done through ASL 2050.
53. The overarching One Health approach applied across EPT-2 has supported countries in organizing multisectoral collaboration and technical resources against public health threats at the human–animal–environment interface. This has prompted countries, particularly in Africa, to augment their public and animal health systems by pooling both technical and material resources for the early detection, prevention and control of zoonotic diseases. The value of embracing a multi-sectoral approach, as espoused by the One Health approach and set out in the FAO One Health Action Plan (FAO, 2011), is beginning to yield results in some countries. The Zoonotic Diseases Unit in Kenya is an example of how collaboration between animal and human health systems has improved surveillance, early detection, prevention and response to zoonotic disease threats. For example, it organized livestock vaccination programmes against Rift Valley fever (RVF) when FAO forecast the likely emergence of the disease, while human health officials simultaneously conducted community education. This forestalled RVF outbreaks in 2016.
54. AMR has been recognized as a major threat to human health and animal production in Asia, where all EPT-2 countries are developing national action. The threat from AMR is considered particularly severe due to Asia's high use of antimicrobials in humans and animals and, increasingly, in aquaculture. A massive increase in livestock production in Asia under sub-optimal husbandry and hygiene conditions has resulted in very high rates of

antimicrobial usage (AMU), with few controls. Initial in-country studies have shown very high levels of multi-resistance in indicator species, including against WHO-listed critically important antimicrobials. In addition, though antimicrobial growth promoters have now been banned in most countries in the region, it is understood that significant volumes are still being used prophylactically and to boost production levels. The poor stewardship and overuse of antimicrobials in livestock production urgently needs to be addressed.

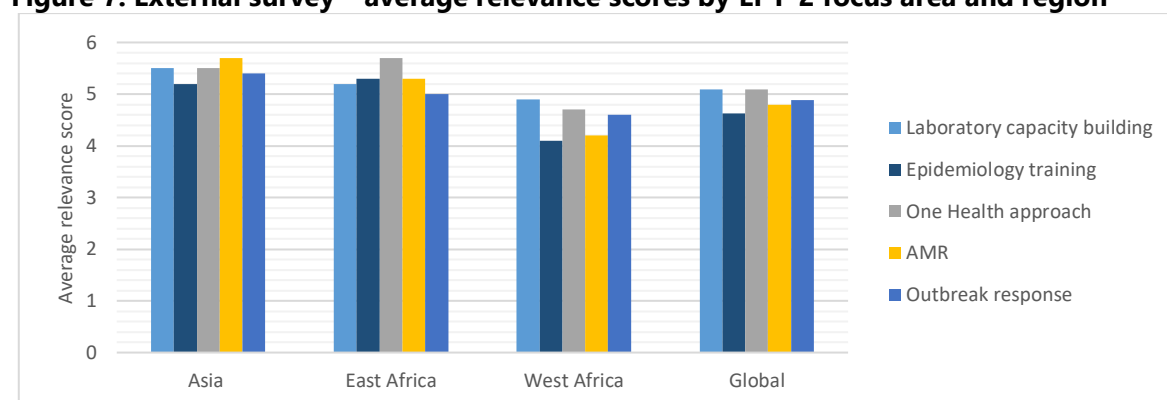
55. EPT-2 scored highly on its components and focus areas in both the internal and external surveys in countries the evaluation team did not visit. Figures 6 and 7 present the average regional scores on a scale of one to six, with six being the highest. Components such as MERS and ASL 2050 focused specifically on East Africa, explaining the low relevance scores in other regions in Figure 6.<sup>10</sup> In the external survey, so as not to confuse respondents with terminology, relevance scores were given by key focus area (Figure 7). The differences in score at the global level across the EPT-2 focus areas are not statistically significant,<sup>11</sup> but testify to the perceived importance of animal health diseases more generally at the national level.

**Figure 6: Internal survey – average relevance scores by EPT-2 component and region**



Source: Evaluation team.

**Figure 7: External survey – average relevance scores by EPT-2 focus area and region**



Source: Evaluation team.

<sup>10</sup> Burkina Faso and Nigeria were also targeted through the ASL 2050 programme, but Nigeria was not surveyed, as it was one of the countries the evaluation team visited. ASL 2050 received high scores in terms of relevance by respondents in Burkina Faso.

<sup>11</sup> Calculated at the 5 percent significance level.

### 3.1.2 Relevance at regional level

**Finding 3. Regional collaboration and a harmonized approach to the surveillance of and response to cross-border zoonotic disease outbreaks and AMR has significant advantages for Members. EPT-2 is, therefore, highly relevant at regional level. FAO support for RECs has been both necessary and appropriate.**

56. Recent regional zoonotic disease outbreaks (avian influenza, MERS, RVF and COVID-19) have shown that regional pandemic preparedness is a public good, as infectious diseases do not respect borders. Furthermore, it is cheaper to develop high-level expertise at the regional level rather than at individual country level. The Ebola virus disease outbreak in West Africa in 2014–2015, for example, not only exposed weaknesses in the public health surveillance, preparedness and response systems of the three affected countries, but also emphasized the importance of regional collaboration and underscored the need for a more harmonized approach to disease surveillance and response for potential cross-border disease outbreaks. The Ebola epidemic began in Guinea, but rapidly spread to neighbouring countries. Containment was hampered by the absence of systematic collection, reporting and exchange of surveillance and laboratory data across national borders in real time (World Bank, 2017).
57. Countries have recognized the relevance of a regional approach and most RECs have published One Health ministerial communiqués in this regard with FAO and EPT-2 support. For example, in November 2016, the ministers of health, livestock, environment and agriculture of ECOWAS pledged to work towards implementing a regional One Health strategic framework to improve health. ASEAN established platforms to link sectoral and technical working groups in the livestock sector with those in the human sector. SAARC developed a similar approach.
58. There is also evidence that regional initiatives are effective in adding value to disease prevention and AMR surveillance. Regional disease surveillance networks add value to global disease detection and response by complementing other systems and efforts, by harnessing their power to achieve other goals, such as health and human security, and by helping countries adapt to complex challenges via multi-sectoral solutions (Bond et al., 2013). Intergovernmental commitment and trust is critical to the success of regional infectious disease and AMR networks. Once established, it can be used to set regional standards that assist member states in making investment decisions and commitments. It was noted that FAO's Regional Conferences, for example, the FAO Regional Conference for Asia and the Pacific, enable relevant ministers to agree regional agriculture priorities. The Africa Centre for Disease Control and Prevention (Africa CDC) is a relatively new regional initiative. The World Bank recently approved a total of USD 250 million in International Development Association (IDA) credits and grants to help Ethiopia, Zambia and the African Union to counter the spread of infectious diseases and to address key regional and continental public health issues. The Bank noted "effective disease surveillance and response mechanisms are a regional public good and stemming the spread of epidemics will have highly positive social and economic spillover effects on countries across Africa" (World Bank, 2019b).

### 3.1.3 Relevance and appropriateness of the EPT-2 design and approach

**Finding 4. While recognizing the relevance of EPT-2 outputs and its very strong focus on capacity development, the evaluation team found engagement with senior policymakers on pandemic preparedness and the need for counterparty investment to be insufficiently strong features of programme design.**

59. Despite growing international attention on the problem of pandemic threats in the wake of the HPAI and SARS epidemics and, more recently, the Ebola disease virus epidemic in West Africa and COVID-19, many countries remain unprepared to deal with infectious threats. At a minimum, countries need a sound policy with solid legal and regulatory foundation, an adequately trained and equipped OHW, a strong surveillance and response framework, functional national public laboratories and robust multi-sectoral coordination. Many of these components fall under the auspices of different parts of government and are often financed through various mechanisms, from emergency allocations and routine sectoral provisions to ad hoc apportionments. EPT-2 has made some progress on addressing this complexity through key partnerships, but there was little to no evidence of consistent engagement or support for government decision makers or significant policy change. This was not a key objective of the original programme design, however, which targeted lower-level outputs and outcomes.

**Finding 5. The EPT-2 programme has been agile and adept at adjusting its approach and thematic focus to align with emerging needs and changes in national priorities.**

60. EPT-2 shifted its focus fairly quickly from Ebola virus disease in Africa to priority endemic zoonotic diseases and other reported emerging diseases, such as avian influenza and MERS-CoV, which are important to both national governments and agricultural stakeholders. In Asia, recognizing the vital role of One Health in addressing AMR and preparing Asian countries to address the issue, AMR was added to EPT-2's activities. Similarly, realizing that key lessons on livestock development in Asia could potentially be applied to Africa, the ASL 2050 project began to flag policy and institutional issues that African countries needed to consider. Both initiatives have proved popular and relevant.
61. In the field, EPT-2 staff and resources, including laboratory time and equipment to support the control of epizootics, have been used to tackle other disease outbreaks in certain countries, such as African swine fever and peste des petits ruminants (PPR). These are not directly targeted by the programme, demonstrating a certain degree of flexibility.
62. Furthermore, the incorporation of EPT-2 SAFs into the GHSA in 2015/16 allowed greater flexibility of design. Overall, FAO appears to have effectively managed the two programmes to ensure complementarity. GHSA action packages (see Box 2) are broad, allowing EPT-2 to provide additional support to certain lead countries in Asia (Thailand, Indonesia and Viet Nam) and simultaneously work knowing that unbudgeted activities, such as epidemiological field training and AMR work in Africa, can be funded through separate GHSA funding. Thus, GHSA phase 1 countries complemented EPT-2 coverage.

**Box 2: FAO GHSA initiative**

Through the USAID-funded GHSA programme, FAO is helping 17 countries in Africa and Asia to improve their capacity to prevent, detect and respond to threats of disease, using a multi-sectoral One Health approach, linking human, animal and environmental health. Priority zoonotic diseases have been identified by animal and public health professionals in each country, assisted by the CDC Prevention Prioritization Tool and other USAID implementing partners.

Missions in each country have determined the current capacity level, using the GHSA JEE tool, which is now being used to build action plans and self-assess progress.

The FAO GHSA programme contributes to the GHSA – a growing partnership of over 60 countries, NGOs and international organizations that aims to create a world safe from infectious disease threats and elevate global health security to a national and global priority.

All GHSA member countries participate in one or more of the 11 'action packages', which are areas of work and specific sets of actions to urgently establish global capacity to prevent, detect and rapidly respond to infectious disease threats. The FAO GHSA programme focuses on the following five action packages,<sup>12</sup> where it has a strong comparative advantage in implementing and supporting the country-driven prevention and detection of zoonotic diseases:

1. AMR
2. zoonotic diseases
3. biosafety and biosecurity
4. national laboratory systems
5. workforce development

**3.1.4 FAO's comparative advantage on animal health issues**

**Finding 6. The evaluation team found FAO to have a significant comparative advantage in supporting countries and regions in their fight against infectious animal diseases, including emerging and re-emerging zoonoses with epidemic and pandemic potential. EPT-2 drew on many of these advantages.**

63. The 2012 144th Council Session outlined FAO's attributes, core functions and comparative advantages in relation to the global challenges facing the Organization (FAO, 2012). Many of these attributes were noted in EPT-2, including:
- i. FAO's field presence and diverse technical capacity allow it to mount joined-up global responses, linking global monitoring, international legislative instruments and forums for discussion, resource mobilization and coordination.
  - ii. FAO's science-based approach to assessing risks and developing solutions is significant. It has a diverse pool of technical experts and a network of reference laboratories and is able to mobilize international scientific experts across the agrifood system, making sure that the latest scientific information is shared in a timely manner, is used to build capacity at different levels and that scientific experiments reflect information needs and address knowledge gaps.
  - iii. FAO's independence and transparency allow it to act as an honest broker between international development partners and member states in crisis situations. FAO has

<sup>12</sup> FAO Viet Nam also supports GHSA action packages on risk communication and national reporting systems.



- global networking capacity with convening power to facilitate policy and strategy dialogue, as well as the negotiation of agreements and decision-making among Members and between RECs, governments and other stakeholders.
- iv. FAO's Tripartite partnership with OIE and WHO gives it access to technical and institutional resources and an opportunity for knowledge sharing and cross-fertilization that is necessary to influence policy and ensure technical delivery across the environment–human–animal health nexus.
64. Notably, since HPAI H5N1 first emerged in Asia, FAO has played a leading role in coordinating actions to support countries in addressing the problems and mitigating the impacts on human health and poultry production. This role has been consolidated and broadened with subsequent efforts (EPT1/ETP plus). FAO has effectively transferred key technical staff from Asia to Africa to support the establishment of EPT-2 and GHSA there. Key informants from government technical ministries were unanimous in their view that FAO was the correct organization to support them because of its long-term partnership, technical expertise and on-the-ground capacity.

## **3.2 Results and effectiveness of the EPT-2 programme**

### **3.2.1 FAO's contribution to prevention, detection and response systems**

65. The evaluation confirmed that capacity to address pandemic threats in Africa and Asia was significantly different. To achieve its first objective in Africa, EPT-2 embarked on an initiative to boost the ability of selected countries to detect, prevent and respond to disease outbreaks. This dovetailed with the GHSA project on the continent. In Asia, the programme worked at a more advanced level, training, refining and upgrading strategies developed over a longer period, dating back to the emergence of HPAI in 2005.

**Finding 7. *Africa*: The evaluation found that EPT-2 effectively raised the capacity of target countries to pre-empt and respond to emerging zoonotic diseases threatening human health and to support the control of other (non-zoonotic) livestock diseases.**

66. Numerous examples of successful prevention activities were found, including structured epidemiological training, clear One Health approaches, value-chain and risk analysis, market profiling, farmer training and vaccination. Disease detection was supported at country level, by strengthening laboratories, risk mapping, disease reporting and surveillance, albeit primarily active surveillance.
67. In several African countries, outbreaks of HPAI were controlled, while standard operating procedures for selected disease investigation and national preparedness plans were developed; they continue to be upgraded. However, much of the detection work in Africa has yet to become sustainable and the evaluation found little evidence of cost recovery or public–private partnerships. This was not overly worrying considering the nascent stage of the development of animal health services in most African countries.
68. Furthermore, it is important to note that expertise and capacity gained in Africa through EPT-2 has also been utilized for non-zoonotic disease control, such as PPR, African horse sickness, contagious bovine pleuropneumonia (CBPP), African swine fever, salmonellosis and foot-and-mouth disease (FMD).

**Finding 8. Asia: The evaluation found significant examples of EPT-2 continuing to build a solid foundation for disease prevention, detection and response through refinement, policy and institutional strengthening, plus the introduction of new tools and technologies.**

69. Overall prevention capacity appears to have been strengthened through continued value-chain analysis, which has been translated into training and improved biosecurity at certain markets and among farmers. EPT-2 has been developing tools, such as the Market Profiling Application (MPA), to help scale up market support. Vaccination effectiveness has improved thanks to virus characterization and efficacy testing.
70. Disease detection remains poor, though some training in outbreak investigation has taken place and surveillance is largely confined to active surveillance (such as at live bird markets), despite strong or significantly improved laboratory capacity. This includes diagnostic capacity, technology, biosafety, quality assurance, equipment, accreditation, twinning and collaboration in most countries. The Laboratory Mapping Tool (LMT) has consistently and effectively bolstered laboratory functionality. The importance of the One Health approach to early detection was recognized and strongly supported. It appeared to be gaining traction through the initial use of joint risk assessments (JRAs), as well as growing wildlife and environment partnerships in specific countries. The Field Epidemiology Training Programme for Veterinarians (FETPV) remains a key tool in strengthening the One Health approach, but lacks consistent coordination with equivalent health-sector programmes.
71. Response capacity was strengthened, with disease control and preparedness plans for selected diseases put in place, complemented by field staff training. The lack of effective compensation schemes was still a major challenge for the efficient detection and control of diseases, such as avian flu. An additional innovation of EPT-2 in Asia has been the surveillance, capacity development and awareness-raising work associated AMR.

### **3.2.1.1 Avian influenza**

**Finding 9. Although EPT-2 bolstered outbreak response in some countries, avian flu is not yet under control in endemic countries, as efforts rely on national commitment to scale up initiatives. Thanks to EPT-2, early detection of new outbreaks has improved, but remains challenging in countries that are unable to incentivize farmer reporting due to a lack of robust policy support. Laboratory capacity has continued to improve in all targeted countries.**

#### **Endemic avian influenza countries**

72. The EPT-2 programme built on previous work commissioned through HPAI, EPT-plus and EPT1 projects from 2004. However, the endemic status of avian influenza in Egypt and certain countries in Southeast Asia did not change significantly throughout EPT-2. HPAI endemicity is associated with insufficient commitment to invest in poultry-sector transformation, passive surveillance and other detection systems and the tracing and effective response mechanisms needed to reduce prevalence and control the disease. Even without the necessary investment and associated policy change, however, countries have benefited from practical EPT-2 support for their risk-analysis strategies, maintaining awareness, staying abreast of virus mutations, supporting virus characterization and vaccine efficacy testing and putting in place national preparedness plans with simulation exercises and outbreak investigation training. Thus, EPT-2 has created a solid foundation for future control in endemic countries if the political will to invest materializes.

73. FAO appears to have gained good understanding of why countries remain endemic through a series of longitudinal endemicity studies,<sup>13</sup> however, the evaluation was unable to find evidence of high-level advocacy for investment in avian influenza endemic countries and noted that activities to support such engagement were not included in programme design. The outputs of recent endemicity studies are to be used to generate recommendations for policymakers to improve the control of HPAI in endemic countries.
74. Though the need for the timely reporting of outbreaks is recognized by veterinary services as crucial to effective response in endemic countries, there appears to be insufficient high-level support in government, with limited programmes to promote public awareness, to provide compensation and to support effective disease control. For instance, in large, decentralized countries, such as Indonesia, passive surveillance remains poor, with lengthy delays in reporting and investigating disease outbreaks. Such delays make it more likely that the response will fail, and the disease will remain endemic.
75. In the face of endemicity in Egypt, EPT-2 initiated the Exposure Reduction Programme (ERP) for safe poultry slaughtering at household level. Significant ERP communication materials aimed at schools, farmers, healthcare clinics, youth centres, veterinary clinics and agrovet stores were developed and seemed to be effective. FAO's post-campaign monitoring showed that 87 percent of survey respondents were aware of the campaign, 61 percent accepted the ERP messages and 43 percent correctly took appropriate steps.

## Prevention

76. Avian influenza risk assessments have played a key role in prevention, with a view to identifying key infection targets for more efficient detection and more effective response. Targeting has focused on value-chain mapping, the use of live bird-market sampling for monitoring and programmes to improve market hygiene, with stepped-up surveillance in selected border areas (Viet Nam, the Lao People's Democratic Republic and Nigeria). Numerous qualitative risk assessments, analyses and guidance have been published on avian influenza topics of concern (see, for example, FAO, 2016c; 2018a; 2019a). In addition, cross-border collaboration has increased, with bilateral meetings between Viet Nam and China, the Lao People's Democratic Republic and Cambodia improving information sharing and leading to better understanding of cross-border trade.
77. FAO headquarters-based risk-assessment facilities, combining GLEWS coordination with funding from the United States' Defense Threat Reduction Agency (DTRA) and Regular Programme, effectively supported country efforts to prevent outbreaks. For example, following detection of HPAI on migratory bird corridors in Russia in 2016, FAO alerted relevant African governments to increase surveillance and convened a global webinar attended by 30 countries to discuss implications and review expert recommendations. The virus appeared where FAO had forecast in 2017, but countries such as Sierra Leone and Senegal were able to update their preparedness plans and test migratory birds.
78. High-biosecurity model poultry farms were developed in Indonesia, Bangladesh and Viet Nam, with a formal cost-benefit analysis undertaken in Indonesia to demonstrate the advantages of the approach. The model farms, supported by staff training and materials,

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<sup>13</sup> FAO conducted endemicity studies to determine key factors in the year-on-year persistence of avian influenza in both Bangladesh and Indonesia.

including training of trainers, provide practical and financially appropriate approaches to reducing the risk from poor-biosecurity poultry production. In Bangladesh, for example, the national U2C (*upazila* to community)<sup>14</sup> initiative is providing the foundation for disease prevention by introducing better farm biosecurity and hygiene practices. Sadly, the exchange of information on strategies adopted and activities undertaken was limited between the three most severely affected countries, Indonesia, Bangladesh and Viet Nam. Overall, the evaluation found that the model farms had not been widely replicated, with little emphasis on extension activities, so had limited impact on the actual risk of infection. For this to happen, the model needs to be scaled up nationally through local investment.

79. Some countries, such as Viet Nam and Bangladesh, have improved information systems by establishing national farm databases. These act as the foundation for effective surveillance, boost awareness of the need for disease reporting and present an opportunity to develop risk-based surveillance programmes. At the time of the evaluation, the Market Profiling Application (MPA) was also being developed and tested to provide collection and analysis of epidemiologically relevant market data in situations of limited resources. These data were used to support the selection of markets where a portable polymerase chain reaction (PCR) diagnostic system might be introduced. The MPA was reported to have profiled around 500 live bird markets and mapped more than 1 000 trade connections. These efforts form a useful basis for future prevention efforts and the detection of avian influenza and other zoonotic disease threats.
80. Considerable efforts have also been made to improve hygiene at live bird markets, with the development of guidelines, standard operating procedures for cleaning, disinfection and destocking, staff training and programmes to increase trader awareness. These are all important steps in preventing outbreaks and minimizing the spread of the disease. However, as market infrastructure typically remains poor (permeable surfaces, poor access to water, inappropriate waste disposal, etc.), there is little ability to effectively reduce the prevalence of influenza viruses in markets until additional investment in market infrastructure is made by local authorities and/or market traders. Efforts to improve live bird markets were also noted Ghana and Nigeria. Ghana went as far as to require movement permits for poultry destined for live markets, but the level of compliance was not clear. Sampling at live bird markets is of limited value until there is capacity to trace back along the supply chain to address infection reservoirs in the field.

## Detection

81. Early detection of cases remains a concern in all countries visited. Rigorous national response policies (culling, disposal, cleaning and disinfection), quarantine and movement restrictions often result in a loss of community and farmer support, undermining early reporting of disease outbreaks. The EPT-2 programme's drive to increase awareness of the need for early reporting has not mitigated the problem and may even have led to the increased movement of sick animals and greater risk of onward transmission. Once again, the absence of institutional oversight and robust policy to support effective, appropriate, and timely compensation in countries continues to hamper disease reporting and effective response. These challenges have such serious impacts that Nigeria, for instance, is thinking of alternatives to government-led compensation for poultry killed for disease control.

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<sup>14</sup> The *upazilas* are the second-lowest tier of regional administration in Bangladesh. The administrative structure consists in fact in divisions (8), districts (64) and *upazila* (491).

Through EPT-2, FAO tried to rally support for alternatives to compensation by promoting an insurance scheme. Unfortunately, the initiative did not take off, as EPT-2 activities in Nigeria were curtailed in July 2019 before it could be implemented.

82. Despite these challenges, the evaluation found numerous examples to support the finding that early detection of new avian influenza outbreaks had improved. These included the early detection of H5N8 in live bird markets and the effective use of the Community Animal Health Outreach programme in Egypt and the U2C programme in Bangladesh, both of which used a 'participatory disease surveillance' approach.<sup>15</sup>
83. Monitoring avian influenza in endemic countries is based on active, targeted surveillance, primarily in major live bird markets. Though valuable for monitoring viral changes, such an approach is not suited to widespread disease detection. It is a practical use of limited EPT-2 resources until countries fund broader passive surveillance. Passive surveillance-related training on disease reporting, updated case definitions and the creation of standard operating procedures for HPAI control activities were conducted in most countries. This is only sustainable, however, if governments invest to extend the system over time.
84. The EPT-2 programme directly supported the development of surveillance information management systems in Bangladesh and Viet Nam, which are now being scaled up. Indonesia developed a national animal health database (iSIKHNAS) and a One Health information-sharing platform (SIZE). In all three countries, these systems present a huge opportunity for improved flow of timely and reliable data. The systems should in time allow access and analysis at local, sub-national and national level, as well as real-time decision-making on emerging animal health issues and improved monitoring and implementation of control programmes. Interviewees raised concerns over (1) the commitment of field staff to inputting data, (2) the structure and utility of the database and (3) the ease of reporting; review and development are ongoing. Significant work remains to be done to ensure national databases are fit for purpose.
85. Detection and reporting systems in Africa are less advanced, giving FAO an opportunity to introduce appropriate technology. EPT-2 was instrumental in rolling out the Event Mobile Application (EMA-i)<sup>16</sup> to enhance animal disease reporting systems in Côte d'Ivoire, Ghana, Guinea, Mali, Uganda and the United Republic of Tanzania, with plans for its rollout using GHSA funds to the Democratic Republic of the Congo, Liberia and Sierra Leone. EMA-i allows animal health workers to report real-time geo-referenced animal disease data to FAO's Global Animal Disease Information System (EMPRES-i) database at country level, where it can be validated and assessed. The app has the potential to enhance early warnings of animal disease occurrence at national, regional and global levels. Between 2016 and 2019, for example, a total of 5 930 animal disease events were reported using

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<sup>15</sup> Government *upazila* staff have been trained in community participatory methods and have engaged with local smallholder communities to identify priorities, promote improved husbandry practices (including the increased use of vaccines and reduced use of antimicrobials) and to increase awareness of disease outbreaks and the need to report. Nationwide U2C training has now covered all 492 *upazilas* in the 64 districts in Bangladesh. The programme has reportedly increased contact between state veterinary staff and communities and has improved passive surveillance and outbreak detection, but it is too early to say whether there has been an increase in disease reporting or more timely responses to avian flu. It has led to the detection of the first incidence of rabies in many years and the first ever detection of lumpy skin disease, spurring vaccination control programmes.

<sup>16</sup> EMA-i and EMPRES-i were developed by NSAH/GLEWS before EPT-2 started, with funding support from Ireland, DTRA and FAO regular programme budget.

EMA-I in the six African countries. Among them, 3 524 (14.5 percent priority zoonotic diseases) were validated by the central veterinary offices of the countries in question, spanning 81 national notifiable diseases. In Ghana, for example, EMA-i contributed to the timely reporting of African horse sickness in Accra in 2019. In Guinea, EMA-i aided the punctual reporting of PPR, which triggered a rapid response, leading to laboratory confirmation.

86. The fundamental infrastructure required for detection and surveillance is the laboratory. Thanks to EPT-2 support, the main national laboratories in targeted countries can now be considered highly competent in diagnosing and characterizing various levels of avian influenza. The support and inputs provided by EPT-2 focused mainly on targeted training and mentoring, equipment and reagent supply, as well as support for laboratory staff participation in proficiency testing and certification programmes, including twinning with international reference laboratories. National laboratories in countries receiving longer-term support, such as Bangladesh, Viet Nam, Indonesia and Egypt, were found to be able to characterize virus samples and test vaccine efficacy, while laboratories in countries such as Myanmar and the Lao People's Democratic Republic still used reference laboratories. In Africa, where laboratory capacity is less advanced, FAO spearheaded a drive for laboratories to gain certification to comply with International Air Transport Association (IATA) regulations on the transportation of infectious materials. Quality management systems have been established in the main national and regional laboratories and a number have now been accredited to ISO 17025.
87. The LMT was also used to assess the capacity of national laboratories and identify necessary improvements in testing and biosafety capabilities. The findings in core LMT scores guided capacity-building programmes, in addition to the supply of consumables and testing kits. In several instances, laboratory management systems were also supported with the introduction of accredited information management systems (such as SILAB) or the development of novel, home-grown information management systems.

## Response

88. Avian influenza outbreaks were reported in numerous African countries between 2015 and 2019. Over this period, national capacity to investigate and respond to outbreaks improved thanks to EPT-2 support. For example, the outbreak of a new H5N8 strain in the Plateau and Bauchi States of Nigeria in 2019 was detected before it could spread and was stamped out thanks to Programme support. This contrasts sharply with the outbreaks (H5N1) that happened in 2015, prior to EPT-2 implementation, which were detected late and ended up spreading to many states and farms, resulting in serious losses across the country and in neighbouring countries. Similarly, in Asia, through EPT-2, the ECTAD regional team in Bangkok was able to lend emergency support to the Government of the Philippines in 2017 to contain the spread of H5N6 avian influenza and to conduct post-outbreak surveillance (even though the Philippines was not an EPT-2 target country).
89. In several African countries, EPT-2 contributed to improved outbreak response through table-top simulation exercises on the management of avian influenza outbreaks. Participants included ministries of livestock and fisheries, environment, health, technical partners and poultry farmers' associations. The simulations identified gaps in national contingency plans and standard operating procedures. They were supported by numerous Good Emergency Management Practices (GEMP) training sessions, which were reported to

have increased overall awareness of veterinary services to better prepare, prevent, detect and respond to animal diseases through the implementation of emergency management plans. They also highlighted the importance of using a One Health approach to zoonotic diseases, along with multi-sectoral coordination. Combined, these initiatives, were reported to have improved outbreak response capacity in Africa.

90. Improved understanding of the circulating virus types and the adjustment of vaccine seed strains have improved vaccination programmes in avian influenza endemic countries. Vaccination is now routinely used in most higher-value, longer-lived flocks (grandparent, parent stock and layers) and large commercial farms, but not in shorter-lived birds (broilers). This appears to have reduced disease incidence, as evidenced by national disease outbreak reports to OIE.
91. In several countries, including Egypt, Bangladesh, Indonesia, Nepal and Viet Nam, regular vaccination was accompanied by EPT-2-led outbreak investigation and response training. Immediate post-course assessments suggested that these courses were very valuable and had led to improvements in outbreak investigation and response – though this has not been validated over time. In addition to staff training, the EPT-2 programme promoted awareness of the need to report and develop standard operating procedures for investigation and response. This should lead to more effective and more timely outbreak responses. Countries' ability to impose quarantine and control animal movements is limited, however, and it is difficult to ensure the efficacy of the decontamination process on infected properties. In live bird markets, influenza viruses are commonly detected in all endemic countries, despite market hygiene programmes.

### **3.2.1.2 MERS-CoV**

92. MERS-CoV projects (another EPT-2 component) were implemented in Egypt, Jordan, Kenya and Ethiopia. They did not follow the normal “prevent, detect and respond” profile, as the disease epidemiology and risk were still being ascertained. The main objectives were to improve understanding of the new disease and to build laboratory capacity to detect it.

#### **Finding 10. The EPT-2 programme facilitated regional cooperation for better understanding, surveillance and detection of MERS-CoV in targeted countries.**

93. With funding from OSRO/GLO/505/USA, there has been significant capacity development at national and regional laboratories. EPT-2 brought countries and stakeholders together at an early stage (in 2015) to develop MERS-CoV risk-based, cross-sectional and longitudinal surveillance plans, which have been updated annually and implemented. In the targeted countries, animal health staff received training on field sampling (the sampling technique for camels is relatively difficult and has continued to be improved and refined through EPT-2). Sampling has been linked to value-chain studies and risk assessment and has included non-camelid species, such as cattle, donkeys and shoats. The asymptomatic nature of the disease in camels posed challenges to the MERS-CoV work. Herders were reluctant to allow sampling of apparently healthy camels in Kenya. EPT-2 staff worked with the Kenya Camel Association and community representatives to link sampling with general herd health management support and ensured timing was mutually convenient. Consequently, samples were successfully collected for cohort studies. High seropositivity has been found across the camel population, though with variation according to season and the age of the camel.

94. Through EPT-2, laboratories were supported in and equipped for the adoption of testing protocols, particularly enzyme-linked immunosorbent assay (ELISA) and real-time PCR testing. Full genome sequencing of two PCR-positive samples by the University of Bonn confirmed that the MERS-CoV virus circulating in Kenya was non-zoonotic (Clade C), similar to clades identified in Egypt and Nigeria. Results from sampling in Jordan suggested the presence of a latent form of infection in camels, the implications of which have yet to be fully investigated. Veterinary laboratories in the region lack the capacity to carry out viral sequencing and diagnostics. However, the sequencing and phylogenetic analysis of MERS-CoV collected in Kenya and Egypt showed that the circulating virus was distinct from that in the Middle East. This knowledge has helped to protect camel value chains, trade and livelihoods. Regional camel value-chain analysis also helped to identify areas or practices at greatest risk of MERS-CoV amplification, spread and spill-over. This information is vital to informed decision-making on risk-reduction measures targeting camels and people.
95. Thanks to EPT-2's support, regular surveillance has been established in Egypt, where all imported camels must now be tested. Ethiopia drew on MERS-CoV as a reason to strengthen the country's Animal Diseases Notification and Investigation System, including the development of a real-time SMS-based reporting system, which has resulted in increased reporting rates for both zoonotic and non-zoonotic diseases. Mapping of the potential amplification and transmission hotspots in designing and implementing the risk-based MERS-CoV cross-sectional surveys in Kenya enabled seven PCR-positive camels to be detected for the first time in Kenya.
96. The MERS-CoV initiative through EPT-2 effectively used a One Health approach to avail of new knowledge at national level and across the region. Additional work is still required to fully understand the epidemiology of the disease and to inform policy actions based on scientific evidence, to ensure long-term surveillance and protection from the disease. For example, in Kenya, with FAO support, the Director of Veterinary services established a MERS-CoV Technical Working Group (MTWG) through the Zoonotic Disease Unit (ZDU). The ZDU is a One Health coordination unit within the Kenyan government and the MTWG spans multiple sectors and disciplines, from government representatives, universities and research organizations to partner organizations. The MTWG agreed the government would notify OIE if it detected non-zoonotic MERS-CoV strains. It also recommended that the Ministry of Health follow up on in-contact humans.
97. The outputs of EPT-2's MERS-CoV work have also informed key aspects of international policy and strategy. A global MERS-CoV meeting organized by WHO, FAO and OIE in September 2017 produced a declaration, soon to be published as *Good practices and recommendations for addressing risks MERS-CoV at the Human–Animal Interface*.

### 3.2.1.3 Other zoonotic diseases

#### **Finding 11. EPT-2 effectively improved prevention, detection and response for a range of endemic zoonotic and transboundary animal diseases, even if not specifically targeted.**

98. In addition to avian influenza and MERS-CoV, many countries identified other zoonoses requiring disease control programmes. Typically, these included rabies, anthrax, RVF and, more infrequently, brucellosis and streptococcus suis. In some countries, strategic plans for the detection, monitoring and control of these diseases have been developed and



endorsed, but there has only been limited progress on disease control to date, due to a lack of upscaling. For example:

- i. **Bangladesh** now has an endorsed national strategic plan for the control of rabies, with funding from the Ministry of Health and Family Welfare. Guidelines have also been prepared for the control of anthrax.
  - ii. In **Indonesia**, the project has supported rabies control in Bali and in neighbouring provinces. There is evidence of reduced incidence in animals and people in Bali, but not in the neighbouring provinces or nationally.
  - iii. In the **Lao People's Democratic Republic**, National Animal Health Laboratory (NAHL) capacity has been significantly increased for avian influenza, with ISO17025 accreditation and proficiency testing extended to porcine respiratory reproductive syndrome, classical swine fever, rabies, African swine fever, Newcastle disease (NDV) and swine flu. The PREDICT 2 protocols for emerging infectious diseases were also established at NAHL (and other national laboratories in Southeast Asia). Successes were reported in relation to the country's EPT-2-supported response to the large African swine fever (ASF) outbreak, as well as its detection and response to the incidence of anthrax in the southern provinces.
99. EPT-2 also provided resources for key staff at FAO headquarters to guide and support capacity development in Africa, by continually improving risk monitoring and assessment and delivering webinars on major zoonotic diseases for countries and regions. For instance, the aforementioned GEMP training on transboundary animal diseases and other activities to strengthen veterinary officer capacity in Nigeria (in 2018) reportedly helped to improve the early detection, investigation and control of outbreaks of equine influenza (detected in late December 2018) in Sokoto state.
100. Furthermore, the evaluation team noted that many African countries needed significant training support in the use of decision support tools and the interpretation of risk maps. Disease information, collected and stored in EMPRES-i, developed by GLEWS, addressed this need by providing early alerts and warning messages for at-risk countries. For example, building on modelling work dating back to 2005, NSAH used EPT-2 funds to develop and apply spatiotemporal risk-prediction models to explain, forecast and assess the risk of emergence and spread of zoonotic diseases such as RVF, anthrax, avian influenza and Ebola (FAO, 2018c; Pittiglio et al., forthcoming; Von Dobschuetz et al., 2018). RVF received most attention in this regard over the course of EPT-2 (FAO, 2019b).<sup>17</sup>
101. FAO has a long experience in supporting veterinary laboratories, hence its development of the LMT and specific modules for detailed assessment of specific issues. These include the LMT Safety module for biosafety, biosecurity and staff safety; the LMT AMR module, which is part of FAO's Assessment Tool for Laboratories and Antimicrobial Resistance Surveillance Systems (ATLASS); and the Laboratory Information Management System (LIMS). An African version of LIMS, called SILAB, supports improved sample traceability and management. A

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<sup>17</sup> Between 2016 and 2019, the FAO successfully forecasted RVF events in the Gambia, Kenya, Mauritania, Rwanda, Senegal, South Africa and Sudan. Warnings were sent to affected countries several weeks before the outbreaks were detected and reported. The tool was also used for the retrospective analysis of RVF outbreaks and to conduct JRAs with WHO, OIE and the United States National Aeronautics and Space Administration (NASA). FAO convened a major regional RVF technical workshop in August 2018 and has an RVF Action Framework to provide medium-term guidance on building capacity for more effective risk-based surveillance of and response to RVF.

mix of EPT-2 and GHSA underpinned significant laboratory support in Africa in the form of LMT and SILAB assessments, plus the supply of equipment, reagents and consumables. FAO's lab unit in NSAH also facilitates external quality audits and biosafety and biosecurity training for African veterinary laboratories, supported by regional quality assurance workshops for West, Central and East Africa (see Box 3).

### **Box 3: Examples of successful national lab support on other zoonoses**

Lab support for **Cameroon** following a 2016 outbreak of HPAI enabled the country to diagnose 22 H5N1 and H5N8 outbreaks, as well as 115 outbreaks of rabies, African horse sickness, equine influenza, CBPP, African swine fever, PPR, brucellosis, salmonellosis, FMD and RVF between 2016 and 2019. The Lanavet lab is now ISO 17025 accredited for PPR and CBPP diagnosis using PCR and enzyme-linked immunosorbent assay (ELISA) techniques.

Following SILAB/LIMS and the provision of relevant equipment, primers and probes for priority zoonotic diseases, the National Animal Disease Diagnostics and Epidemiology Centre in **Uganda** increased its diagnostic capacity to include anthrax, brucellosis, rabies, RVF, Marburg and plague.

Proficiency testing for avian influenza, Newcastle disease (NDV) and rabies diagnosis has been rolled out in EPT-2 countries, such as **Ghana**, with the support of an FAO reference centre, IZSve Padova, in Italy.

The emergency equipment stockpile project discussed in section 3.2.1.4 has supported outbreak investigations for a range of zoonotic diseases. In addition to avian influenza and MERS-CoV, reagents and equipment have been supplied for RVF, NDV, rabies and Mycobacterium tuberculosis, as well as the laboratory detection of Pseudomonas aeruginosa and multi-drug resistant bacteria.

#### **3.2.1.4 Emergency equipment stockpile project**

**Finding 12. The emergency equipment stockpile project was an innovative initiative that successfully facilitated rapid diagnosis and response in high-risk situations of zoonotic disease outbreaks, particularly HPAI and RVF.**

102. The Global Stockpile of Emergency Animal Disease project (OSRO/GLO/504/USA), another of the EPT-2 components, handled three categories of product: personal protective equipment (PPE), diagnostic reagents for particular disease outbreaks and sample transportation materials. For the duration of the project, 17 countries received PPE to manage outbreaks, 21 countries suffering an undiagnosed disease were able to ship diagnostic samples to an FAO reference centre for confirmatory diagnosis and/or subtyping, and 14 countries with diagnostic capacity, but lacking relevant reagents to confirm a disease diagnosis, were supported with reagents. Twenty-three countries have now signed up for rapid (online) deployment of PCR primers when they need them.
103. Key informants at country level confirmed general satisfaction with the emergency equipment stockpile project, however, they experienced issues when it came to export logistics, including the clearance of goods shipped from Dubai and the management of paperwork in recipient countries. Figures show that most shipments arrived within three to four weeks, but some shipments took 50 days or longer amid the logistical challenges of the COVID-19 pandemic. To speed up delivery, EPT-2 established smaller stockpiles in

Rome (from 2017) and Bangkok (from 2018).<sup>18</sup> FAO was able to use its diplomatic bags to send initial batches of PPE, usually within a few days of obtaining donor approval, with further larger supplies following on from Dubai. A typical rapid supply would include 300 to 500 coveralls, plus masks, gloves, etc., for culling, cleaning and emergency investigation.

104. Practical lessons have been learned on how to effectively manage a global stockpile of specialist equipment and reagents, and improvements in response mechanisms, logistics and training have been implemented. A key learning of the project was that, for items to arrive in time for an outbreak investigation, the initial shipment should be approved at the rumour stage. The project also learned that training in the correct use and disposal of PPE was key. This included developing standard operating procedures for staff entering infected areas.
105. Infectious sample shipment training packages have ensured compliance with international regulations on the handling and shipment of biohazard samples and have protected front-line staff from biosecurity risks. They made it possible for some African countries (such as Ghana, Cameroon and the Democratic Republic of the Congo) to rapidly ship samples to international laboratories for confirmatory diagnosis. Infectious sample shipment training is an international requirement before samples can be dispatched in compliance with International Air Transport Association (IATA) rules. In collaboration with GHSA, EPT-2 trained more than 100 people from African countries, plus staff from the Pan African Veterinary Vaccine Centre of the African Union (AU-PANVAC). As a result of AU-PANVAC's involvement, DTRA subsequently funded the development of a regional strategy on biological sample transport.

### **3.2.2 FAO's contribution to policy development and the enabling environment on animal health**

106. The third objective of the EPT-2 programme was to strengthen the enabling environment for multi-sectoral collaboration in terms of national/regional coordination mechanisms, strategies and laboratory policy. FAO was tasked with advocacy and communication work to advance One Health practices and improve policy.

**Finding 13. The EPT-2 programme successfully supported animal health strategies and policy development to meet the overarching EPT-2 goal of reducing the risk and impact of emerging pandemic through a One Health approach. However, few policies were enacted that enabled the scale-up of disease control programmes. The ASL 2050 component initiated a robust policy process that will facilitate future livestock policy development. AMR work in Asia has influenced policy, assisting in the development of national action plans and key legislation.**

107. Strategic preparedness and control plans, primarily for avian influenza, have been formulated with EPT-2 support in most African and Asian countries targeted by the programme. These include Nepal's National Preparedness Plan for Avian Influenza, Viet Nam's National Plan for Avian Influenza Disease Prevention and Control 2019–2025; the Lao People's Democratic Republic's Joint National Preparedness and Contingency Plan to Respond to Avian Influenza H7N9 and H5N1; and Myanmar's Pandemic Influenza Preparedness Plan.

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<sup>18</sup> Focused on H7N9 preparedness in Southeast Asia.

108. National and regional One Health strategies (and AMR strategies in Asia) have also been strengthened as a result of the EPT-2 programme,<sup>19</sup> demonstrating the strong and trusted technical partnership between FAO and national line ministries. These partnerships have also influenced broader national livestock policy development in some Asian countries. For example, indirect influence on policy was reported in China, where alumni of the FETPV influenced the development of the national five-year plan on animal health and its translation into relevant action plans at national level.

#### Box 4: Examples of FAO's policy support

In **Viet Nam**, FAO supported the National Action Plan for Reducing Antimicrobial Resistance and Management of Antimicrobial Usage in Livestock and Aquaculture. It also assisted with an animal husbandry sub-law, including decrees, to guide the implementation of the Animal Husbandry Law and related penalties, as well as circulars on managing, updating and using the national livestock database, breeding management and regulations on livestock production.

In **Myanmar**, FAO supported the Livestock Breeding and Veterinary Department in working with the Ministry of Health and Sports to develop its Pandemic Influenza Preparedness Plan and the Myanmar National Action Plan for Containment of Antimicrobial Resistance.

Though EPT-2, **Egypt** agreed on the framework for a five-year Avian Influenza Prevention and Control Strategy with the Ministry of Agriculture and Land Reclamation and actively engaged the Ministry's leadership in enacting an overarching One Health coordination mechanism.

In **Kenya** and the **United Republic of Tanzania**, the programme facilitated the development of strategies for the control of some priority zoonotic diseases (brucellosis and anthrax) and the development of guidelines for the integrated surveillance of zoonotic diseases.

In **Ghana**, a collaboration between FAO and WHO lent support to the National Disaster Management Organization to coordinate the development of a One Health policy.

Indirect influence on policy was observed in **China**, where the alumni of the FETPV influenced the development of the national five-year plan on animal health and its translation into relevant action plans at national level.

ASEAN and the SAARC were supported in their regional AMR strategies, for example, in the development of regional AMR surveillance guidelines for aquaculture pathogens.

109. Furthermore, EPT-2 continues to support the FAO Veterinary Laboratory Policy guidelines on developing the policies and legislation needed to maintain accessible, efficient and cost-effective veterinary laboratory services. EPT-2 support also enables laboratories to fulfil their critical role in zoonotic disease detection, prevention and response and creates links to WHO's Global Laboratory, the Leadership Programme and OIE's Sustainable Laboratory Performance of Veterinary Services (PVS) assessment tool to ensure gaps in service are identified and coordinated.

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<sup>19</sup> For instance, Viet Nam's National Action Plan for Reducing Antimicrobial Resistance and Management of Antimicrobial Usage in Livestock and Aquaculture.

### 3.2.2.1 ASL 2050

110. The ASL 2050 project (OSRO/GLO/602/USA) was implemented in six pilot countries: Burkina Faso, Egypt, Ethiopia, Kenya, Nigeria, and Uganda.

**Finding 14. ASL 2050 is a timely and popular initiative that has raised awareness of livestock trends and issues and established a solid foundation for future decision-making processes. Thanks to FAO's ASL 2050 work, country governments, donors and other key stakeholders can now identify key policy constraints and develop policies that address risks to the environment from the livestock sector and to public health from zoonotic diseases and AMR.**

111. Despite a delayed start,<sup>20</sup> the ASL 2050 project introduced robust policy processes to six pilot countries by enabling key stakeholders to work collaboratively and to visualize how selected livestock value chains would evolve to 2050, including likely impacts on livelihoods, public health and the environment on the basis of available evidence and trends. Multi-sectoral steering committees formed to drive the process, with the support of the FAO Livestock Information, Sector Analysis and Policy Branch (NSAL) and ECTAD, were still active during the evaluation missions. National steering committees, comprising experts from the ministries in charge of health, livestock and environment, had adopted a One Health approach and, in some countries, such as Burkina Faso, it had become an official One Health platform (One Health Burkina Faso).
112. ASL 2050 examined and documented the potential environmental, social, economic, animal health and public health implications of projected livestock-sector development to 2050. Synopses of the current and projected development status of the selected livestock value chains, evidence on their impact on public health, the environment and livelihoods, plus the long-term (2050) scenarios, opportunities and challenges are presented in numerous reports, briefs and other materials available on the ASL 2050 website (FAO, n.d.). Key informants mentioned these materials and there was strong ownership of the process at country level. ASL 2050 also completed a comparative analysis of livestock-sector development in Asia and Africa and produced reports based on a range of parameters, including public health impacts, environmental impacts, drivers of sector development, livelihoods and sector growth and transformation. These comparisons provided valuable context for African policymakers
113. ASL 2050 methodology included an examination of livestock value chains in agreed sub-sectors, which subsequently strengthened national capacities. For example, Burkina Faso acquired a methodology enabling the country to characterize and map its livestock production systems, in particular, cattle and poultry. This allowed the Ministries for Livestock, Environment and Public Health to identify, for the first time, priority areas requiring policy reform and investment.
114. Progress on identifying actionable policy priorities, policy instruments and process is less advanced,<sup>21</sup> but has begun in some of the pilot countries. In Kenya, for instance, senior policymakers have asked FAO's ASL 2050 team to present the future scenarios in key

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<sup>20</sup> ASL 2050, formed in 2015, became operational in January 2017 when the Global Coordinator took office.

<sup>21</sup> This was partly attributed to the United States of America's government budget shutdown of 2019. ASL 2050 ran out of funds and stopped all activities for about six months (two headquarters staff had to take leave because of a lack of resources to renew their contracts).

conferences on biosafety and biosecurity, AMR and livestock value chains, as well as to support the ongoing formulation of a national Livestock Master Plan.

115. Thanks to EPT-2 and ASL 2050 resources, FAO engaged African RECs in workshops to discuss challenges associated with increasing demand for animal source foods in the coming decades and how livestock development could be best coordinated on a regional scale to mitigate the potential negative impacts. For instance, the Intergovernmental Authority on Development in Eastern Africa (IGAD) Centre for Livestock and Pastoral Development (ICPALD) indicated that such analyses could greatly facilitate its work on livestock policy development, harmonization and trade, and expressed interest in developing regional scenarios.

### **3.2.2.2 AMR**

116. The original EPT-2 SAFs (see Section 2) made no reference to AMR. This was introduced when EPT-2 was aligned with GHSA, as JEE assessments cited national need. A series of activities was developed at regional and national level in Asia, with funding from EPT-2 project OSRO/RAS/502/USA.

**Finding 15. EPT-2's activities to address AMU in Asia's livestock production industries saw high levels of innovation and receptiveness. As part of the long-term avian influenza response in Asia and the One Health approach promoted by the FAO Regional Office for Asia and the Pacific (RAP), the initiative built on FAO's experience of dealing with market chains and production systems, as well as the laboratory capacity development work implemented by ECTAD through EPT-2 projects. The initiative also proved a good example of ECTAD's adaptive management, boosting its relevance to global health priorities. ECTAD has now been spearheading FAO's AMR work for more than four years.**

117. The Asia regional AMR project, agreed in late 2015, predated the FAO Action Plan on AMR (FAO, 2016e). It built on the One Health approach of RAP and demonstrated high levels of collaboration between the Regional Animal Health and Production Officer and the Regional ECTAD team. The project's five outputs are also aligned with the Global Action Plan on AMR and significant progress seems to have been made, especially with regard to awareness-raising and AMR surveillance. FAO also ensured complementarity and value addition with the other major AMR project in Asia, GCP/GLO/710/UK (Fleming Fund), aligning objectives and improving geographical coverage.
118. A stocktaking exercise among FAO AMR teams across Asia in 2019 suggested that sizeable momentum was building to address AMR. Significant emphasis has been placed on regional coordination, with bodies such as SAARC and ASEAN involved from the outset, along with the Tripartite partner regional offices – WHO in Delhi and Manila and OIE in Bangkok and Tokyo.<sup>22</sup> Consultations have also taken place with the United Nations Environment Programme (UNEP) in Bangkok. AMR Technical Advisory Groups (TAGs) were formed for Southeast and South Asia. Formal mechanisms link the AMR TAGs with relevant sectoral bodies under ASEAN and SAARC to ensure regionally harmonized policies and approaches. The Fourth Meeting of SAARC Agricultural Ministers in 2019 adopted a statement on SAARC's cooperation on AMR and a regional action plan to curb AMU and AMR in the region.

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<sup>22</sup> Proceedings of the Inception for Workshop OSRO/RAS/502/US project, addressing antimicrobial usage in Asia's livestock production industry, Bangkok, Thailand, 29 January 2016.

There is an FAO-OIE coordinating group of leading AMR institutions in the Asia-Pacific Region, whose outputs include a regional guide for governments to review, update and develop policies to address AMR and AMU in animal production (the 2018 AMR Policy Review and Development Framework) (FAO, 2018d).

119. World Antibiotic Awareness Week (WAAW) is celebrated annually thanks to the support of EPT-2 project OSRO/RAS/502/USA. For example, 2019 saw the publication of a Regional WAAW Toolkit (FAO, 2019c) and Chulalongkorn University in Thailand was appointed as one of four FAO reference centres for AMR. To reflect the key focus of EPT-2's work on surveillance capacity, in 2019, FAO published the *Regional AMR Monitoring and Surveillance Guidelines, Volume 1* (FAO, 2019d). EPT-2, in collaboration with the Fleming Fund, further supported national and district WAAW events, for instance, in Indonesia.
120. Although not developed solely by EPT-2, FAO ATLASS has been piloted by the FAO ECTAD team in Asia since 2017 and refined accordingly. In collaboration with the Fleming Fund, ATLASS has now been used in 15 countries and 28 AMR labs across Asia. FAO AMR Reference Centre, Chulalongkorn University also has a key training support role to address shortcomings identified through ATLASS missions, which will eventually include proficiency testing.
121. EPT-2 has also developed an assessment tool for antimicrobial residues in collaboration with the Bureau of Quality Control of Livestock Products in Thailand and the Singapore Food Agency. The roll out of this tool should happen in the next phase and will identify priority areas for improvement.
122. Significant progress has been made in key EPT-2 countries in Southeast Asia, with baseline surveillance of AMR being undertaken in addition to AMU monitoring activities. The project has supported the development of surveillance methodologies and base-level antimicrobial susceptibility testing at prioritized national laboratories, as well as staff training in sample collection, shipping and testing, plus information management and reporting. These baseline activities have demonstrated the severity of the AMR problem in countries including Bangladesh, Indonesia and Viet Nam, all of which have shown high levels of resistance to multiple antimicrobials in salmonella and E. coli samples collected mainly from poultry, but also from pigs (in Viet Nam). The evidence provided has led to significant policy change, with new legislation banning the use of antimicrobial growth promoters, the critically important withdrawal of antimicrobials (per the WHO list), the development of national action plans and improved stewardship, with improved awareness and the preparation of usage guidelines in Indonesia, Bangladesh, Cambodia and India. Some awareness and extension activities have also been undertaken, presenting the scale of the AMR problem along with information on AMU.
123. Though EPT-2 has not carried out any direct work on AMR work in Africa, ECTAD staff have been utilized as AMR focal points for GHSA and Fleming Fund activities (GCP/GLO/710/UK). Furthermore, the complementarity of EPT-2's One Health strengthening, the ASL 2050 policy work and EPT-2 value-chain analyses underpinned AMR initiatives in Africa.

### **3.2.3 FAO's contribution to One Health multi-sectoral collaboration**

124. Another objective of the EPT-2 programme is to strengthen workforce capacity for One Health in terms of education, field training and sensitization.

**Finding 16. The FAO EPT-2 programme has promoted and strengthened the One Health approach at national and regional levels, in line with the 2011 One Health FAO Strategic Action Plan<sup>23</sup> and overarching EPT-2 objectives. The evaluation found that national One Health mechanisms generally need further development and that the assessment tools being developed with EPT-2 funding are a crucial mechanism for prioritizing support.**

125. EPT-2 contributed to and benefited from the Tripartite agreement between FAO, OIE and WHO, which is the technical backbone of the global One Health agenda. Through the agreement, the three technical organizations have made commitments and assumed specific roles and responsibilities in line with their institutional mandates. FAO's mandate covers One Health issues affecting the agrifood system, such as AMR, food safety and zoonotic diseases. EPT-2 played no role in strengthening One Health within FAO itself, although it made valued contributions to FAO's AMR response.
126. With EPT-2 support and in collaboration with WHO and OIE, FAO has developed the Joint Operational Tool to conduct JRAs to gauge skills at the human–animal–ecosystem interface. The JRAs are designed to explore information gaps on specific zoonotic diseases. If used iteratively, they can encourage participating agencies to identify strategies for collecting missing information, promoting intersectoral collaboration and better zoonotic disease outbreak management over time. JRA training workshops and the first JRA pilot were funded under EPT-2 in Indonesia in 2018. The JRA tool is currently being rolled out in 14 countries, with more planned. It will be reviewed and revised based on national feedback. Initial feedback suggests there is demand for the tool to be adapted for use with endemic as well as epidemic zoonotic diseases.
127. The complexity of institutional change, particularly at country level, to facilitate a substantive One Health approach – where different disciplines plan together around a shared budget, infrastructure and training programmes – is well recognized by the international development community (Berthe et al., 2018). The evaluation noted that EPT-2 had supported the establishment of One Health coordinating committees in most target countries,<sup>24</sup> but that their institutionalization, functionality and operational capacities varied. In Kenya, for instance, the Ministry of Agriculture, Livestock and Fisheries and Ministry of Health jointly established the Zoonotic Disease Unit (ZDU) in response to frequent incursions of zoonotic diseases, such as RVF, and the threat of HPAI, as well as a One Health-based joint secretariat manned by epidemiologists from both ministries.
128. Through EPT-2, FAO has worked closely with the ZDU on the development of strategic documents, the investigation of suspected outbreaks, MERS-CoV detection and field studies and ASL 2050 scenario development. Kenya has also used JRAs to identify factors that raise the risk of RVF epizootics and specific actions to mitigate those risks, developing vector surveillance systems based on the results. Similarly, multi-sectoral collaboration led to the development of cost-effective vaccination programmes for high-risk areas.

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<sup>23</sup> The objective of the action plan is “to achieve food security and health security by strengthening veterinary and animal production systems so they can better monitor disease threats and care for the health of livestock and the environments they are raised in” (FAO, 2011).

<sup>24</sup> One Health platform and mechanisms were reported in Cambodia, Indonesia, Viet Nam, Thailand, Bangladesh, Sierra Leone, Ghana, Egypt, Ethiopia, Kenya, the United Republic of Tanzania and Cameroon. The role EPT-2 played in their establishment and operation varied from country to country.



129. Nonetheless, the existence of other One Health mechanisms coordinating AMR and food-safety initiatives in Kenya underscores the need for One Health to be properly institutionalized and for interventions to be mainstreamed under one umbrella. Although the development of mechanisms with a clear distribution of roles and responsibilities is crucial, the Kenyan example shows that while an inter-ministerial committee or taskforce at central level is easy to establish, this does not guarantee effective joined-up operations. Still, in those countries that were not visited by the evaluation team, the responses from the external survey show a slight, but statistically significant<sup>25</sup> increase in funding by government partners to boost workforce capacity to implement a One Health approach.
130. At regional level, RECs have endorsed the One Health approach in nearly all regions, though it is difficult to determine whether this can be attributed to FAO's work. The 2016 One Health ministerial meeting to fight against zoonoses and other related threats to public health in Senegal, for example, produced a strongly worded communiqué, directing the Regional Centre for Disease Surveillance and Control of ECOWAS to become operational and making 10 other recommendations to support the institutionalization of a One Health approach, with the participation of FAO and other partners (WHO, 2016). ECOWAS has since prioritized zoonotic diseases for One Health collaboration and is in the process of facilitating its rollout in all member states. In Asia, both ASEAN and SAARC are committed to the One Health approach, as evidenced by their investment in AMR.

### 3.3 Connectedness

#### 3.3.1 External partnerships

**Finding 17. Through ECTAD, FAO is a trusted and respected partner and effective partnerships were found at all levels of EPT-2. In Asia, FAO has developed a robust network of partners and collaborators among key regional and sub-regional actors. In Africa there have been fewer opportunities for such collaboration. Overall, partnerships were found to place a strong emphasis on technical capacity-building and the One Health approach in programme design, particularly with the technical ministries at national level.**

#### Global level

131. At global level, ECTAD engaged effectively with its Tripartite partners. UNEP has also been increasingly engaged in One Health and AMR discussions, though no significant partnership was evident with international or multilateral financial institutions, such as the World Bank or regional development banks, despite their being considered influential partners with governments and regional bodies.
132. The evaluation team met with representatives of OIE and WHO while visiting Regional and Country Offices and reported a generally good level of collaboration and support with respect to EPT-2, to efforts to strengthen the One Health approach and to achieving joint goals for AMR. The functional Tripartite mechanism in RAP predates EPT-2.
133. FAO staff at headquarters and in the liaison office in Geneva were responsible for strengthening global inter-agency collaboration with key agencies (such as WHO, the World Trade Organization and UNEP) under the framework of the 2030 Agenda 2030 and

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<sup>25</sup> Calculated at the 5 percent significance level.

advocating for the development of health-system capacity using a One Health approach. EPT-2 contributed to a number of inter-agency outputs, including risk assessments to support the global animal influenza networks, Tripartite publications, such as the operational tools in the *Tripartite Zoonoses Guide* (FAO, WHO and OIE, 2019), and numerous AMR tools and publications through EPT-2's AMR work in Asia.

134. As part of the Global Laboratory Leadership Programme, EPT-2 supports and contributes to "laboratory workforce development", involving FAO, WHO, OIE, CDC in the United States of America, the European Centre for Disease Prevention and Control and the Association of Public Health Laboratories. The programme aims to ensure a One Health approach to laboratory leadership training and to promote coordination and cooperation within a country's health laboratory system. It is also linked to the GHSA. Through it, FAO supports veterinary diagnostic laboratories in Africa. ECTAD has also linked national laboratories with reputable and specialized laboratories globally for technical support and more sophisticated testing, such as virus characterization and pseudo particle neutralization.

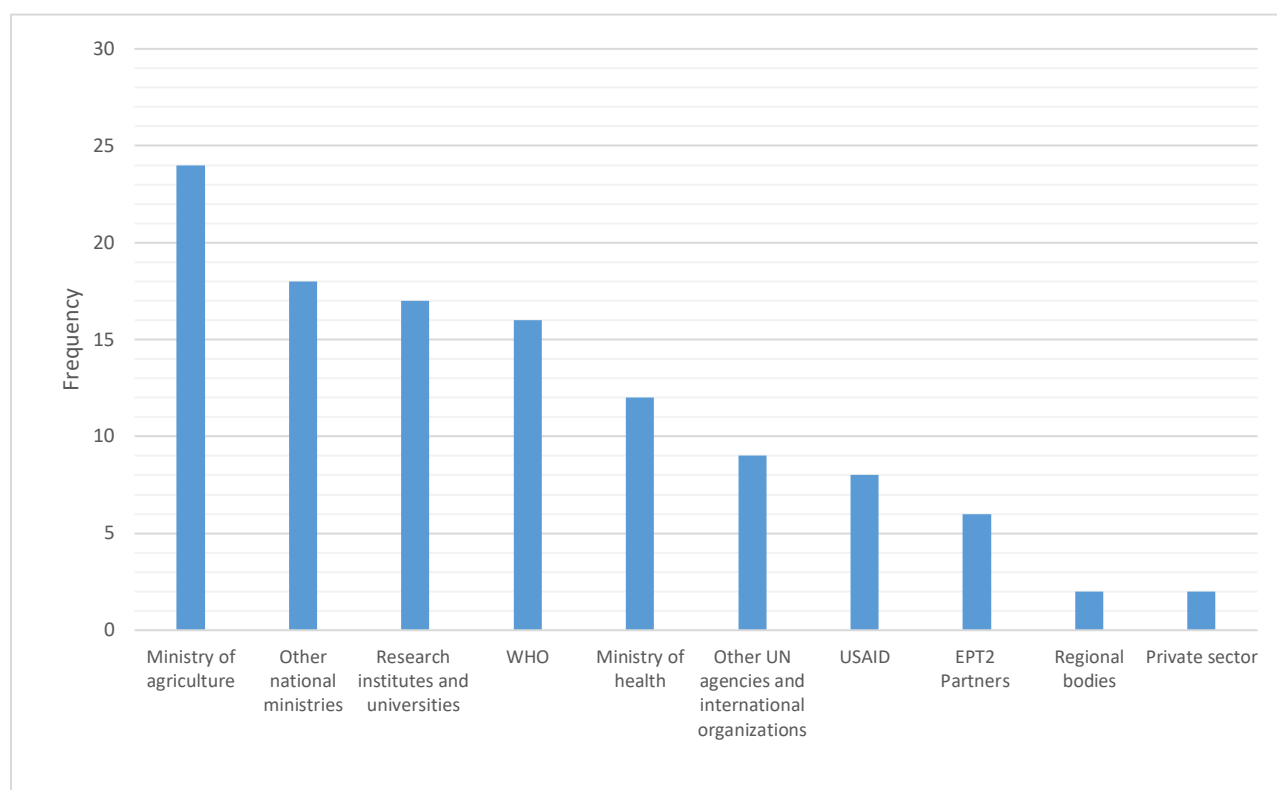
### **Regional level**

135. Regional organizations play important harmonization and normative roles. The quality of the partnerships between regional ECTAD teams and regional organizations under the EPT-2 programme was varied. Strong and effective partnerships were observed with ASEAN in Southeast Asia and SAARC in Southern Asia. Partnerships in Africa have been slower to develop, for example, with the African Union Inter-African Bureau for Animal Resources (AU-IBAR) and the three key RECs: ECOWAS, IGAD and the Economic Community of Central African States (ECCAS). Informants from African RECs said they did not view invitations to FAO EPT-2 meetings as meaningful engagement or partnership.
136. In the Asian region, ECTAD has been working with the ASEAN Sectoral Working Group on Livestock on a number of collaborative activities to address high-impact emerging and re-emerging infectious diseases and other health threats. The ASEAN Coordinating Centre for Animal Health and Zoonoses has been established and supports the coordination and implementation of activities related to EPT-2, such as veterinary epidemiology and animal health laboratory capacity development, animal health communication and actions to address regional priority diseases and zoonoses. A number of strategies, frameworks, and action plans have been developed, such as the Regional Strategic Framework for Laboratory Capacity Building and Networking in ASEAN, the Regional Strategic Framework for Veterinary Epidemiology Capacity Development and Networking in ASEAN, the Regional Strategic Communication Framework for Livestock, the ASEAN Rabies Elimination Strategy (ARES) and the ARES Action Plan.
137. To support the delivery of these frameworks, a number of technical working groups have been created: the ASEAN Laboratory Directors Forum, ASEAN Veterinary Epidemiology Group and the ASEAN Communication Group for Livestock. Animal health and human health sectoral working groups have been encouraged to meet and discuss collaborations and joint activities. ASEAN has also recognized the regional FETPV, based in Thailand, as a training platform for strengthening in-service veterinary epidemiology capacity.
138. SAARC has also been active in strengthening regional disease prevention and control, undertaking a number of initiatives with support from the ECTAD regional team for Asia. The focus has been on developing regional roadmaps and harmonized approaches to the control and eradication of transboundary animal diseases.

139. In Africa, the evaluation noted relatively weak levels of partnership with AU-IBAR and the RECs. AU-IBAR representatives expressed interest in collaborating with FAO on programmes such as EPT-2, citing the need to ensure a coordinated effort at both national and regional level. FAO ECTAD's links with the Centre for Pastoral Areas and Livestock Development (ICPALD) were considered tenuous. ICPALD had a number of consultations with the ECTAD Sub-regional team with a view to enhancing collaboration, especially on ASL 2050 and MERS-CoV in the Horn of Africa. The results of a 2020 joint strategy meeting to discuss the Regional Animal Health Network, AMR and One Health, including RVF, plus partnership for resource mobilization were encouraging. In West and Central Africa, links with ECOWAS, IGAD and the Economic Community of Central African States (ECCAS) have been limited.

### **National level**

140. The evaluation team observed the strongest partnerships between technical departments and ministries at national level. ECTAD has been adept at supporting national partnerships by facilitating links between government and specialized laboratories, including FAO reference laboratories. The ASL 2050 initiative has further bolstered partnerships and broadened networks at national level. Through EPT-2 activities, ECTAD has raised FAO's visibility at country level by providing credible animal health expertise and governmental support. There is no doubt that FAO ECTAD is a trusted and respected partner at national level.
141. In countries not visited by the evaluation team, external respondents ranked FAO as a strong partner on the whole, with an average score of five on scale of one to six. The scores were similar in Asia, East and West Africa. Internal respondents were asked to list up to three key partnerships and the responses can be seen in Figure 8.

**Figure 8: Internal survey – key EPT-2 partnerships listed by FAO respondents**

Source: Evaluation team.

### 3.3.1.1 EPT-2 consortium partners

#### **Finding 18. National and regional FAO ECTAD teams have worked closely with EPT-2 consortium partners, generating a strong coordination and synergy across the programme.**

142. EPT-2 consortium partners had regular in-country meetings with USAID advisors and moderators to discuss disease situations and other relevant information. For example, monthly meetings were convened in Cameroon, Kenya and Indonesia. Quarterly meetings were convened in the Lao People's Democratic Republic.
143. There has been good sharing of data and the adoption of PREDICT 2 protocols by many national diagnostic laboratories. Through EPT-2, FAO assisted laboratories in establishing the PREDICT 2 laboratory protocol training and technology transfer for five priority emerging infectious disease virus families (flavivirus, filovirus, coronavirus, influenza and paramyxovirus) in most countries. The collaboration between FAO and PREDICT 2 also resulted in joint triangulated surveillance activities by multidisciplinary One Health teams at the wildlife–livestock interface in several countries.
144. In several countries, FAO supported the One Health University Network. For example, in Indonesia, there has been some cross-over between FAO's work in developing FETPV, veterinary school curriculums on epidemiology, One Health and AMR and the Indonesia One Health University Network Field Epidemiology Education and Training Programme.

### 3.3.1.2 The private sector

**Finding 19. EPT-2 engagement with the private sector was generally limited, as government departments were its principal partners at country level. FAO supported farmer and market traders through biosecurity, surveillance and extension efforts with its government counterparts. Industry associations tended to be engaged in an ad hoc manner as key stakeholders in strategy development. Field offices had insufficient understanding of guidance on how FAO could develop functional relationships with private-sector entities.**

145. Bangladesh, Indonesia and Viet Nam have all developed high biosecurity model farms with smaller commercial operators, leading to some reduction in costs of production, improved feed conversion and greater profitability. Extension activities arising from the improved production systems adopted on these model farms have been limited to date. There has been little direct engagement with the larger-scale poultry companies, which have greater capacity to implement biosecurity and vaccination protocols and to engage with government counterparts.
146. Industry producer groups vary from country to country and, where they exist, provide an opportunity for broad engagement as potential drivers of change. In Egypt, for instance, the evaluation team saw that FAO had a good relationship with the Egyptian Poultry Association (EPA) in Cairo, which includes hatchery companies and feed millers. The EPA had a strong policy agenda for transforming the country's poultry industry and cited FAO as a key technical partner. EPA representatives were keen to finalize a memorandum of understanding with ECTAD, but frustrated by a 12-month bureaucratic clearance process at FAO headquarters. On MERS-CoV FAO engaged with the Kenya Camel Association as a stakeholder in virus surveillance, though this was mainly about circumventing camel keepers' resistance to sampling than involvement as a strategic partner.
147. In Bangladesh, FAO supported the country's strong national AMR programme and engaged with antimicrobial manufacturers from the local private-sector pharmaceutical industry, resulting in the critically important voluntary withdrawal of certain antimicrobial drugs from their product lists. The EPT-2-funded AMR initiative in Asia also collaborated with ThermoFisher Scientific by way of a technical working group to develop customized Microbroth dilution plates in line with a recommended regional panel of antimicrobials for testing. These are now commercially available.
148. There was evidence that private-sector actors had been invited to various One Health, surveillance network and ASL 2050 consultations, yet their collaboration and active involvement remains limited. Similarly, the internal survey show partnerships with the private sector coming in last: 34 percent of respondents said key private-sector partnerships were lacking.

### 3.3.1.3 Resource partners

**Finding 20. Although the EPT-2 Programme was not designed as an open programme for multiple resource partnerships, ECTAD teams in both Africa and Asia made attempts to engage with other resource partners by creating synergies and complementarities with animal health-related activities being conducted in parallel. In Asia, in particular, ECTAD developed good partnerships with other donors.**

149. In Asia, the EPT-2 programme coordinated and collaborated closely with Australia-funded development programmes operating in parallel in many countries. Strong synergies were developed through the sharing of workplans and the joint development and delivery of activities. For example, in Indonesia, the Australia–Indonesia Partnership for Emerging Infectious Diseases (2012–2018) focused on strengthening emergency preparedness and response systems, the development of a national animal health information system and training staff in technical and “soft” leadership skills. This work was conducted in regular discussion with the EPT-2 project. Some Australian funds were also provided directly to USAID to support the delivery of EPT-2. In 2020, Australia initiated further regional health development programmes in Southeast Asia and the Pacific. These will again focus on One Health and talks on priorities have taken place with RAP and FAO country teams. An Australian veterinarian is now working from RAP on liaison and to support FETPV courses.
150. The EPT-2 programme also benefited from collaborations with the United Kingdom Fleming Fund project (ongoing until the end of 2021), which provided support to combat AMR in the Asian region, and with regional Tripartite and bilateral country programmes in several countries (Indonesia, Papua New Guinea, Timor-Leste, Viet Nam, India, Myanmar and the Lao People’s Democratic Republic), during the development of which FAO staff working on EPT-2 undertook close consultation and information sharing.
151. In Africa, programme implementation saw close collaboration with other United States-supported activities and programmes, such as GHSA and CDC work at country level. The Fleming Fund’s projects supported and worked closely with EPT-2 on ECTAD-implemented AMR activities in some countries. Korea has also been a resource partner, supporting EPT-2 activities with value-chain analysis in Africa.
152. In some instances, FAO ECTAD’s technical collaboration with WHO involved cost-sharing on certain One Health-related activities. This was the case in the facilitation of One Health policy work by the National Disaster Management Organisation in Ghana. The Regional Office for Africa made efforts to develop a regional strategy and flagship programme for Western, Central and Eastern Africa, in which other donors had shown interest (for example, the United Kingdom Department for International Development, the African Development Bank [AfDB] and Irish Aid). Reportedly, FAO had spearheaded the approach.

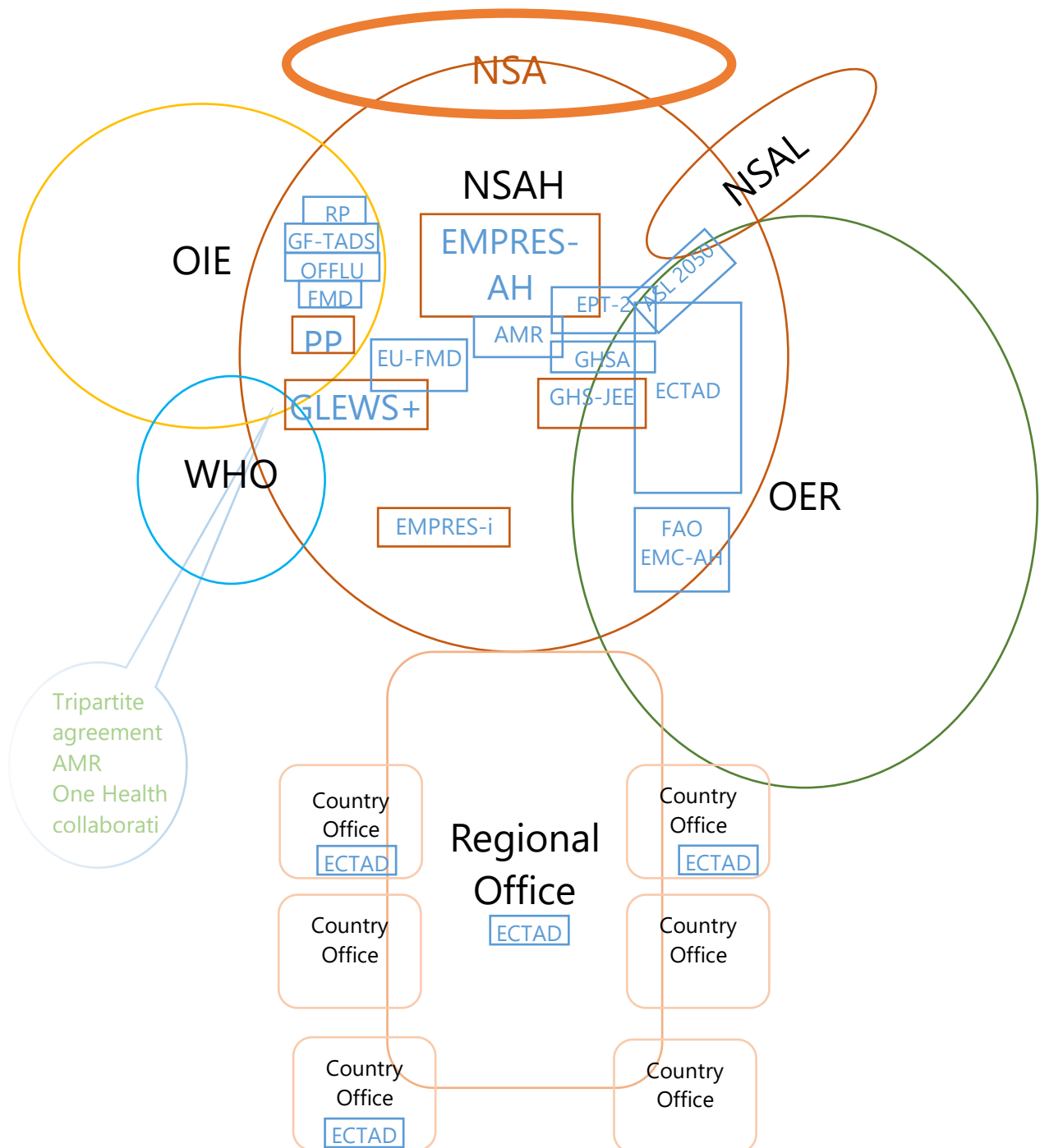
### 3.3.2 EPT-2 implementation arrangements

**Finding 21. EPT-2 funding has brought significant synergy, visibility and benefit to FAO’s work on animal health, including to ECTAD’s emergency response and resilience-building at regional and country level. The combination of operational and technical capacity has worked well for the implementation of the EPT-2 programme and is seen as highly effective and scalable to other areas of work. Still, a lack of clarity on staff roles and responsibilities and complex reporting lines are seen as a potential hindrance to better results.**

153. ECTAD is headed by FAO’s Chief Veterinary Officer (and Head of NSAH), while an OER Senior Officer is Deputy Head (and Head of Operations). Thus, while OER is responsible for managing and guiding key operational aspects related to programme implementation (budget holding, procurement, staff deployment, etc), the Animal Health Service supervises the conduct and delivery of all technical activities (such as training, capacity development, technical clearance of equipment and outbreak response).

154. Before analysing the efficiency and effectiveness of the implementation arrangements for the EPT-2 programme, it is important to understand where the EPT-2 programme and its implementer (ECTAD) stand within the overall structure of FAO’s Animal Health and Production Department, particularly within the Animal Health Service. To this end, the evaluation team has developed a Venn diagram (Figure 9). This shows EPT-2, as well as other animal health-related activities conducted by FAO, with the various entities/bodies responsible for their work and how they are connected.

**Figure 9: Programmes and work within FAO Animal Health Service (NSAH)**



Source: Evaluation team.

155. Within NSA, the Chief Veterinary Officer supervises all technical staff and consultants working on various animal health-related programmes and projects. Thus, ECTAD personnel implementing EPT-2 support staff working for EMPRES-AH, EMPRES-i, and EMC-AH. For example, ECTAD regularly supports EMC-AH as a key member of the Incident Coordination Group and by providing GEMP training, including for the EPT-2 programme.
156. While implementing the EPT-2 programme and its components, ECTAD personnel collaborate closely with and provide service and support to other FAO animal health-related programmes, such as EuFMD, GLEWS, the OIE/FAO Network of Expertise on Animal Influenza (OFFLU) and the Global Framework for Transboundary Animal Diseases. Thanks to EPT-2 resources, ECTAD has been able to link with the PPR Secretariat and, through ASL 2050, with NSAL. As mentioned, EPT-2 also supports the AMR working group and other sub-sectors at FAO, such as fisheries, food safety, legislation, production and policy. Furthermore, EPT-2 funding has also allowed ECTAD to become involved in the broader livestock components of disaster cycle management for OER and in drought response and resilience-building initiatives in the Horn of Africa.
157. In practice, the implementation arrangements of the EPT-2 programme fall directly within the framework of the ECTAD structure and its technical and operational capabilities at different levels.
158. At global level, there is a good coordination and collaboration between ECTAD staff working on EPT-2 activities and other technical staff at FAO headquarters. Similarly, EPT-2 staff relations with OER and the SP5 team were reported to be complementary and strong. The combination of operational and technical capacity under ECTAD worked well for EPT-2. SP5's systematic collection of data and information on disaster-induced damage and losses in the agricultural sector, and the links between these data and the establishment of an Early Warning - Early Action (EWEA) analysis and information system, remain highly relevant to EPT-2's work. ECTAD reports regularly to the quarterly Food Chain Crises Bulletin and EWEA report, providing timely risk assessments and forecasts of priority animal diseases, including those developed under EPT-2.
159. At regional level, EPT-2 implementation is coordinated through the three ECTAD regional managers located in Accra (for West and Central Africa) Nairobi (for Eastern Africa) and Bangkok (for Asia and the Pacific). Furthermore, at regional and sub-regional level, ECTAD collaborates with officers from FAO's Animal Production and Health Division (NSA), FAO resilience teams and country livestock teams. The logic of strong ECTAD regional teams supporting Country Offices across a given region is appealing and there is evidence that ECTAD regional offices have assisted countries not targeted by EPT-2. This was particularly apparent during the spread of ASF across Southeast Asia and the Pacific.
160. While there is a good relationship between regional and subregional NSA officers and ECTAD regional officers working on EPT-2, it is also complex, as it is overly reliant on good personal relationships rather than structural coherence. The evaluation found no evidence of formal terms of reference on how ECTAD teams should work with regional/subregional livestock staff. Informants considered the development of such terms of reference important, including the clarification of reporting lines, as this could support a more programmatic approach, enabling FAO to strengthen its influence at regional level. by informing policy dialogue and highlighting emerging issues in a consistent way. As mentioned, for instance, the longevity and strength of ECTAD in RAP was very much down



to its relationships with ASEAN and SAARC, while its links with African RECs and AU-IBAR are still evolving.

161. At national level, EPT-2 implementation is the responsibility of the ECTAD country teams, the key advisors to FAO Representatives (FAORs) on matters related to animal health. In 2016, the Deputy Director-Generals for Climate and Natural Resources and Programmes stated that ECTAD Country Team Leaders (CTLs) would work under the administrative supervision of FAORs, in close coordination with ECTAD regional managers/coordinators and NSA officers at regional and global level. FAORs were expected to draw on the CTLs to leverage the strategic positioning of FAO within the broader animal health domain at national level. It was recommended that FAORs entrust CTLs with a leading role on animal health activities at country level. Thus, CTLs would officially be recognized as technical advisers on all animal health matters and associated public health-related issues. However, while clarity on ECTAD's role at country level has improved since 2016, the evaluation could not find evidence of a formal distinction between the roles and responsibilities of CTLs and national livestock officers, where present. Still, CTLs were consistently cited as valued members of FAO Country Office teams, underpinning FAO's presence on United Nations Country Teams and playing a potentially useful role in the imminent joint planning and programming required to implement the new United Nations Cooperation Framework and Common Country Analysis, from which FAO's Country Programming Frameworks (CPFs) will stem.
162. Overall, the strategic positioning of the EPT-2 programme under ECTAD, led by OER and NSAH, gives FAO the opportunity to share the burden of leverage funding and to expand its partnerships. This collaborative set-up puts FAO in an excellent position to implement some of its key strategic recommendations to improve One Health coordination, enhance Early Warning – Early Action (EWEA) and potentially achieve greater results on issues such as gender, capacity development and livelihoods, through stronger linkages between teams and programmes at the interface of resilience and livestock-related activities.

### Efficiency of EPT-2 implementation

**Finding 22. The OER–NSAH collaboration to support ECTAD is a key factor in ensuring efficiency in administration, logistics and the deployment of staff. While ECTAD's short-term consultancy contracts allow it to be flexible and rapidly acquire new skills, they also pose risks in terms of continuity and capacity to represent FAO and take decisions on strategic engagement. No major lapses in efficiency were found during the evaluation, though delays in procurement, approvals processing and recruitment delayed the delivery of some outputs.**

163. Through EPT-2 and GHSA programme funding, ECTAD has increased FAO animal health capacity in 27 countries.<sup>26</sup> ECTAD country teams are currently present in 16 countries in sub-Saharan Africa, two countries in the Near East and North Africa, and nine countries in Asia. ECTAD staffing is multidisciplinary at all levels and is the largest animal health workforce in FAO, as well as one of the largest animal health programmes in the world. The USAID EPT-2 evaluation lauded how quickly FAO had expanded its presence in Africa under EPT-2 and cited the programme's ability to draw increased attention to endemic zoonosis, to AMR for animal health and to the use of antimicrobials in food animals.

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<sup>26</sup> The continuing partnership with USAID under EPT-2 and GHSA, signed in 2015, allowed FAO to expand ECTAD's network and establish technical teams in 14 countries in Africa, coordinated by two sub-regional units in Accra and Nairobi, while maintaining its important hub in Bangkok (information from interviews).

164. However, informants reported significant tensions between EPT-2 and ECTAD more generally when it came to EPT-2 programme coverage. The latter is primarily decided by the donor, both geographically and technically. Countries and regions with ECTAD offices have benefited directly from EPT-2 funding and support, while very few countries that lack a stable ECTAD presence (such as the Philippines, Nigeria<sup>27</sup> and Timor-Leste) saw any substantive ECTAD expertise from ECTAD regional teams. ECTAD's obligations to the donor are paramount, but there are also major unmet needs in non-EPT-2 countries. When addressing emerging zoonotic diseases and transboundary animal diseases, plugging coverage gaps can be crucial to effective control. However, no recent evidence of a programmatic approach to scaling up coverage was observed.
165. The EPT-2 programme was cited as an example of longer-term funding secured by ECTAD for integrated regional and national prevention work (FAO, 2018b), through which ECTAD successfully demonstrated the importance of shifting the emphasis from dealing solely with short-term emergency response to using the emergency as an opportunity to build capacity and systems for the prevention of and preparedness for future emerging threats. The donor, USAID, recognized that this approach had resulted in reducing the risks from a range of threats and could be extended more widely. However, the overall impact has been limited geographically, as countries in Latin America, Eastern Europe and Central Asia receive little direct benefit from ECTAD, as they are not targeted by EPT-2.
166. Thanks to the resources provided by EPT-2, ECTAD was home to the only animal health and livestock development professionals in FAO offices in a number of countries. Examples include Sierra Leone and Nigeria (although the latter was only for a short period due to lack of funding). Other countries, where livestock professionals had been posted to FAO offices, benefited from additional expertise in animal health, One Health and zoonotic diseases. In all of the African countries visited by the evaluation team, ECTAD had been integrated into the country team and was playing a wide-ranging role in animal health: for emergency response, zoonotic disease prevention and control, One Health, AMR and other aspects of livestock development, including, but not limited to, the development of concept notes and proposals for resource mobilization. In the United Republic of Tanzania, for instance, the ECTAD team was involved investigating an aflatoxin outbreak and later developed a programme for its control.
167. ECTAD's capacity to move quickly is supported by a high number of short-term contracted technical experts. Consultants on short contracts can increase programme flexibility. However, the evaluation team was advised that constraints on consultant salaries set by FAO headquarters were sometimes making it impossible to recruit experts with significant or specialized experience. This was seen as a false economy. The cited downsides of the consultant model included reduced capacity to represent FAO to policymakers, an unwillingness to work for ECTAD if contracts were short and a lack of administrative authority. Regular programme technical staff reported being inundated with administrative tasks and managing large numbers of very small projects, such as Technical Cooperation Programmes, making them unable to fully utilize their own technical expertise and experience. Excessive delays in Regional Office approval of Country Office plans and

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<sup>27</sup> Nigeria benefitted from the presence of an ECTAD Animal Health expert (funded through EPT-2 and other small projects) for 18 months between 2016 and 2018. After this period, no funding was made available to continue the implementation of these activities, also due to a lack of donor interest in the country (Nigeria was no longer considered a priority country for USAID after 2018).

reports were mentioned as examples of how the model negatively affected programme efficiency.

168. Interviewees frequently cited procurement delays, for example in laboratory equipment and reagents. Upon investigation of particular purchase orders and items, it transpired that some of these delays were linked to GHSA and, therefore, outside the scope of this evaluation, or due to local procurement parameters in Country Offices. Delays in the delivery of PPE equipment and reagents from Dubai were discussed in Section 3.2.1.3, and key lessons have been learned and delays have been reduced over time.

### **The future direction of EPT-2 and ECTAD**

**Finding 23. ECTAD’s work has evolved and grown in importance and scope thanks to EPT-2 resources. However, there is little evidence of a commensurate increase in attention being paid to defining how ECTAD fits into NSA’s vision or functional relationships, or the potential financial investments needed to optimize coverage, outcomes and impact – not just for EPT-2 as a programme of work, but also for NSAH.**

169. When it was established, ECTAD’s role was to coordinate international efforts enabling countries to control the spread of HPAI, working in collaboration with OIE and WHO, to facilitate improved synergy at the regional level and accommodate specific needs at the national level. ECTAD supported the early detection and response to HPAI and provided technical inputs by building national capacity (FAO, 2008). Today, and thanks to the EPT-2 programme, ECTAD’s role has broadened to raising the profile of zoonotic disease and increasing overall capacity to prevent, detect and respond to both zoonotic and non-zoonotic disease outbreaks at source using a One Health approach. At the heart of EPT-2 and GHSA, it incorporates AMR objectives, the emergency global equipment stockpiling programme, and biosafety and biosecurity components, in line with FAO’s 2011 One Health Action Plan (FAO, 2011) and the AMR Action Plan 2016–2020 (FAO, 2016e). Through EPT-2’s component on ASL 2050, ECTAD has also provided NSAL with a vital conduit for engaging with national steering committees and regularly consulting with a multitude of other stakeholders on livestock-sector development and policy.
170. With long experience in implementing large animal health and related programmes, including EPT-2, ECTAD teams at global, regional and country level are also familiar with the complex geographic and cross-sectoral challenges (animal, public and environmental health, policy planning, communications and advocacy, as well as interactions and coordination) of working with national institutions, regional and international organizations and resource partners.
171. As noted in the EMPRES evaluation (FAO, 2018b), while officially considered an operational arm of EMPRES, ECTAD has been managed (and funded) separately to EMPRES-AH. It can grow or shrink rapidly depending on donor funding. For example, when ECTAD was established, it was to have regional offices throughout sub-Saharan Africa (for Western, Eastern and Southern Africa), in the Middle East, North Africa, Meso-America, East and

Southeast Asia. Several of these offices (five out of eight) have been forced to close due to a lack of funding.<sup>28</sup>

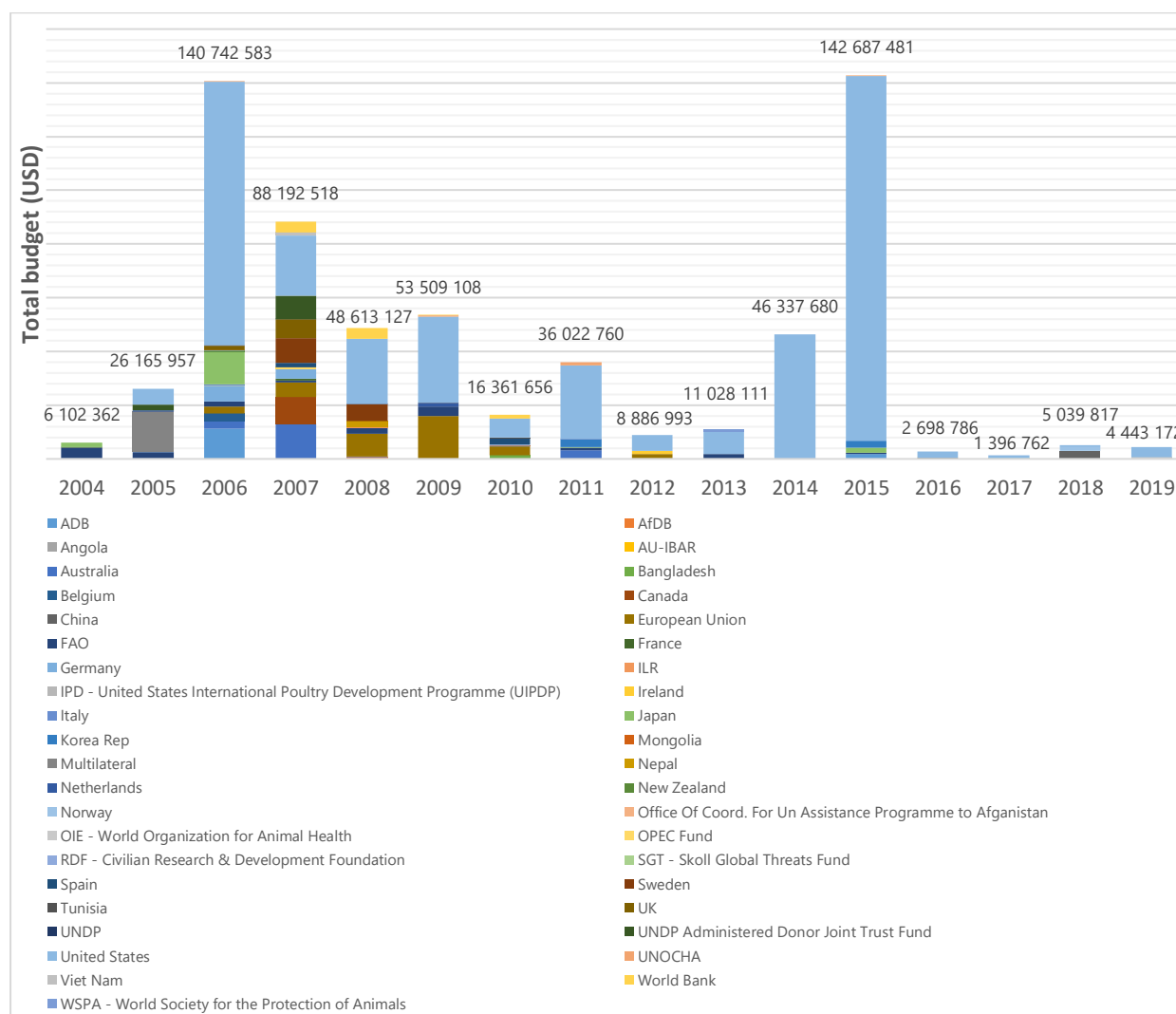
172. While benefiting from some regular programme contributions and the multidisciplinary nature of its staff at headquarters and in some Country Offices, ECTAD's work relies predominantly on extrabudgetary resources. USAID resources, in particular, have provided critical support and sustained ECTAD teams at national and regional level since 2006. Currently, the ECTAD programme employs more than 300 people in three regional offices and 31 countries in Asia and Africa, all funded through USAID's EPT-2 and GHSA programmes. Most of ECTAD's funding between 2014 and 2019, around USD 122 million, has been channelled to EPT-2, with the balance primarily going to implement GHSA in Africa (about USD 50 million), as can be seen in Figure 10. Consequently, ECTAD is a major actor among the numerous components of NSAH.
173. Overall, ECTAD's links to PSE (now OER) have fuelled its operational success and mobilized resources, such as EPT-2 and GHSA funding, for its major disease control activities. To understand ECTAD's main resource partners, the evaluation attempted to map the resources it has mobilized since its establishment. Although the data used in this analysis are not comprehensive,<sup>29</sup> the trends shown in Figure 10 remain relevant.
174. Between 2004 and 2015, ECTAD's funding came from a range of international partners. USAID's contributions have been substantial over the years, particularly to projects on HPAI and EPT. From 2015 to 2019, the major source of ECTAD funding was the EPT-2 and GHSA projects.

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<sup>28</sup> Since 2013, all regional and country ECTAD offices have seen a decline in funding, except for the ECTAD unit in RAP, which is managing a large avian influenza programme with USAID funding. In 2011, the ECTAD Regional Office in Beirut closed down due to lack of funding, followed in 2012 by the closure of the ECTAD Offices in Gaborone and in Panama. The Government of Lebanon wrote to FAO requesting that it maintain the activities of ECTAD in Beirut and expressed its willingness to share running costs. All attempts by FAO to keep the office open were unsuccessful and it was closed in 2011 (FAO, 2018b).

<sup>29</sup> The data used are based on information downloaded from FAO's Field Programme Monitoring Information System (FPMIS) and labelled/coded/qualified as ECTAD. Still, cross-checking with other information, there is evidence of projects that have been left out despite being implemented by ECTAD (such as an AMR project of about USD 10 million funded by the Fleming Fund and few smaller projects from other donors).

**Figure 10: Resources mobilized by ECTAD between 2004 and 2019**



Source: FPMIS as of June 2020.

175. ECTAD’s continued success in raising extrabudgetary funding, such as that from EPT-2 and GHSA, has enabled FAO to strengthen its animal health capacity, particularly at national level. However, there appears to be an over-reliance on goodwill to get the job done, which may have diluted FAO’s ability to fully utilize the expertise and resources that EPT-2 has undoubtedly brought. Indeed, although ECTAD’s roles have broadened considerably in recent years, it seems its full potential is still not being fully realized.
  
176. FAO key informants said they are exploring new collaborative mechanisms to build more sustainable capacity in disease prevention and management in “hot-spot” low- to middle-income countries and regions, capitalizing on the success of the HPAI and the EPT/GHSA programmes and learning from the challenges involved. Over the past year, FAO, USAID, Defense Threat Reduction Agency (DETRA) and other partners have been discussing the establishment of a multi-partner platform to help consolidate existing partnerships and enhance the sustainable delivery of programmes. The partners believe it would be beneficial to forge functional partnerships with regional entities (such as the African Union [AU] and, in particular, with the newly established AU/Africa CDC) to support sustainable capacity-building on the continent by making it a true One Health institution. Both USAID and DETRA

have shown interest in supporting the initiative and synergizing efforts, but other partners have yet to get involved.

### 3.4 Sustainability of intervention results

**Finding 24. EPT-2 initiated a course of action to sustain the actions and results achieved, particularly through capacity development, but additional effort is needed. While the programme successfully built capacity at the individual and organizational level, it rarely succeeded in creating an enabling environment by securing national investment or policy change to scale up or take full advantage of the training given and capacities developed. Nor did EPT-2 facilitate significant policy advocacy work.**

177. EPT-2 programme design predates USAID’s 2019 policy framework on “ending the need for foreign assistance”, which puts what USAID calls the “journey to self-reliance” at the forefront of its approach (interviews; USAID, 2020). The framework fosters capacity and commitment in partner countries at all levels – individuals, communities, and governing institutions – so that they can eventually solve their development challenges without external support. USAID interviewees observed that building capacity to prevent, detect and respond to pandemic threats using a One Health approach was EPT-2’s primary focus. Longer-term commitments to sustain these efforts (self-reliance) at national level were secondary and could be addressed once capacity, including awareness of the problem, was in place. This view appears to be corroborated by the 2018 USAID mid-term evaluation report of EPT-2 (USAID, 2018).
178. Capacity development is a core function of FAO’s Strategic Framework, representing a key to sustainable results at country level and ensuring that FAO’s efforts lead to lasting change. FAO’s Capacity Development Framework states that a country will only reach its development goals by strengthening its individuals and organizations while creating an enabling policy environment (Figure 11) (FAO, 2010).

**Figure 11: FAO’s capacity development dimensions**



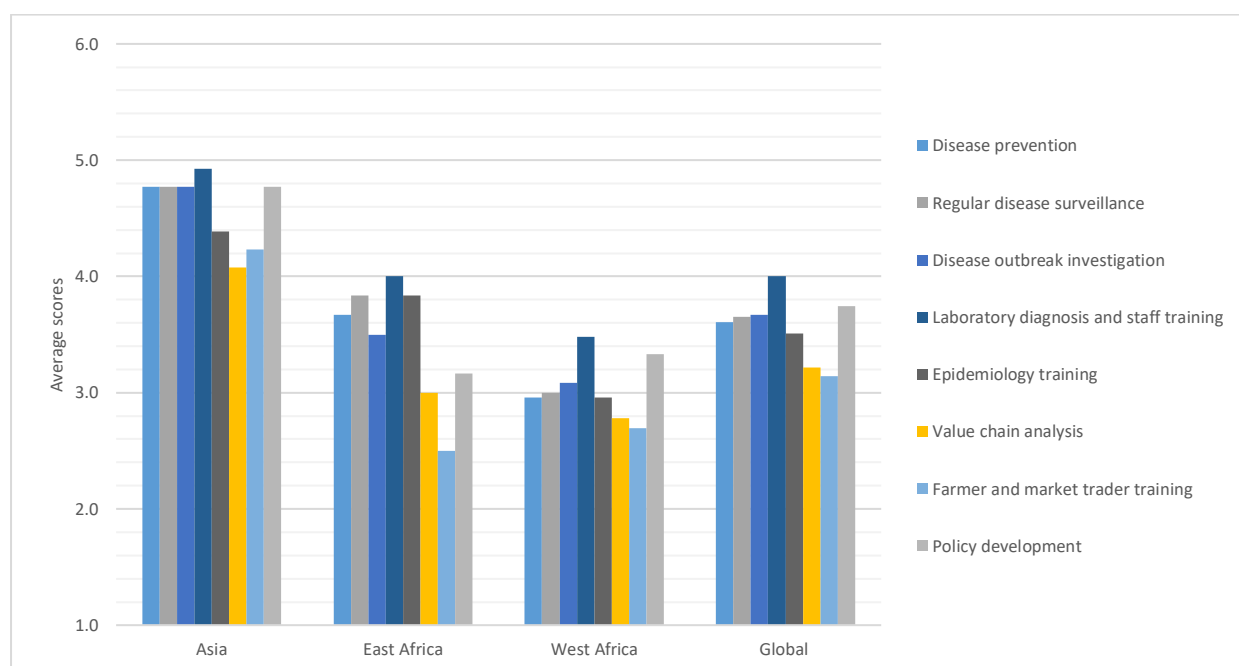
Source: FAO Corporate Strategy on Capacity Development 2010.

179. Extensive training programmes were undertaken in all EPT-2 target countries. Training has been aimed at staff, in particular, to improve the reliability of laboratory testing, epidemiology skills at various levels and the use of risk analysis to better target surveillance.

There is significant evidence of highly effective capacity-building within animal health laboratories (see Section 3.2 on effectiveness). As mentioned, there has been a significant increase in capacity to test samples nationally, particularly in countries with long-term ECTAD involvement. Laboratories in many countries are now ISO 17025 accredited for the diagnosis of priority zoonoses and major animal diseases. Key factors in this success included the step-by-step capacity-building programme design, which takes evidence from assessment tools, including LMT, ATLASS and the Surveillance Evaluation Tool (SET), to identify gaps and areas requiring regular training. EPT-2 attempted to communicate to policymakers the results of capacity being built by funnelling the information through epidemiology experts and laboratory directors at Regional Epidemiology and Laboratory Networks meetings. The Global Laboratory Leadership Programme was also used to promote coordination, cooperation and upgrades of national laboratory systems, plus a competency-based programme to strengthen laboratory workforce development. However, no evidence was found of how these EPT-2 results had been used or built upon by policymakers at national level.

180. Nonetheless, EPT-2 remains an important source of reagents for laboratory diagnostics and surveillance in much of Africa and parts of Asia. The evaluation team spent significant time investigating why government laboratories and departments continued to rely on FAO for their supply and the explanations centred on a lack of funding and lengthy bureaucratic procurement processes. For instance, government departments in Africa are highly reliant on EPT-2 for rapid outbreak investigation support due to their own internal delays. National veterinary service interviewees were very appreciative of FAO's willingness and capacity to support outbreak investigations at short notice, as it would take far longer to raise government resources to respond. Also, the complexities of cost recovery for routine surveillance work is considered an issue, as enabling policies and institutions needed to support the retention of any income derived from service provision were virtually non-existent in the countries visited. Laboratories were highly reliant upon annual budget allocations, which varied from year to year and were always below requirements. Complexity and inconsistencies were noted in Egypt, in particular, where even with modern equipment and a high level of expertise, there was reliance on FAO for the supply of reagents. Concurrently, however, the government was investing in new infrastructure and equipment needed for avian influenza vaccine efficacy testing.
181. External survey respondents were asked to score their government capacity to maintain FAO-supported interventions if EPT-2-funded FAO support ended. There was little variation in average scores across the different areas of work, with value-chain analysis and farmer and market-trader training the weaker points. However, there was substantial differences between the three regions, especially between Asia and West Africa (which could also reflect FAO's longer engagement in Asia than in West Africa). Figure 12 presents the average scores given by government respondents in the three regions.

**Figure 12: External survey – capacity to operate without EPT-2 support, average score by region**



Source: Internal survey responses, analysed by the evaluation team.

182. To sustain developed capacity, EPT-2 made good use of new technologies, mobile apps and global tool development. Examples include the pen-side PCR being piloted in Viet Nam, which saves on transportation time, reduces the cost of getting initial diagnostic results and allows the veterinary authority to take immediate action to contain disease spread; the EMA-I smartphone app linked to EMPRES-i to collect disease information; assessment tools such as LMT, ATLASS and JRAs; and the newly developed assessment tools for antimicrobial residues and surveillance.<sup>30</sup> In those countries that elected not to utilize EMA-i, but to retain national systems, ECTAD proved flexible in supporting system upgrades.
183. FETPV and other programmes<sup>31</sup> were also adopted with a view to ensuring the development of more long-term epidemiology skills at country level. In Southeast Asia, EPT-2 and CDC supported a master's FETPV programme at Chiang Mai University in Thailand. This programme has been running for several years, with participants from across the region, and has provided good training in higher-level epidemiology skills. Many countries have developed their own approach to boosting epidemiology skills, though largely at a lower level.<sup>32</sup>

<sup>30</sup> FAO SET is being used in Africa and was developed through GHSA. It identifies and prioritizes surveillance weaknesses and brings stakeholders together to develop action plans for high-impact, low-cost improvements.

<sup>31</sup> FETPV training in Africa has been labelled In-Service Applied Veterinary Epidemiology Training (ISAVET) and is funded by GHSA.

<sup>32</sup> For example, in China, FETPV has trained 176 government staff and 'rollout' training by FETPV alumni has been provided to more than 13 000 Chinese veterinarians. FETPV alumni reportedly supported the development of the national five-year plan for animal health and subsequent national and subnational animal disease action plans. The FEPTV network has also supported the response to various animal health emergencies in China, including H7N9, PPR and ASF. Furthermore, China's recognition of the value of FETPV training resulted in a cost-share mechanism, whereby the Chinese government took on increasing levels of financial and managerial responsibility. China eventually covered 50 percent of the total cost.



184. While EPT-2 was more focused on developing national capacities and less focused on facilitating long-term enabling policy and investment in preparedness for pandemic threats, there was evidence of policy progress, particularly where national or regional political will was evident and with regard to epidemiological strategies, AMR policy and One Health platforms. The Government of Viet Nam, with support from FAO, also developed a sustainability plan, through which it will implement a series of activities (using provincial funds after 2020) to roll out EPT-2-assisted training and models to improve production biosecurity and traceability (for example, maintaining nationwide survey, the wildlife farm database, the live bird market database and the Viet Nam Animal Health Information System), for integrated and coordinated surveillance, cross-border meetings and technical exchanges, and to ensure safer trade and animal movement. Regionally, ECTAD helped to create a positive dialogue environment by facilitating collaboration on transboundary animal diseases and emerging infectious diseases between China and the Lao People's Democratic Republic, Myanmar, Viet Nam, Mongolia and the Russian Federation. Multilateral collaboration mechanisms between China and other countries in the Southeast Asian region have reportedly led to greater mutual trust and use of a combination of epidemiological, social and economic approaches to understanding the potential risks and reducing the risk of disease transmission. Collaborative progress has been made in several areas, while communication between neighbouring countries and governments has been strengthened. For example, a South-South Cooperation project on transboundary animal disease control in the Greater Mekong sub-region was signed in July 2018. Again, though, the results and gains achieved through EPT-2 and the technical, social and institutional capital developed at national level can only be sustained with investment from national governments, policymakers and relevant stakeholders.
185. Thanks to EPT-2 resources and in collaboration with OIE, WHO and other consortium partners, FAO has helped to sustain national One Health capacity. There are numerous examples of FAO facilitating health, agriculture and environment ministry meetings and exchanging information on particular diseases (such as MERS-CoV, HPAI, rabies and anthrax) and challenges (AMR, wildlife trade and farming), thereby raising awareness of their complementary roles, responsibilities, expertise and experience, as well as resources needed (see Section 3.2.3). Most countries now have some sort of One Health coordination mechanism and several governments have invested to ensure their continuity (Kenya, the United Republic of Tanzania, Cameroon, Bangladesh, Indonesia, Viet Nam and Thailand, for example).
186. EPT-2 engagement with the private sector to support sustainability barely progressed beyond farmer and market-trader consultations and training. There appeared to be no strategy to engage with industry bodies to advocate for policy or institutional change. Limited efforts in this area were noted in the context of ASL 2050 in Egypt and Bangladesh. As part of the internal FAO survey, respondents were asked to list key partnerships. Regional bodies and the private sector featured low on the list.

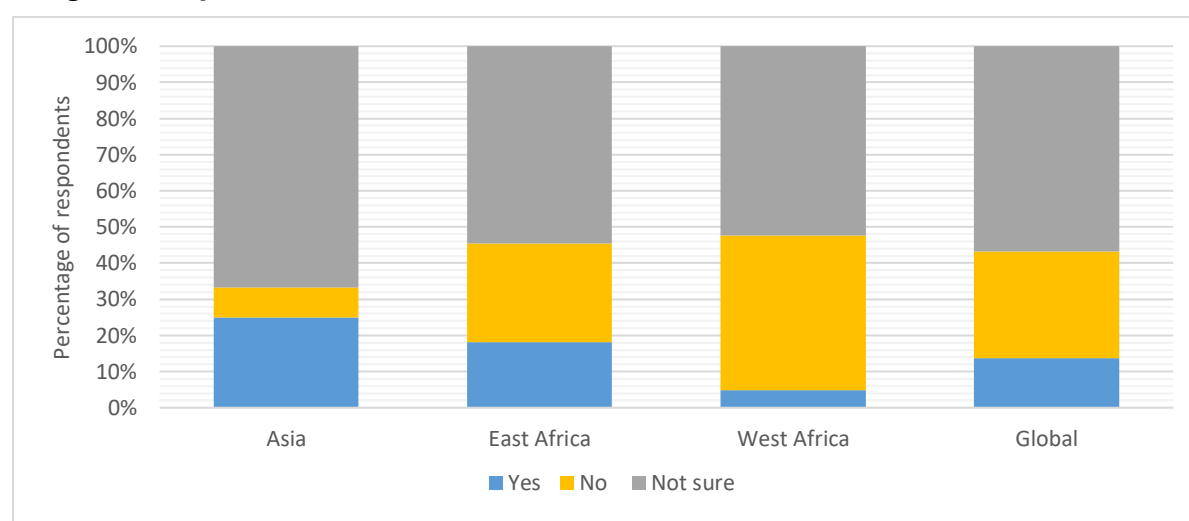
## 4. Cross-cutting issues

### 4.1 Gender

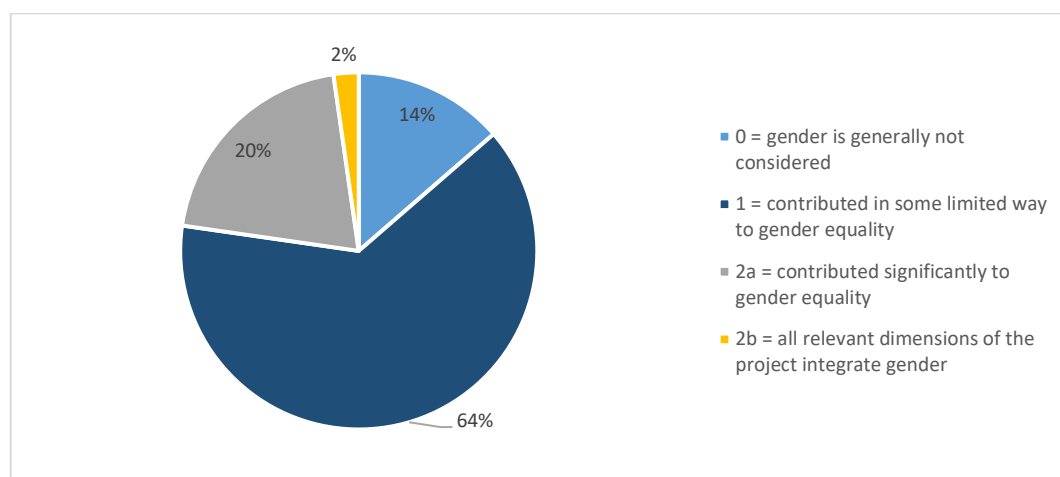
**Finding 25. While FAO Country Offices implementing EPT-2 include gender action plans in Country Programming Frameworks (CPFs) to address gender gaps, the evaluation found that ECTAD has not paid adequate attention to gender integration in its planning, implementation and reporting.**

187. Both USAID and FAO are committed to promoting gender equality and women's empowerment through their gender policies (USAID, 2012; FAO, 2013b). Their respective policies expect that all the programmes undertaken by USAID and FAO systematically study and address any relevant gender issues and gaps. Since EPT-2 planning began in 2014, gender has been a mandatory cross-cutting theme at FAO.
188. At the start of the programme, USAID asked FAO to identify gender issues and design specific interventions aimed at reducing gender gaps in access and benefits. However, there is no evidence that any project-wide or country-specific gender strategy was drafted to guide implementation. USAID offered the support of its gender expert, who visited FAO in 2018 and emphasized the need to work with a gender perspective. ECTAD piloted more detailed "gender" activities, but found they required both financial and human resources, especially gender experts. Barring Egypt and Bangladesh, there is little evidence of gender analysis or systematic considerations given to gender issues in planning interventions. Eleven out of twenty projects under EPT-2 were not assigned any gender markers. There was limited (Egypt, Ghana) or no (Bangladesh, the Lao People's Democratic Republic, Viet Nam) involvement of Gender Focal Points in EPT-2. No systematic gender assessment had been carried out for the programme. In addition, in the evaluation survey, 86 percent of respondents said they were either not sure whether a gender review had been conducted or that no gender review had been conducted.

**Figure 13: Internal survey – "Were systematic gender reviews conducted to inform EPT-2 design and implementation?"**



Source: Internal survey responses, analysed by the evaluation team.

**Figure 14: Internal survey – EPT-2 ratings from a gender-focused perspective**

Source: Internal survey responses, analysed by the evaluation team.

189. A gender stocktaking survey carried out in 2018 to guide NSA in its efforts to achieve gender equality recommended that good practices be systematic at all levels, complete with sex-disaggregated data and a gender-sensitive M&E framework. It recommended that training, workshops, seminars and e-learning materials contain a gender perspective. Online gender equality training became mandatory for all FAO staff in 2018. However, no EPT-2 staff interviewed recalled receiving any gender orientation or training. As EPT-2 was a technical project, gender was not deemed a material issue.
190. EPT-2 monitoring did not include reporting on core gender objectives, while sex-disaggregated data was limited to outreach levels, such as the number of male and female trainees.
191. Some countries reported making explicit attempts to improve gender balance among project technical staff (such as Bangladesh, Cambodia and the Lao People's Democratic Republic), which helped improve access and benefits for women farmers and market traders. In Bangladesh, interviewees and project document reviews identified poor gender balance among technical and programme staff as an issue in the initial EPT-2 situational analysis in 2016. The project team facilitated affirmative action through the Department of Livestock and Bangladesh Agricultural University. In the last three years, proactive efforts have resulted in the recruitment of women across activities, particularly in *upazila* clinics, and improved gender balance. There is a positive difference in women farmers accessing clinics, the early reporting of symptoms and treatment compliance wherever veterinarians, compounders and even administrative staff are women. The university has seen a substantial increase in female veterinary science students, thanks to an increase in women professors and hostel facilities for girls; at the time of writing, it estimated that 50 percent of enrolments for 2020 were women. This is a significant achievement. In Cambodia, women were reported to have engaged in a multi-sectoral collaboration for the safe sale of live and slaughtered poultry, including talks on upgrades to and legal frameworks for the live bird market.
192. Recognizing that women play a greater role in some aspects of livestock management, particularly poultry, but have poor access to information, training, services and markets, some women-specific interventions were implemented in the Lao People's Democratic Republic, Viet Nam, Bangladesh and Egypt, such as training women as vaccinators,

surveillance agents and in safe slaughter for home consumption. However, targeting women is not the same thing as gender mainstreaming, nor does it make a project gender inclusive. It is important to explain the rationale behind focusing on women, how the interventions will help to alter gender relations and create greater access and benefits for both women and men. The women-specific interventions in EPT-2 engaged women as efficient agents of change and delivery rather than to reduce gender gaps. The latter should ultimately help achieve greater resilience. As no gender-sensitive outcomes or indicators were planned, these interventions potentially placed a greater burden on women without allocating responsibility to men. Interventions aimed at women's empowerment need to create a supporting environment and be reflected in greater autonomy, choices, decision-making and effective participation in governance, not just expand or add new roles that may create an additional burden. Such a perspective was not observed.

193. Gender integration means responding to the different needs, interests and priorities of all sections of society, not just women, so that there are equal opportunities and rights for all. Aside from some MERS-CoV activities among camel-owning pastoralists in the Horn of Africa, there was little evidence of any efforts to include minority, tribal or disadvantaged communities and/or underprivileged sections of the community. There might have been scope to engage unemployed youth and men to perform certain critical roles in livestock management, such as the disposal of dead bodies, wild animal hunting, tanning and marketing, which would have indirectly freed up women to take care of other responsibilities.

**Table 2: Gender markers on EPT-2 projects**

Project symbol	Gender marker	Reporting start year	Reporting end year
OSRO/BGD/505/USA	G2a	2015	2019
OSRO/CMB/401/USA	Not available	2014	2019
OSRO/CPR/401/USA	Not available	2014	2019
OSRO/EGY/501/USA	Not available	2014	2019
OSRO/GLO/302/USA	Not available	2014	2019
OSRO/GLO/407/USA	Not available	2014	2019
OSRO/GLO/501/USA	Not available	2015	2019
OSRO/GLO/504/USA	G2a	2015	2019
OSRO/GLO/505/USA	G2a	2015	2019
OSRO/GLO/506/USA	G2a	2015	2019
OSRO/GLO/508/USA	G2a	2015	2019
OSRO/GLO/602/USA	G2a	2016	2019
OSRO/INS/501/USA	Not available	2015	2019
OSRO/LAO/401/USA	Not available	2014	2019
OSRO/MYA/501/USA	G1	2015	2019
OSRO/NEP/401/USA	Not available	2014	2019
OSRO/RAS/402/USA	Not available	2014	2019
OSRO/RAS/502/USA	G1	2015	2019
OSRO/RAS/606/USA	G1	2017	2019
OSRO/VIE/402/USA	G1	2014	2019

Gender markers:

G-0: does not address gender equality.

G-1: addresses gender equality only in some dimensions

G-2a: addresses gender equality in a systematic way, but this is not one of its main objectives

G-2b: The P/S or Activity addresses gender equality and/or women's empowerment as its main objective

## 4.2 Monitoring and evaluation

**Finding 26. Due to changes in EPT-2 SAFs, programme M&E was multi-layered and complex. The evaluation team commends the excellent work done by the FAO EPT-2 M&E unit in developing a M&E framework for the whole programme. M&E officers in national and regional offices were found to be capable and well supported by the headquarters-based unit. Still, the evaluation also found feedback from the global M&E framework to be of limited use for country-level learning. A robust and coordinated effort has been underway since 2019 to develop methodologies and tools to assess the programme’s contribution to countries’ progression against the JEE.**

194. EPT-2 was originally designed to work towards seven SAFs, split between the EPT-2 consortium partners. However, in late 2015, the focus of the whole programme shifted to the GHSA packages and a new M&E framework was needed. At the same time, there was no single programme proposal for EPT-2, as implemented by FAO; rather, it was a conglomeration of 20 projects. The projects were run separately through FPMIS, each with a specific code, project document and logframe. Progress monitoring has, therefore, had to operate on two levels with two sets of indicators. One set of indicators, in earlier project log frames, was orientated toward the original SAFs and varied somewhat from project to project and country to country. The key outliers were ASL 2050 and AMR projects, as their indicators did not easily align with those of EPT-2’s core business.<sup>33</sup> Another set of indicators was used for all EPT-2 consortium partners and formed the M&E framework (Figure 15) for the whole USAID-funded programme.<sup>34</sup> The two sets of indicators did not always align, and regional or national M&E officers had to provide guidance on how to report project outputs using the framework’s proxy indicators. Performance indicator reference sheets (PIRS) for the M&E framework, in the USAID format, came into effect in August 2016 and were revised regularly thereafter.

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<sup>33</sup> AMR indicator data are orientated towards JEE.

<sup>34</sup> USAID tasked FAO’s EPT-2 monitoring and evaluation unit with formulating the monitoring and evaluation framework for the whole consortium in October 2015. A consultative approach with consortium partners facilitated the agreement of an overall theory of change narrative (see Box 1), three main objectives, six sub-objectives, 30 indicators and programme partner responsibilities.

Figure 15: Overarching M&E framework for EPT-2

<b>Emerging Threats Division (ETD) Performance Indicators (through Sept 30 2019)</b>		
<b>Goal: Reduced risk and impact of emerging pandemic threats, applying a One Health (OH) approach</b>		
<b>Objective 1: Systems for prevention, detection and response strengthened</b>	<b>Objective 2: Workforce capacity for OH strengthened</b>	<b>Objective 3: Enabling environment for multisectoral collaboration strengthened</b>
<ul style="list-style-type: none"> <li>a) #, list of recom'ed risk mitigation approaches implemented and/or scaled up (FAO)</li> <li>b) Median # of days from sample collection to initial test result to report (outbreaks) (FAO)</li> <li>c) #, % of labs improving quality assurance and safety procedures (FAO, P2, WHO)</li> <li>d) # of countries with formalized surveillance protocols for prioritized zoo. diseases (FAO)</li> </ul>	<ul style="list-style-type: none"> <li>a) #, list of new OH education and field training programs (OHW, FAO)</li> <li>b) Evidence of application of OH trainings and sensitization in the workforce (qualitative) (OHW, FAO, P2)</li> </ul>	<ul style="list-style-type: none"> <li>a) Evidence of national/regional coordination mechanisms (NOHPs, OHUNs) showing improved capacity (qualitative) (OHW, P&amp;R)</li> <li>b) List of global, regional or country strategies under implementation (qualitative) (FAO, OHW, P2, P&amp;R, WHO)</li> <li>c) # countries committed to develop and implement a (national) lab policy (FAO)</li> </ul>
<p><b>Output 1.1:</b> Evidence base for prevention strengthened</p> <ul style="list-style-type: none"> <li>a) #, list of countries with concurrent sampling (P2)</li> <li>b) List of viral, bacterial, or other disease risk pathway models or maps developed and/or refined (FAO, P2)</li> <li>c) #, list of characterized risk factors or interfaces associated with spillover, amplification and/or spread (P2)</li> <li>d) List of intervention points prioritized for development of risk mitigation approaches (P2)</li> </ul> <p><b>Output 1.2:</b> Mechanisms for detection and response strengthened</p> <ul style="list-style-type: none"> <li>a) #, % labs able to perform EPT2/GHSA prioritized testing, # of tests performed (FAO, P2, WHO)</li> <li>b) # of target (African) countries that shipped influenza specimens to WHO-CCs (WHO)</li> <li>c) #, list P&amp;R plans developed/ revised (FAO, P&amp;R)</li> <li>d) #, list of exercises or after action reviews conducted (FAO, P&amp;R)</li> <li>e) List/Description or outbreak responses supported (FAO, OHW, P2, P&amp;R)*</li> </ul>	<p><b>Output 2.1:</b> Education and training capacity to address OH workforce needs strengthened</p> <ul style="list-style-type: none"> <li>a) # of faculty members that received OH training or professional development (OHW, P2)</li> <li>b) #, list of publicly available educational, training, and/or implementation resources developed and shared (OHW, FAO, P2, P&amp;R)</li> </ul> <p><b>Output 2.2:</b> Core competencies of future and current OH professionals strengthened</p> <ul style="list-style-type: none"> <li>a) # of future professional trained (OHW, P2)</li> <li>b) # of OH fellows placed (OHW, P2)</li> <li>c) # of current professionals trained (OHW, FAO, P2, WHO)</li> </ul>	<p><b>Output 3.1:</b> National/Regional OH coordination mechanisms strengthened</p> <ul style="list-style-type: none"> <li>a) #, list of new NCMs/NOHPs established (P&amp;R)</li> <li>b) #, list of new member schools added to OHUNs (OHW)</li> </ul> <p><b>Output 3.2:</b> Advocacy and communication to advance OH practices and policy improved</p> <ul style="list-style-type: none"> <li>a) #, list of evidence-based informational resources developed or refined (OHW, FAO, P2, P&amp;R, WHO)</li> <li>b) #, list of community OH events coordinated (OHW, FAO, P2)</li> </ul>

19 July 2018

Source: Evaluation team (Emerging Threats Division Global M&E Framework).

195. Key informants (ECTAD CTLs and staff, including M&E field staff) consistently reported that the M&E system was excessively complex and time consuming at the start of EPT-2. There was also common agreement that considerable effort had been made to streamline, clarify and train staff on how to report against the M&E framework in a timely manner. This was also reflected in the responses of the internal survey.
196. The recruitment of M&E officers within regional and sub-regional offices and, in some cases, Country Offices was seen as a key step. National M&E officers not only assisted technical staff with reporting and validation, but also improved the quality and timeliness of reporting and further reduced the need for validation missions from headquarters. The evaluation found a good level of professionalism among M&E staff based in the decentralized offices. They were also found to be capable in managing individual project log frames and indicators. They are a key asset that could be further strengthened and supported within ECTAD and FAO offices. Where M&E officers did not exist, ECTAD country team leads still found reporting against the M&E framework difficult, but said the modalities of reporting had improved over time. Significant lessons have been learned from this challenging M&E environment; they have been documented by the M&E unit and will be very useful in the design of an M&E framework for the next phase of EPT-2.

197. The evaluation team's review of six-monthly project reports generally showed a high quality of reporting. However, while these reports provided sufficient information to assess progress, the standard reporting format and process did not allow the full integration of progress and M&E reporting.
198. Aggregating the highly quantitative and output-orientated indicators (Figure 15) gives an idea of trends across the whole USAID programme, but these are of limited use to particular countries or regions. FAO's M&E team consequently attempted to use some of the M&E framework data to show FAO programme-level regional results and country performance using country dashboards. Annual data-collection rounds within FAO EPT-2 were followed by remote or face-to-face feedback and guidance sessions. Significant data validation was required. Meaningful data analysis only became possible in 2018, once countries' quality and volume of data reached an acceptable threshold. Regional meetings were then convened in 2018 and 2019 for data presentation and review.
199. Bearing in mind this high level of complexity, the FAO headquarters-based EPT-2 M&E unit did an excellent job of developing an M&E framework for the whole programme on behalf of consortium partners (OSRO/GLO/508/USA). This level of excellence was reflected in the considerable amount of consultation, training and feedback support provided to regional and national ECTAD and M&E officers to ensure FAO outputs and outcomes were captured by the broad and high-level indicators of the M&E framework.
200. Throughout the process, the M&E Unit has produced regular guidance documents, including user-friendly visual performance indicator reference sheets (PIRS), improved core indicator data collection tools, updated country and regional dashboards, collected case studies and recorded key lessons. These lessons included:
  - i. The inter-partner (global) M&E framework proved useful for portfolio reporting and learning, but had limited utility for national results monitoring and learning.
  - ii. Countries are encouraged to invest in strengthening country-level M&E systems so they can systematically compile, analyse and use specific strategic country-level output and outcome level results.
  - iii. National-level interest in M&E has increased and there is a greater desire to understand project performance and learn for improvement.
  - iv. Robust results monitoring systems are essential to fostering a learning culture at national, regional and global level.
  - v. There is a need to shift from proxies to more granular and multi-spectrum indicators to capture the depth of change within technical areas (for example, surveillance and laboratories).
  - vi. An EPT-2 learning agenda should be developed to complement the performance indicators and be embedded from the design phase through to the M&E, learning, planning and implementation stages.
201. Through a combination of peer-review and self-assessment, the JEE mechanism, launched by WHO in 2016, provides a systematic evaluation of a country's preparedness capabilities and infrastructure across 19 domains, enabling the identification of gaps and areas for improvement. The OIE PVS pathway assesses the quality of national veterinary services and animal health systems. Together, JEE and the PVS provide national governments with the

essential starting point for any initiative to improve preparedness: a detailed and objective assessment of current status against agreed benchmarks. While the PVS has links with some EPT-2 tools, such as the LMT, it has no clear links with the EPT-2 M&E framework and the JEE mechanism, which also measure gains in capacity development at national level.

202. As EPT-2 and JEE come from different funding streams withing USAID, the organization told the M&E team to keep the EPT-2 M&E framework separate from the JEE until 2019, regardless of the actual country work planning done using JEE indicators since 2017. In November 2017, however, in consultation with USAID, linkages between EPT-2 and JEE indicators were identified in participatory work sessions (involving regional managers, CTLs and M&E focal points) at an M&E consultation in Douala, Cameroon. The meeting spawned an agreement to continue using EPT-2 indicators for both GHSA and EPT-2 countries until further notice.

### 4.3 Communication

**Finding 27. The evaluation found the quality of communications efforts to be mixed, as there was no overarching EPT-2 communication strategy. Some communications appeared to succeed and a few innovative examples (in terms of new technologies and techniques) were found. However, there were no significant attempts to assess the effectiveness of communication materials distributed. In some countries, FAO, through EPT-2 resources, provided limited but effective support to regional and national partners to develop their own communications strategies and resources.**

203. Several of the original EPT-2 SAFs required effective communication, such as promoting practices that reduced the risk of disease emergence, supporting One Health platforms and strengthening national preparedness to respond to events.
204. Within the EPT-2 programme consortium, communications training, as a core competency for future and current One Health professionals, was assigned to OHW and PREDICT 2, with support from FAO and WHO. FAO provided limited but effective support to regional partners, as well as a number of national ones (in Cameroon, Togo and Egypt, for instance), to develop their own communications strategies and resources.
205. At headquarters, EPT-2 activities and results featured regularly in publications and web-based articles, such as:
- i. MERS-COV: a Food Chain Crisis fact sheet entitled *Dromedary Camels and MERS-CoV: Filling Knowledge Gaps* (FAO, 2017b);
  - ii. Avian influenza: Regular HPAI activity updates via EMPRES, such as *Addressing H5N1 HPAI qualitative risk assessment on spread in the Central African region* (FAO, 2016d), regular global avian influenza updates (for example, H5N8), along with links to support documentation, such as relevant media releases, manuals, brochures and guidelines (FAO, 2017b);
  - iii. RVF: A fact sheet for FAO's Food Chain Crisis publication, entitled *Real-time monitoring and forecasting of Rift Valley Fever in Africa* (FAO, 2019b);
  - iv. ASL 2050 established its own website, with approximately 70 documents available to download and an "in the media" section providing examples of ASL 2050 mentions in national media.



206. Regional and sub-regional offices produced a range of communications material, including awareness-raising slide shows and videos on AMR (FAO, OIE, WHO and UNEP, 2019). The ECTAD office in RAP supported ASEAN in producing its own regional AMR communications strategy. Regional offices also produced numerous papers and conference presentations, listed in the EPT-2 biannual reports.
207. Country Offices supported their partners in producing a range of communications materials and publications to raise awareness of programme achievements, though with mixed success. For example, widespread information campaigns on national television in Cambodia encouraged farmers to report poultry deaths, but these were considered ineffective after an informal review, as they failed to engage sufficiently with producers and to precipitate change.<sup>35</sup>

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<sup>35</sup> Another example: Egypt, produced large numbers of studies, brochures, booklets, flyers and scientific papers to publicize laboratory findings on avian influenza and other aspects of programme work in the country. One initiative produced videos to support the Exposure Reduction Programme for safe and contained poultry slaughtering in households to reduce human exposure to avian influenza viruses. Subsequent surveys showed that 43 percent of households followed the slaughtering steps correctly. The other major awareness campaign in Egypt was the delivery of biosecurity messages to key farmer and veterinary stakeholders through booklets and posters. However, assessment of this campaign showed relatively poor uptake, with just 30 percent of participating producers following the key messages.

## 5. Conclusions and recommendations

### 5.1 Conclusions

**Conclusion 1. The COVID-19 pandemic has significantly increased the relevance of EPT-2, as countries have been reminded of the gaps in their preparedness for emerging zoonotic diseases. First-hand understanding of the economic, social and health costs of a pandemic will increase and further enhance the value of EPT-2-style interventions as the COVID-19 pandemic progresses, fuels economic recession and disrupts the trade of agricultural products, risking another global food-price crisis. The next phase of the EPT-2 programme could take advantage of renewed national, regional and global interest in ensuring that the COVID-19 experience is not repeated. With robust review and some internal reorganization, FAO is in a strong position to consolidate the gains made through EPT-2 and to broaden the programme in terms of geographic coverage, scope and sustainability.**

208. FAO's EPT-2 programme objectives and its One Health approach have been viewed as highly relevant at all levels (global, regional and national). Its relevance has been maintained and enhanced by its flexibility, which has allowed ECTAD to broaden its scope of work over time to include endemic zoonotic diseases, support for transboundary animal disease outbreak control, AMR and, to a limited degree, wildlife trade in Asia, as well as through ASL 2050, broad livestock policy engagement in Africa.
209. With ECTAD's support for the implementation of EPT-2 activities, FAO maintains a significant comparative advantage in supporting member states, regional bodies and development partners in their efforts to address both zoonotic disease threats and transboundary animal diseases and in raising their epidemic preparedness. These advantages include its science-based approach to assessing risks and developing solutions; its in-country field presence and capacity to respond rapidly as part of a joined-up global or regional response; its oversight position in linking appropriate levels of monitoring; international legislative instruments and forums for discussion; and capacities for resource mobilization and coordination. Furthermore, FAO's independence and transparency allow it to act as an honest broker between development partners and member states in difficult situations and crises.
210. EPT-2 must be viewed as a long-term initiative. The USAID evaluation of the EPT-2 consortium concluded that the kind of changes required to fully address pandemic threats and develop One Health platforms is generational (USAID, 2018). The advancement of laboratory, surveillance and response systems, policy development and institutional strength varies considerably between countries. Asia is more advanced than Africa, but some countries in Asia still require considerable support.

**Conclusion 2. EPT-2 has largely achieved its objectives and outputs in terms of technical capacity development and disease strategy, but less so in terms of enabling policy, value chains and production. The latter will require a shift in EPT-2's approach towards greater policy engagement, with significant influence on EPT-2's impact and sustainability.**

211. EPT-2 has enhanced the role and visibility of FAO in animal health, AMR and One Health at country and regional level and among key partners. The overall design of EPT-2 was focused on technical capacity development and improved disease preparedness strategies.

212. In Asia, the prevalence of avian influenza has been reduced in some endemic countries and active surveillance systems, laboratory capacity and strategic response have improved. However, few countries are in a position to stop or slow virus reassortment or emergence. Many African countries remain highly reliant on FAO for rapid-response capacity and basic reagents.
213. FOA's EPT-2 work on MERS-CoV in the Horn of Africa, Egypt and Jordan built capacity that has benefited the management of transboundary diseases generally and supported the development of One Health platforms. By demonstrating that African MERS-CoV clades were unlikely to be zoonotic, FAO successfully secured camel value chains and supported livelihoods. However, countries remain highly reliant on FAO to continue surveillance and research to fully understand MERS-CoV epidemiology.
214. Greater advocacy of broader 'enabling' livestock policies could have been beneficial, to secure investment, upscaling and the sustainability of outputs and outcomes linked to EPT-2. However, staffing within ECTAD reflects its strong technical focus. People with the knowledge and skills to support advocacy, policy development and institutional strengthening were only found in the ASL 2050 initiative. Such activities were steered by NSAL, which has significant experience in this area. The success of ASL 2050 to date and its popularity at country and regional level is a good sign that the next phase of EPT-2 could do more in this area while encouraging national resource utilization and mobilization.
215. With enabling policy, strong institutions and national resource utilization and mobilization, more of the outputs and work piloted by EPT-2 could be scaled up. Significant foundational work has been carried out in terms of One Health partnerships, training curriculums, biosecurity models, standard operating procedures for outbreak investigations, surveillance/data management systems, specialist tool development and uptake, laboratory capacity-building, disease strategy development, planning and policy prioritization. These gains establish the foundations for realizing significant impact.
216. There appeared to be no overarching communications strategy at regional or national level to engage partners and assess the effectiveness of communications efforts.

**Conclusion 3. In line with FAO's 2011 One Health Action Plan (FAO, 2011), EPT-2's technical focus has strengthened traditional partnerships between FAO and technical livestock departments and ministries and built stronger collaborations with health and environment ministries. Regional partnerships have strengthened in Asia and ECTAD has both called on and assisted the Tripartite to support many aspects of EPT-2 work. EPT-2's partnerships with the private sector and civil-society organizations were more superficial.**

217. The fact that the EPT-2 programme design did not emphasize advocacy and policy interventions partly explains why partnerships with the private sector and civil society were of less consequence. These groups were sometimes consulted as stakeholders, but had no significant involvement in the programme. The programme did not engage directly with finance ministries and international finance institutions, such as the International Fund for Agricultural Development (IFAD), the World Bank, the Asian Development Bank (ADB) and the African Development Bank, but these could have a significant advocacy and partnership role in future. The World Bank had an important financing role in the HPAI response of 2006-2013 (Jonas and Warford, 2014).

218. FAO's external EPT-2 partnerships had a strong technical focus on the ministries responsible for animal health and One Health at national level, RECs, universities and reference centres, Tripartite sister organizations, USAID and other EPT-2 consortium partners. This specialist engagement reflects ECTAD's staff competencies. EPT-2 has been highly successful in developing technical plans and strategies for animal health at national and regional level, per its objectives. There is less evidence of high-level policy development or institutional change.
219. Partnerships with regional organizations in Africa were less robust than in Asia, largely due to regional body capacity and the fact that EPT-2 projects in Africa were less mature.
220. One Health platforms were strengthened and supported in all countries, with disease strategies frequently bridging a number of ministries. However, relatively few platforms are fully operational on disease surveillance and outbreaks for budgetary support and staffing reasons. The complexities of achieving such institutional change and functionality are well documented in both developed and developing countries.

**Conclusion 4. EPT-2 efforts to strengthen the sustainability of national systems to address emerging endemic disease and pandemic threats have focused on capacity development at the individual and organizational levels. The achievements to date form a solid basis for future sustainability. The policy, institutions and investments needed to keep laboratories, surveillance systems and outbreak investigations fit for purpose and adequately funded have yet to be fully developed in most countries.**

221. The sustainability of a programme requires sound financial investment to maintain progress, in addition to technical, social and institutional capabilities. While EPT-2 established strong technical capital in most project countries, the availability of requisite financial and social capital was less evident. These considerations aside, pandemic threats are unnervingly dynamic and uncertain, so require continued vigilance and pre-emptive actions. It is impossible to remain consistently alert without continued investment enabling countries to remain on the front line of threat monitoring and directed actions, if necessary. This calls for a harmonized and coordinated approach by both countries and development partners, especially taking into account the weakest situations and nations from which disease may emanate. It is unrealistic to expect the EPT-2 gains to date to be sustainable. Rather, it is necessary that the work done through EPT-2 be sustained through additional investments from both donor agencies, national governments and other stakeholders.
222. The ASL 2050 initiative provides an example of how EPT-2, with the support of NSAL, has started a robust policy development process with stakeholder mapping and engagement. Policy prioritization is ongoing and this creates a good foundation for future policy change that may support both sustainability and increased coverage.
223. EPT-2 has developed or facilitated the development of a significant number of support and assessment tools to improve the effectiveness and sustainability of disease prevention, detection and response mechanisms.
224. Value-chain analysis and risk-based assessment have supported the development of models that can improve biosecurity on farms and in markets if scaled up. Participatory disease surveillance has been advocated in countries such as Bangladesh and Egypt to

improve surveillance, but has yet to prove sustainable. This experience and lessons from it form a key support for the future prevention and detection of zoonotic disease threats.

225. Epidemiological skills developed through FETPV have started to form a solid bank of expertise and a resource for both countries and regions, strengthening One Health mechanisms, formulating disease control strategies and influencing policy. Examples of this in Viet Nam and China were commendable.

**Conclusion 5. EPT-2 has no explicit or consistent strategy to ensure gender analysis is undertaken or that the interests of women and disadvantaged sections of the population are integrated and addressed.**

226. Women were proactively encouraged to attend training sessions and some women-specific interventions were implemented in the Lao People's Democratic Republic, Viet Nam, Bangladesh and Egypt. There was also a limited amount of gender-orientated value-chain analysis. Whether and how the inclusion of women contributed to the core objectives of the programme (surveillance, early detection, better coverage, improved treatment compliance and disease control) remains unclear, but in some countries, it was significant.

227. FAO's own analysis shows that women constitute 43 percent of the rural workforce and make a significant contribution to food production for household consumption and sale. They also play a critical role in the early detection of disease and surveillance, as well as in ensuring safe food production. As the programme moves forward, it is vital that women and minorities are adequately considered in policy and strategy development.

**Conclusion 6. FAO's divisional collaboration (NSA and OER) to operationalize ECTAD and implement EPT-2 has been highly effective; it forms a major supporting component of FAO animal health and has the potential to grow in scope of work and coverage. This partnership makes an important contribution to FAO Strategic Objective 5 (increasing the resilience of livelihoods to threats and crises) and raises the possibility of additional support for other Strategic Objectives and greater policy engagement. It raises FAO's profile at all levels.**

228. ECTAD, with EPT-2 and GHSA funding, has become a crucial component of FAO's animal health capability. Without ECTAD staff, FAO would lose much of its comparative advantage on animal health at all levels.

229. The relationship between ECTAD staff and regular programme staff was partly clarified at Country Office level in a 2016 directive. However, terms of reference to set out how ECTAD staff engage with other national livestock project staff and with regional NSA staff have not yet been formulated. These complex working relationships have caused confusion, with ECTAD officers reporting technically to one person but administratively to another. Terms of reference would provide an opportunity for FAO to clarify ECTAD's scope of work and reporting relationships in decentralized offices. The seniority and continuity of regular programme staff could assist EPT-2 with the policy and institutional engagement lacking from the programme. While anomalies exist, the role of ECTAD within NSAH is slightly clearer, as most animal health components report to the Chief Veterinary Officer. Overall, there appear to be advantages and an opportunity to take a more programmatic approach and to review ECTAD's scope and coverage.

230. The main beneficiaries of EPT-2 have been the regions and countries with ECTAD offices, yet some benefits have accrued to countries where ECTAD is not present. Coverage should increase to all key regions and countries to fully address the future threat of pandemics and of zoonotic disease outbreaks. These will continue to increase unless significant interventions are made (Pike et al., 2010). Furthermore, limited geographic coverage is a major disadvantage when dealing with transboundary and emerging infectious diseases or global problems, such as AMR.
231. ECTAD's geographic coverage and technical scope are currently dictated by extrabudgetary project-based funding, including the 20 EPT-2 projects funded by USAID. This has advantages and disadvantages for FAO. On the one hand, FAO does not have to use regular programme funds for the majority of its technical and operational staff, allowing rapid expansion and shrinkage as needed. Utilizing short-term consultancy contracts, FAO can rapidly change staff competency to meet needs. On the other hand, the disadvantages include a lack of staff commitment amid a lack of job security and possibly the calibre of staff engaged. Consultants also have limited authorization levels and less capacity to represent the Organization at high-level policy forums and other strategic engagements.

**Conclusion 7. EPT-2's multi-layered and complex M&E system posed significant challenges for the M&E unit and ECTAD technical staff. Good progress was made in training, developing reporting templates and guiding an array of M&E officers at national and regional level. These staff have proved a valuable contribution to project monitoring and are a resource for other projects. Significant lessons have been learned on M&E modalities, which should lead to improved feedback and lesson learning in any future phase of the programme.**

232. FAO programme-level regional results and country performance dashboards are now in place and provide a basis for better feedback and learning as data handling improves across the programme.
233. The M&E framework developed by FAO in 2015–16 predated the GHSA and JEE. Linkages between the EPT-2 indicators and JEE indicators have been identified, but linking their respective indicators remains problematic.
234. The EPT-2 programme had no substantive theory of change, but a short version was used to help develop the M&E framework at global level (see Box 1). As a large and complex programme, EPT-2 could have made greater use of a theory of change to improve its effectiveness and better define pathways to achieving higher-level changes. For example, by defining long-term goals, EPT-2 could demonstrate how it affects SDGs and map backwards from particular outcomes in order to identify preconditions. A theory of change might also guide decisions on how to make adjustments to the programme by clearly showing the relationship between outcomes.

## 5.2 Recommendations

**Recommendation 1. As the COVID-19 pandemic has shown, the world is still unprepared for a pandemic, and threats such as avian influenza and MERS-CoV remain. Therefore, the evaluation team highly recommends that EPT-2 be continued and expanded.**

235. NSA and the OER should continue to work with EPT-2's main donor, USAID, to agree the scope of future work, building on the achievements of EPT-2. Every effort should be made to broaden both the funding base and programmatic focus of the next phase to increase

development assistance to those countries most at need and to ensure broader geographical coverage. COVID-19 has demonstrated the extent to which preventing another pandemic is a global public good.

236. The next phase of EPT-2 needs to address gaps in coverage in low- and middle-income countries, especially countries not covered by the programme, such as Somalia, South Sudan, most of southern Africa, Afghanistan, Papua New Guinea and Timor-Leste.
237. Building on its expanding knowledge of the drivers of pandemics and using a One Health approach, FAO should use its technical capacity and experience to step up analysis of the spill-over risks associated with the wildlife trade and encroachment of wildlife habitats.

**Suggested actions:**

- a. Given the zoonotic nature of SARS-CoV-2, investigations into potential animal hosts are of great importance, in order to improve our understanding of COVID-19 epidemiology and to identify sources of human infection. Field studies need to be undertaken in the short term, while virus circulation in humans is ongoing in different parts of the world. Embracing this challenge, FAO works with many partners, including WHO and OIE, to deploy a One Health approach.
- b. In particular, and working in close coordination with national authorities, FAO and WHO must raise the awareness of actors along the food supply chain when it comes to health regulations, including rights, roles and responsibilities of workers. This will better enable FAO, its partners and all actors along the food supply chain to ensure that they follow appropriate measures to reduce exposure and prevent COVID-19 transmission.

**Recommendation 2. ECTAD must maintain the network of valuable expertise it used to implement EPT-2 to ensure that the necessary technical support remains available and that countries, especially the most vulnerable, develop and sustain the enduring capabilities they need to effectively prevent, detect and respond early to disease threats before they become regional or global crises.**

238. While USAID has been an excellent development partner, its restricted mandate limits ECTAD's scope to certain countries and zoonotic diseases and does not include those that severely impact livestock production and are detrimental to livestock keepers' livelihoods. ECTAD, through FAO, OER and NSA, needs to seek out additional funding for a wider range of animal health priorities and geographic areas, in collaboration with EMPRE-AH.

**Recommendation 3. FAO needs to fully utilize its convening power, partnerships, trusted status and experience of emerging pandemic threats to engage political and business leaders on the need to consolidate and scale up EPT-2-induced gains to improve pandemic preparedness. To reinforce progress, FAO must continue to support a cohesive EPT-2 package of objectives and broaden its scope to ensure the sustainability of outcomes in those countries ready to invest. This will require an emphasis on advocacy and high-level policy and, in light of COVID-19, strengthening particular components of the programme, such as the identification and surveillance of livestock and wildlife hotspots to reduce the risk of outbreaks and to ensure early detection and response to any that occur.**

239. EPT-2's technical achievements are a basis for achieving significant and sustained impact in future, but lasting outcomes and institutional capabilities have yet to be achieved in

most countries. COVID-19 and the zoonotic disease threats addressed by EPT-2 have demonstrated the need for prevention, early-detection and rapid-response systems. How to make systems functional, prepared and sufficiently invested is a major shortcoming globally, regionally and nationally. International agencies agree that a One Health approach is needed and that they need to better use the knowledge and tools at their disposal to persuade senior policymakers, private companies and civil society to invest in it, in terms of reorganization, capacity development, budgets and strategy.

240. COVID-19 has stalled private-sector growth in all countries. The private sector was a largely untapped resource for EPT-2, but played key advocacy and investment roles. FAO and national governments need to leverage industry bodies, cooperatives and influential companies with the resources and expertise to help strengthen prevention and detection mechanisms. Engaging them will require a communications strategy to build greater awareness of the risks of infectious disease outbreaks to ensure less resistance from companies, as well as policy and regulations to encourage cooperation with national governments. The private sector will need to be fully involved in the development of national plans with a view to leveraging private-sector assets and capabilities. This fresh engagement will require FAO Legal Office support to ensure agreements can be forged rapidly and effectively with the private sector.

**Suggested actions:**

- a. Consultations with public and private partners should agree the framework for future engagement on emerging pandemic threats. This should concurrently include key milestones for assessing progress.
- b. Future programmes should consider including policy advocacy elements to buttress technical investments with appropriate institutional strengthening for sustainability.
- c. New skillsets need to be acquired within ECTAD, orientated towards the efficient use of evidence for advocacy, policy development, clarification of working relations with regular programmes and support from FAO senior management. Links with NSAL, already in place through ASL 2050, provide a solid basis for expanding into this space. ECTAD also needs the skills to make a strong investment case to the private sector.
- d. ECTAD needs to build on links with OER to produce evidence-based case studies using FAO's methodology for damage and loss assessment in agriculture (Conforti et al., 2020).<sup>36</sup> Applied to pandemic threats, this tool corresponds with universal norms, commitments and collective action at global level, while remaining sufficiently flexible to be applied in various country/regional contexts.
- e. Sustained effort is required to encourage national resource utilization and mobilization among heads of state, ministers of finance, and senior policymakers in relevant ministries. This requires engagement from FAO senior management, perhaps as part of the ECTAD review (see Recommendation 5). It will require a stakeholder analysis and the selection of new partners best placed to assist, for example, the Africa Centres for Disease Control and Prevention (Africa CDC), endorsed by the African Union (AU) Assembly of Heads of State and launched in 2017 to improve surveillance, emergency response and the prevention of infectious diseases. Africa CDC has developed a five-year strategic plan that will act as a basis

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<sup>36</sup> The tool serves both national policy and planning needs, as well as the post-2015 international resilience agendas, including the Sendai Framework for Disaster Risk Reduction and SDGs.



for external funders, including the World Bank and the People’s Republic of China, to consider significant direct or parallel financial support. Furthermore, countries could use World Bank/International Development Association (IDA) Regional Program funding for projects that contain activities to strengthen pandemic preparedness. The World Bank has sizeable projects in which FAO could engage more, such as the West Africa Regional Disease Surveillance Systems Enhancement Program (REDISSE) (USD 390.8 million), currently spanning 11 countries and the West Africa Health Organization, forming an interdependent series of projects to increase national, regional and cross-sectoral capacity for integrated disease surveillance and response in West Africa. Other international finance institutions should also be involved, including the International Fund for Agricultural Development (IFAD), AfDB, ADB and the Islamic Development Bank, as they offer potential networking and partnership opportunities.

- f. Internationally recognized assessment tools developed by WHO and OIE, such as JEE and PVS, are starting to be used for gap analysis. FAO should become closely involved in their use and in improving understanding of how they might be used to develop indices that measure intrinsic risk, state of preparedness and economic vulnerability, so as to incentivize governments and the private sector to invest and mitigate risks.
- g. Different types of partnership with government will likely require ECTAD to have different skills. Building on the 2019 USAID policy framework, the next phase of EPT-2 should consider catalytic or pull mechanisms for increasing domestic investment, such as linking assistance (for example, training and the provision of equipment) with recurrent costs in the national budget; augmenting national budget allocations for disease prevention and detection with agreed inputs from FAO or other external sources; or creating synergies for national resource mobilization by leveraging regional partnerships and strategic networks.
- h. Failed and fragile states where domestic resourcing is not a realistic option should not be neglected in the next phase. Development assistance is available in these countries. At the time of writing, the Government of the United Kingdom, for example, had committed to spending 30 percent of official development assistance to support fragile and conflict-affected states. To engage in failed and fragile states, FAO is likely to need a programmatic approach to pandemic threats and emerging infectious diseases, as well as livestock experts working closely with OER, at least regionally, to engage with development partners and local authorities to prepare proposals linked to resilience-building efforts (Strategic Objective 5).

**Recommendation 4. Future EPT-2 work requires a robust gender strategy and a clearly articulated approach to engaging with minority groups.**

- 241. Two-thirds of poor livestock keepers are rural women and trends in the “feminization of agriculture” indicate that they are likely to become significant stakeholders in livestock management. Enabling women to participate in disease surveillance and treatment would be beneficial to disease control, as women are often the primary animal healthcare providers, feed gatherers, birth attendants and users of livestock products in their families and communities. Though not documented systematically, EPT-2 has shown (in Bangladesh, Egypt and the Lao People’s Democratic Republic) how reaching out to women can help increase effectiveness.
- 242. However, treating women as instruments to achieve project objectives will neither empower women nor ensure sustainability of outcomes. For example, for women to function as successful vaccinators or seek timely treatment, an enabling environment and changing prevailing gender-based divisions of work are as important as training inputs. The purpose of capacity-building will have to go beyond making women good recipients

of services and turn them into informed decision makers. Gender integration in livestock health programmes should consider how to improve the position of women and influence strategic gender relations; gender-transformative approaches must address some of the social norms, attitudes and behaviours, power relations and social systems that underline and entrench gender inequalities. This will require intensive efforts and resources. Women's typical roles within a livestock production system vary from region to region. Aside from women, other disadvantaged sections of society, such as religious minorities and tribal communities, remain excluded, despite their contribution to livestock management.

243. Therefore, in the next phase it is necessary to design a programme-level strategy for gender integration, as well as country-level gender action plans to address the interests of women and other disadvantaged sections of society. It is crucial to work with all such societal groups to improve disease surveillance and control. The strategy should also enhance efforts to improve the gender balance across all levels of staff, particularly at field level, and the gender sensitization of all related parties and stakeholder groups.

**Recommendation 5. The evaluation recommends a high-level review of how ECTAD can support broader livestock-related work across the various technical departments and divisions, including NSA, fisheries, food safety, AMR and resilience building in the face of disasters and emergencies. The review should be carried out by the appropriate key strategic offices and consult with decentralized offices and resilience hubs, where considerable experience and viewpoints are to be found on how ECTAD might evolve to support a more effective and efficient programme of livestock work.**

244. This evaluation and previous OED evaluations looking at EMPRES-AH and HPAI have concluded that the collaboration between OER and NSA on the implementation of the ECTAD is highly effective. ECTAD has become a major supporting component of FAO's work on animal health for nearly 15 years, working on zoonoses, One Health, AMR and broader disaster risk management and resilience building. It has the potential to grow in terms of scope of work and coverage, possibly with the strategic investment of regular programme funds to ensure coverage that could, in turn, secure extrabudgetary funds through the broader scope of work.
245. ECTAD is an important FAO resource. It has proved able to rapidly deploy short-term contracted technical experts as consultants to complement regular programme staff in NSA and elsewhere. It need not be limited to transboundary animal diseases and pandemic threat reduction programmes, such as EPT-2 and GHSA. Under regular programme guidance and with extrabudgetary funding, a range of skillsets can be deployed at ECTAD regional and sub-regional offices and resilience hubs to support Country Offices. A broader range of skillsets among ECTAD staff would enable them to deliver the more holistic support that countries and regions expect with regard to the livestock industries, food security and safety, economic development and resilience, and human wellbeing to meet the SDGs.
246. The ECTAD review should consider a change in programme name, as it has outgrown the original acronym.



## References

- Antimicrobial Resistance Campaign in Asia.** 2017. *Unified AMR surveillance in Asia. Laboratory staff training on AMR surveillance* [web page]. In: *Antimicrobial Resistance Campaign in Asia* [online]. Accessed at: <https://amrasia.exposure.co/unified-amr-surveillance-in-asia>
- Berthe, F., Cesar, J., Bouley, T., Karesh, W., Le Gall, F., Machalaba, C. et al.** 2018. *One Health: Operational Framework for Strengthening Human, Animal and Environmental Public Health Systems at their Interface*. The World Bank. Washington D.C. (also available at: <http://documents1.worldbank.org/curated/en/703711517234402168/pdf/123023-REVISED-PUBLIC-World-Bank-One-Health-Framework-2018.pdf>).
- Bond, K.C., Macfarlane, S.B., Burke, C., Ungchusak, K. & Wibulpolprasert, S.** 2013. *The evolution and expansion of regional disease surveillance networks and their role in mitigating the threat of infectious disease outbreaks*. *Emerging Health Threats Journal*, 6(1). (also available at: <https://doi.org/10.3402/ehth.v6i0.19913>).
- Centers for Disease Control and Prevention (CDC).** 2018. *One Health Basics* [online]. Atlanta, GA. [Last accessed 4 January 2021]. <https://www.cdc.gov/onehealth/basics/index.html#:~:text=One%20Health%20is%20a%20collaborative,plants%2C%20and%20their%20shared%20environment>
- Cheng, V.C.C., Lau, S.K.P., Woo, P.C.Y. & Yuen, K.Y.** 2007. Severe Acute Respiratory Syndrome Coronavirus as an Agent of Emerging and Reemerging Infection. *Clinical Microbiology Reviews*, 20(4): 660–694. (also available at: <https://cmr.asm.org/content/cmr/20/4/660.full.pdf>).
- Conforti, P., Markova, G. & Tochkov, D.** 2020. *FAO's methodology for damage and loss assessment in agriculture*. FAO Statistics Working Paper ESS/19–17. Rome. (also available at: <http://www.fao.org/3/ca6990en/CA6990EN.pdf>).
- FAO & OIE.** 2018. *Joint FAO–OIE Evaluation of the Global Framework for Transboundary Animal Diseases*. Rome: FAO. (also available at: <http://www.fao.org/3/CA1957EN/ca1957en.pdf>).
- FAO, OIE, WHO & UNEP.** 2019. *Antimicrobial Resistance Video – Asia and the Pacific Region* [online], 20 November 2019. Bangkok. <https://www.youtube.com/watch?v=2Dz92bEcWho> <https://amrasia.exposure.co/unified-amr-surveillance-in-asia>
- FAO, WHO & OIE.** 2019. *Taking a Multisectoral, One Health Approach: A Tripartite Guide to Addressing Zoonotic Diseases in Countries*. Rome: FAO. (also available at: <http://www.fao.org/ag/againfo/resources/en/publications/TZG/TZG.htm>).
- FAO.** 2007. *The First Real-Time Evaluation of FAO's Work on Highly Pathogenic Avian Influenza*. Rome. (also available at: [http://www.ipcinfo.org/fileadmin/user\\_upload/oed/docs/HPAI%201st%20ORTE%20final%20rpt%2014sep07.pdf](http://www.ipcinfo.org/fileadmin/user_upload/oed/docs/HPAI%201st%20ORTE%20final%20rpt%2014sep07.pdf)).
- FAO.** 2008. *Global programme for the prevention and control of H5N1 highly pathogenic avian influenza*. Rome. (also available at: <http://www.fao.org/tempref/docrep/fao/010/ai380e/ai380e00.pdf>).
- FAO.** 2009. *Second Real Time Evaluation of FAO's Work on the Highly Pathogenic Avian Influenza*. Rome. (also available at: <http://www.fao.org/3/a-bd672e.pdf>).
- FAO.** 2010. *Corporate Strategy on Capacity Development*. Rome. (also available at: [http://www.fao.org/fileadmin/user\\_upload/newsroom/docs/Summary Strategy PR E.pdf](http://www.fao.org/fileadmin/user_upload/newsroom/docs/Summary Strategy PR E.pdf)).

- FAO.** 2011. *One Health Action Plan*. Rome. (also available at: <http://www.fao.org/3/al868e/al868e00.pdf>).
- FAO.** 2012. *Global Trends and Future Challenges for the Work of the Organization*. Web annex to the FAO Council, 144th Session, Rome, 11–15 June 2012. (also available at: <http://www.fao.org/bodies/council/cl144/en/>).
- FAO.** 2013a. *World Livestock 2013: Changing disease landscapes*. Rome. (also available at: <http://www.fao.org/policy-support/tools-and-publications/resources-details/en/c/1262789/#:~:text=The%20World%20Livestock%202013%3A%20Changing,the%20disease%20dynamics%20that%20result>).
- FAO.** 2013b. *FAO Policy on Gender Equality: Attaining Food Security Goals in Agriculture and Rural Development*. Rome. (also available at: <http://www.fao.org/3/a-i3205e.pdf>).
- FAO.** 2016a. *Evaluation of FAO Strategic Objective 5: Increase the resilience of livelihoods to threats and crises*. Rome. (also available at: <http://www.fao.org/3/a-bq613e.pdf>).
- FAO.** 2016b. *Evaluation of FAO's Emergency Prevention System (EMPRES) Programme in Food Chain Crises*. Rome. (also available at: <http://www.fao.org/3/l8924EN/i8924en.pdf>).
- FAO.** 2016c. *Rational use of vaccination for prevention and control of H5 highly pathogenic avian influenza*. Focus On Volume 10. Rome. (also available at: <http://www.fao.org/3/a-i5625e.pdf>).
- FAO.** 2016d. *Addressing H5N1 Highly Pathogenic Avian Influenza: Qualitative risk assessment on spread in the Central African region*. Rome. (also available at <http://www.fao.org/3/a-i6348e.pdf>).
- FAO.** 2016e. *The FAO Action Plan on Antimicrobial Resistance 2016–2020: Supporting the food and agriculture sectors in implementing the Global Action Plan on Antimicrobial Resistance to minimize the impact of antimicrobial resistance*. Rome. (also available at: <http://www.fao.org/3/a-i5996e.pdf>).
- FAO.** 2017a. *Dromedary Camels and MERS-CoV: Filling Knowledge Gaps*. Information sheet. Rome. (also available at: <http://www.fao.org/3/a-i7350e.pdf>).
- FAO. 2017b. *H5N8 Documents* [web page]. In: FAO [online]. Accessed at: <http://www.fao.org/ag/againfo/programmes/en/empres/H5N8/documents.html>
- FAO.** 2018a. *2016–2018 Spread of H5N8 highly pathogenic avian influenza (HPAI) in sub-Saharan Africa: epidemiological and ecological observations*. Focus On Volume 12. Rome. (also available at: <http://www.fao.org/3/CA1209EN/ca1209en.pdf>).
- FAO.** 2018b. *Evaluation of the Emergency Prevention System (EMPRES) Programme in Food Chain Crises*. Rome. (also available at: <http://www.fao.org/3/l8924EN/i8924en.pdf>).
- FAO.** 2018c. *Ebola virus and animals: Our knowledge to date and how animal health can support the public health emergency*. Rome. (also available at: <http://www.fao.org/3/CA0129EN/ca0129en.pdf>).
- FAO.** 2018d. *Antimicrobial resistance policy review and development framework: A regional guide for governments in Asia and the Pacific to review, update and develop policy to address antimicrobial resistance and antimicrobial use in animal production*. Bangkok. (also available at: <http://www.fao.org/3/CA1486EN/ca1486en.pdf>).
- FAO.** 2019a. *Chinese-origin H7N9 avian influenza spread in poultry and human exposure: Qualitative risk assessment update*. Animal Health Risk Analysis, Assessment No. 8. Rome. (also available at: <http://www.fao.org/3/CA3206EN/ca3206en.pdf>).

- FAO.** 2019b. *Real-time monitoring and forecasting of Rift Valley Fever in Africa*. Information sheet. Rome. (also available at: <http://www.fao.org/3/ca5511en/ca5511en.pdf>).
- FAO.** 2019c. *World Antibiotic Awareness Week (WAAW) 2019* [online]. Bangkok. [Last accessed 4 January 2021]. <http://www.fao.org/asiapacific/events/detail-events/en/c/1638/>
- FAO.** 2019d. *Regional AMR Monitoring and Surveillance Guidelines, Volume 1: Monitoring and surveillance of antimicrobial resistance in bacteria from healthy food animals intended for consumption*. Bangkok. (also available at: <http://www.fao.org/3/ca6897en/CA6897EN.pdf>).
- Faye, B.** 2014. The Camel today: Assets and Potentials. *Anthropozoologica*, 49(2): 167–176.
- International Monetary Fund (IMF).** 2020. *World Economic Outlook, October 2020: A Long and Difficult Ascent*. Washington, DC. (also available at: <https://www.imf.org/en/Publications/WEO/Issues/2020/09/30/world-economic-outlook-october-2020>).
- Jonas, O. & Warford, L.** 2014. *Global Program for Avian Influenza Control and Human Pandemic Preparedness and Response: Project Accomplishments*. Washington, DC: World Bank. (also available at: <https://openknowledge.worldbank.org/handle/10986/21541>).
- Jones, K.E., Patel, N.G., Levy, M.A., Storeygard, A., Balk, D., Gittleman, J.L. & Daszak, P.** 2008. Global trends in emerging infectious diseases. *Nature*, 451(7181): 990–993. (also available at: <https://www.nature.com/articles/nature06536.pdf>).
- Lee, J.W. & McKibbin, W.J.** 2004. Estimating the global economic costs of SARS. In S. Knobler, A. Mahmoud, S. Lemon et al. (eds.) *Learning from SARS: Preparing for the Next Disease Outbreak: Workshop Summary*. Washington, DC: National Academies Press (US). (also available at: <https://www.ncbi.nlm.nih.gov/books/NBK92473>).
- Mackenzie, J.S. & Jeggo, M.** (2019). The One Health Approach – Why Is It So Important? *Tropical Medicine and Infectious Disease*, 4(2): 88. (also available at: <https://doi.org/10.3390/tropicalmed4020088>).
- Menachery, V.D., Yount, B.L. Jr., Sims, A.C., Debbink, K., Agnihothram, S.S., Gralinski, L.E. et al.** 2016. SARS-like WIV1-CoV poised for human emergence. *Proceedings of the National Academy of Sciences of the United States of America*, 113(11): 3048–3053. (also available at: <https://www.pnas.org/content/113/11/3048#ref-list-1>).
- One Health Commission.** n.d. *What is One Health?* [online]. Apex, NC. [Last accessed 4 January 2021]. [https://www.onehealthcommission.org/en/why\\_one\\_health/what\\_is\\_one\\_health/](https://www.onehealthcommission.org/en/why_one_health/what_is_one_health/)
- Pike, B., Saylor, L., Fair, K., LeBreton, M., Tamoufe, U., Djoko, C., Rimoin, A. & Wolfe, N.** 2010. The Origin and Prevention of Pandemics. *Clinical Infectious Diseases*, 50(12): 1636–1640. (also available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2874076/>).
- Pittiglio, C., Shadomy, S., Elidrissi, A., Lubroth, J., Soumare, B. & Makonnen, Y.** Forthcoming. Seasonality and ecological suitability modelling for anthrax in western Africa. *PloS Neglected Tropical Diseases* (submitted).
- Smith, K.F., Goldberg, M., Rosenthal, S., Carlson, L., Chen, J., Chen, C. & Ramachandran, S.** 2014. Global Rise in Human Infectious Disease Outbreaks. *Journal of the Royal Society, Interface*, 11(101): 20140950. (also available at: <https://pubmed.ncbi.nlm.nih.gov/25401184/>).
- Taylor, L.H., Latham, S.M. & Woolhouse, M.E.** 2001. Risk factors for human disease emergence. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, 356(1411): 983–989. (also available at: <https://pubmed.ncbi.nlm.nih.gov/11516376/>).

**United States Agency for International Development (USAID).** 2012. *Gender Equality and Female Empowerment Policy*. Washington, DC. (also available at: [https://www.usaid.gov/sites/default/files/documents/1870/GenderEqualityPolicy\\_0.pdf](https://www.usaid.gov/sites/default/files/documents/1870/GenderEqualityPolicy_0.pdf)).

**USAID.** 2018. *Emerging Pandemic Threats 2 Program Evaluation: Reduce risk and impact of emerging pandemic threats using a One Health approach*. Washington, DC. (also available at: [https://pdf.usaid.gov/pdf\\_docs/PA00SW1M.pdf](https://pdf.usaid.gov/pdf_docs/PA00SW1M.pdf)).

**USAID.** 2020. *The Journey to Self-Reliance* [online]. Washington, DC. [Last accessed 4 January 2021]. <https://www.usaid.gov/selfreliance/>

**Von Dobschuetz, S., Roche, X.C.R., Pittiglio, C., Plee, L., Shadomy, S., Palamara, E. et al.** 2018. Ebola in animals – our knowledge to date: assessing human exposure risks. *International Journal of Infectious Diseases*, 79(Suppl. 1): 1–2. (also available at: <https://doi.org/10.1016/j.ijid.2018.11.024>).

**WHO.** 2003. *Consensus document on the epidemiology of severe acute respiratory syndrome (SARS)*. Geneva, Switzerland. (also available at: <https://www.who.int/csr/sars/en/WHOconsensus.pdf>).

**WHO.** 2016. Communiqué : Réunion ministérielle ‘Une seule santé’ pour lutter contre les zoonoses et les autres menaces pour la santé publique y relatives [online]. Press release, 11 November 2016. Dakar. <https://reliefweb.int/report/world/communiqu-r-union-minist-rielle-une-seule-sant-pour-lutter-contre-les-zoonoses-et-les>

**World Bank.** 2017. *From Panic and Neglect to Investing in Health Security: Financing Pandemic Preparedness at a National Level*. Washington, DC. (also available at: <https://www.worldbank.org/en/topic/pandemics/publication/from-panic-neglect-to-investing-in-health-security-financing-pandemic-preparedness-at-a-national-level>).

**World Bank.** 2019a. *Pandemic Preparedness Financing: Status Update*. Washington, DC. (also available at: [https://apps.who.int/gpmb/assets/thematic\\_papers/tr-4.pdf](https://apps.who.int/gpmb/assets/thematic_papers/tr-4.pdf)).

**World Bank.** 2019b. *The Africa Centers for Disease Control and Prevention Receives Support to Strengthen Continental and Regional Infectious-Disease Detection and Response Systems* [online]. Press release, 10 December 2019. Washington, DC. <https://www.worldbank.org/en/news/press-release/2019/12/10/the-africa-centers-for-disease-control-and-prevention-receives-support-to-strengthen-continental-and-regional-infectious-disease-detection-and-response-systems>

**World Health Organization (WHO).** n.d. *WHO R&D Blueprint* [online]. Geneva, Switzerland. [Last accessed 8 December 2020]. [https://www.who.int/research-observatory/analyses/rd\\_blueprint/en/](https://www.who.int/research-observatory/analyses/rd_blueprint/en/)

## Appendix 1. People interviewed

Country	First Name	Last Name	Role	Institution/Agency
<b>FAO HQ +</b>				
FAO HQ	Shukri	Ahmed	Deputy Director, OER	FAO
USA	Patricia R.	Bright	Senior One Health Technical Advisor, Office of Infectious Disease, Emerging Threats Division	USAID Bureau for Global Health
FAO HQ	Dominique	Burgeon	PSE Director	FAO
USA	Andrew	Clements	Senior Scientific Advisor, Emerging Threats Division/Office of Infectious Diseases	USAID Bureau for Global Health
FAO HQ	Irina	Curca	Programme Officer	FAO
FAO HQ	Cristian	DeBattisti	Global Laboratory Coordinator	FAO
FAO HQ	Bouna	Diop	Former PRR Secretariat	FAO
FAO HQ	Ahmed	Elidrissi	Assistant to the Chief, AGAH	FAO
Myanmar	David	Hadrill	ECTAD Country Team Leader, Myanmar	FAO
FAO HQ	Mirela	Hasibra	Emergency and Rehabilitation Officer	FAO
FAO HQ	Wantanee	Kalpravidh	ECTAD Regional Team Leader	FAO
FAO HQ	Akiko	Kamata	Animal Health Officer	FAO
Burkina Faso	Estelle	Kanyala	Expert Epidemiologist and M&E	FAO
FAO HQ	Fairouz	Larfaoui	Animal Health Officer	FAO
FAO HQ	Caryl	Lockhart	Senior Veterinary Epidemiologist; Global ISAVET Coordinator	FAO
FAO HQ	Juan	Lubroth	Chief and Head of ECTAD	FAO
Ethiopia	Yilma	Makonnen	Senior Animal Health Officer	FAO/Africa CDC
FAO HQ	Rosanne	Marchesich	Senior Emergency and Rehabilitation Officer	FAO
China	Vincent	Martin	FAO Representative, China	FAO China
Ethiopia	Ricarda	Mondry	Livestock Development Officer	FAO Sub-Regional Office for East Africa (SFE)
Philippines	Reildrin	Morales	Animal Health Officer	FAO
FAO HQ	Subhash	Morzaria	Ex-EPT2 Global Manager	FAO
FAO HQ	Beatrice	Mouille	Deputy Laboratory Unit Coordinator	FAO
Uganda	Sam	Okuthe	ECTAD Country Team Leader	FAO Uganda
USA	Lindsay	Parish	Infectious Disease and Vaccine Advisor - Emerging Threats Division, Office of Infectious Disease	USAID Bureau for Global Health
FAO HQ	Ugo	Pica Ciamarra	Livestock Economist	FAO
FAO HQ	Julio	Pinto	Animal Health Officer	FAO
FAO HQ	Claudia	Pittiglio	Disease Ecology and Risk Modelling expert	FAO
FAO HQ	Ludovic	Plee	Animal Health Officer	FAO
Hungary	Eran	Raizman	Animal Production Officer	FAO Regional Office for Europe and Central Asia (REUT)
FAO HQ	Asma	Saidouni Oulebsir	Veterinary Epidemiologist	FAO
FAO HQ	Keith	Sumption	Chief Veterinary Officer	FAO
FAO HQ	Berhe	Tekola	AGA Director	FAO
FAO HQ	Bianca	Tonetti	Emergency and Rehabilitation Officer	FAO



Country	First Name	Last Name	Role	Institution/Agency
Burkina Faso	Adele	Traorekam	National Coordinator ECTAD	FAO
Philippines	Rafael	Umbreiro	National Monitoring and Evaluation Specialist	FAO
Ethiopia	Gijs	Vant Klooster	ECTAD Country Team Leader, Ethiopia	FAO
FAO HQ	Sophie	VonDobschuetz	Animal Health Officer	FAO
<b>Bangladesh</b>				
Bangladesh	Rabiul	Alam	Assitant Professor	Chittagong Medical College
Bangladesh	Md. Jahangir	Alam	Dean	Sher-E-Bangla Agricultural University
Bangladesh	Md. Golam Shahi	Alam	Member	Bangladesh Accreditation Council
Bangladesh	Tanzila	Alam Sarah	Medical Officer	Chittagong Medical College
Bangladesh	Nurjahan	Begum	Upazila Livestock Officer	Upazila Livestock Office
Bangladesh	Hiresb Ranjan	Bhowmik	Director General	Department of Livestock Services
Bangladesh	Paritosh Kumar	Biswas	Director, Poultry Research and Training Centre	Chittagong Veterinary and Animal Sciences University
Bangladesh	Eric	Brum	Team Leader - ECTAD Country Programme	FAO Bangladesh
Bangladesh	Nadia	Choudhury	National Technical Advisor - Law and Jurisprudence	FAO Bangladesh
Bangladesh	Sally	Crafter	Consultant	FAO Bangladesh
Bangladesh	Stacie	Dunkle	Technical Advisor - Epidemiology	FAO Bangladesh
Bangladesh	Shahnila	Ferdousi	Director, Disease Control and Line Director, Communicable Disease Control	Directorate General of Health Services (DGHS)
Bangladesh	Mohammad	Giasuddin	Director, National Reference Laboratory for Avian Influenza and Head, Animal Health Research Division	Bangladesh Livestock Research Institute
Bangladesh	Mohammad	Habibur	National Technical Advisor - One Health	FAO Bangladesh
Bangladesh	K.M. Mozaffor	Hossain	Professor	University of Rajshahi
Bangladesh	Md. Reajul	Hug	District Livestock Officer	District Livestock Office
Bangladesh	Md. Ariful	Islam	Professor	Bangladesh Agricultural University (BAU)
Bangladesh	Mohammad	Islam	Senior Technical Advisor - One Health education	FAO Bangladesh
Bangladesh	Md. Abul	Kalam	Global Health Security Specialist	USAID
Bangladesh	Mst. Minara	Khatun	Professor	Bangladesh Agricultural University (BAU)
Bangladesh	Alia El	Mohandes	Senior Family Planning Advisor	USAID
Bangladesh	Hamida	Monira	National Technical Advisor - Clinical Services	FAO Bangladesh
Bangladesh	Kamrun	Naher	Senior Technical Advisor - in service training	FAO Bangladesh
Bangladesh	Consolata	Ngemu	Operations Project Manager	FAO Bangladesh
Bangladesh	Mohamed	Nure Alam	Upazila Livestock Officer	Upazila Livestock Office
Bangladesh	Redoyan	Pasha	District Livestock Officer	District Livestock Office

## References

Country	First Name	Last Name	Role	Institution/Agency
Bangladesh	Moshiur	Rahman	Convener	BPICC
Bangladesh	Md. Mahbubur	Rahman	Director General	Directorate General of Drug Administration (DGDA)
Bangladesh	Mohamed Harun	Rashid	Upazila Livestock Officer	Upazila Livestock Office
Bangladesh	Jay Prakash	Ray	Product Executive	Square Pharmaceuticals
Bangladesh	Nadia Ali	Rimi	Associate Scientist	icddr,b
Bangladesh	S.M. Shahriar	Rizvi	Microbiologist	Directorate General of Health Services (DGHS)
Bangladesh	Mohammad	Sadekuzzamam	Upazila Livestock Officer	Department of Livestock Services, Central Disease Investigation Laboratory
Bangladesh	Robert	Simpson	FAO Representative, Bangladesh	FAO Bangladesh
Bangladesh	Bishaka	Tanchangya	M&E Reporting Manager	FAO Bangladesh
Bangladesh	Motahara	Tasneem	National Technical Advisor - Veterinary Training	FAO Bangladesh
Bangladesh	Dedic	Tatjana	International Procurement Officer	FAO Bangladesh
Bangladesh	Daniel	Wachira	International Operations Officer	FAO Bangladesh
<b>Egypt</b>				
Egypt	Rehab	Abdelekader	Head, Epi-Unit	Ministry of Agriculture
Egypt	Sohir	Abdelkader	National Consultant – Field Project Coordinator	FAO Egypt
Egypt	Amira	AbdelNabi	National Animal Health Expert	FAO Egypt
Egypt	Mohamed	Ahmed Ali	Director	National Research Centre, Center of Scientific Excellence for Influenza Viruses
Egypt	Abdelhakim	Ali	Chief Veterinary Officer	Ministry of Agriculture
Egypt	Mohamed	Attia	Head Preventive Medicine	Ministry of Agriculture
Egypt	Nabil	Darwish	Chairman	Egyptian Poultry Association (EPA)
Egypt	Tharwat	El Zeiny	Vice Chairman	Egyptian Poultry Association (EPA)
Egypt	Nasredin Hag	Elamin	FAO Representative, Egypt	FAO Egypt
Egypt	Akmal M. K.	Elerian	Senior Program Manager, Office of Education and Health	USAID, Egypt
Egypt	Mervat	Emara	Head, Large Animal disease	Ministry of Agriculture
Egypt	Toni	Ettal	Program Operations Officer	FAO Egypt
Egypt	Ahmed	Fathy	Mitigation Focal Point	Head of district veterinary services
Egypt	Bart	Haagmans	Researcher	Erasmus Medical Center in the Netherlands
Egypt	Ayman	Hamada	Director General of Species Diversity, Biodiversity Department	Ministry of Environment
Egypt	Mohamed	Hassan Khalifa	Ex Director	Ministry of Agriculture – NLQP

Country	First Name	Last Name	Role	Institution/Agency
Egypt	Samah	Hefny	MERS Focal Point	Ministry of Agriculture - Animal Health Research Institute
Egypt	Essam	Ibrahim	Deputy Director	Ministry of Agriculture - Animal Health Research Institute
Egypt	Shereen Galal Mohammed	Kholousy	Head of Laboratory Information Management Unit	Ministry of Agriculture
Egypt	Amal	Mansour	Animal Health Expert	FAO Egypt
Egypt	Wafaa	Mohamed	Director	Ministry of Agriculture – NLQP
Egypt	Mohamed	Moussa	Communications Expert & M&E	FAO Egypt
Egypt	Samir Abdel Moez	Nassif	Deputy Director	Central Laboratory for Evaluation of Veterinary Biologics
Egypt	Nisreen	Okba	Researcher	Erasmus Medical Center in the Netherlands
Egypt	Abdessalam	Ould Ahmed	FAO Assistant Director-General and Regional Representative for the Near East and North Africa	FAO Egypt
Egypt	Ahmed	Saad	Deputy Team Leader	FAO Egypt
Egypt	Gehad	Salah	Head, Poultry disease	Ministry of Agriculture
Egypt	Abdullah	Seliem	Technical Manager	Ministry of Agriculture – NLQP
Egypt	Momtaz	Shahein	Director	Ministry of Agriculture - Animal Health Research Institute
Egypt	Zelalem	Tadesse	ECTAD team leader, Egypt	FAO Egypt
Egypt	Mohamed Mamdouh	Yacoub	Assitant FAO Representative (Programmes)	FAO Egypt
Egypt	Farid Fouad	Zaki	Director	Central Laboratory for Evaluation of Veterinary Biologics
<b>Ghana</b>				
Ghana	Patrick	Ababio	Veterinarian	Accra Veterinary Lab
Ghana	Joseph	Abu	Veterinary officer	Veterinary Services Directorate
Ghana	Adusei	Acheampong	Veterinarian	Kumasi
Ghana	Helen	Acquah	Epidemiology Unit	Veterinary Services Directorate, Epidemiology Unit
Ghana	Benjamin M.	Adjei	Assitant FAO Representative (Programmes)	FAO Ghana
Ghana	Victor Oppong	Adjei	National Chairman	Ghana National Association of Poultry Farmers
Ghana	Dominic	Akamase	Secretary	Live Bird Sellers Assoc of Ghana
Ghana	Jacob	Akilemora	Assistance Secretary	Live Bird Sellers Assoc of Ghana
Ghana	Anthony	Akunzule	National Programme Coordinator, ECTAD	FAO Ghana
Ghana	William	Amanfu	Consultant Veterinary Epidemiologist	FAO Ghana

## References

Country	First Name	Last Name	Role	Institution/Agency
Ghana	Patrick	Amponsah	Veterinarian	Kumasi Laboratory
Ghana	Ruth	Arthur	Health Educator	National Disaster Management Organization
Ghana	Franklin	Asiedu-Bekoe	Head of Disease Surveillance Department and Deputy Director of Public Health	Ghana Health Service (GHS)
Ghana	Joseph	Awuni	Deputy Director	Accra Veterinary Lab
Ghana	Asiedu	Baah	Chief Veterinary Officer	Veterinary Services Directorate
Ghana	Mensah	Bonsu	Poultry Farmer	Asante Region
Ghana	Jocelyne	Brown Hall	Deputy Regional Representative	FAO Regional Office for Africa (RAF)
Ghana	Effah	Emmanuel	Regional Veterinary Officer	Kumasi
Ghana	Emmanuel	Eshun	Epidemiology Unit	Veterinary Services Directorate, Epidemiology Unit
Ghana	Gloria	Frempeh	Poultry Farmer	Asante Region
Ghana	Ahmed	Garba	Country Team Leader, ECTAD	FAO Ghana
Ghana	Adu	Kumah	Deputy Director	Veterinary Services Directorate
Ghana	Mensah	Marlon-Zonal	Epidemiologist	Kumasi
Ghana	Ziekah	Meyir	Wildlife Veterinarian	Kumasi Zoo
Ghana	Scott	Newman	Senior Animal Health and Production Officer	FAO Regional Office for Africa (RAF)
Ghana	Emmanuel	Odotei	Activity Manager	USAID
Ghana	Dr Sally-Ann	Ohene	National Programme Officer for Disease Prevention and Control (NPO-DPC)	WHO, Ghana
Ghana	Emmanuel	Pecku	Veterinary Surgeon	Accra Veterinary Lab
Ghana	Paul	Poulku	Epidemiology Unit	Veterinary Services Directorate, Epidemiology Unit
Ghana	Constance	Roberts	Programme Officer	Environmental Protection Agency (EPA)
Ghana	Baba	Soumare	Regional Manager, ECTAD	FAO Regional Office for Africa (RAF)
Ghana	Richard	Suu-Ire	Chairman	Rabies in West Africa (RIWA)
Ghana	Felicity	Toninga	Deputy Director	Veterinary Services Directorate
Ghana	Eugene Murat	Yelfanibe	Deputy Chief Veterinary Officer (Project Coordinator of AI)	Veterinary Services Directorate
<b>Kenya</b>				
Kenya	Najib	Abdi	Member	Council of Governors
Kenya	Khalif	Abey	National Coordinator	Kenya Camel Association
Kenya	Patrick	Bastiaensen	Programme Officer	OI Sub-Regional Office for Eastern Africa
Kenya	Charles	Bebay	Regional Manager, ECTAD	FAO Kenya
Kenya	Hiver	Boussini	Animal Health Officer	AU-IBAR
Kenya	Wanga	Christopher	Member ASL Steering Committee	Directorate of Policy and Research, Ministry of Agric

Country	First Name	Last Name	Role	Institution/Agency
Kenya	Muthuma	Evans	Member ASL Steering Committee	Directorate of Veterinary Services
Kenya	Eric	Fèvre	Professor	ILRI
Kenya	Mutiiria	George	Member ASL Steering Committee	Zoonotic Diseases Unit, MOH
Kenya	Stephen	Gikonyo	ECTAD Regional and National team (Kenya)	FAO Kenya
Kenya	William	Hamisi	Assistant FAOR Programme	FAO Kenya
Kenya	Asoka	Itur	Chairperson	ASL2050 National Steering Committee
Kenya	Joseph	Kamau	Country Coordinator	PREDICT2
Kenya	Stella	Kiambi	AMR National Coordinator and Deputy ECTAD Team Leader	FAO Kenya
Kenya	Tabitha	Kimani	ECTAD Regional Veterinary Socio-economist and AMR Coordinator	FAO Kenya
Kenya	Joshua	Kimutai	ECTAD Regional Laboratory Specialist (East Africa)	FAO Kenya
Kenya	Lisa	Kramer	Regional Emerging Pandemic Threats Advisor	USAID
Kenya	Joseph	Mathooko	National Livestock Expert	FAO
Kenya	Peninah	Munyua	Public Health Specialist	Centre for Disease Control and Prevention - Kenya
Kenya	Mathew	Mutur	Veterinary Epidemiologist	Ministry of Agriculture, Livestock and Fisheries
Kenya	Athman	Mwatondo	Medical Epidemiologist	Ministry of Health
Kenya	Isaac	Ngere	Medical Epidemiologist	Washington State University
Kenya	James	Ngoci	Virologist	Directorate of Veterinary Services
Kenya	Kariuki	Njenga	Researcher	Washington State University
Kenya	Harry	Oyas	Veterinary Epidemiologist	Directorate of Veterinary Services
Kenya	Ameha	Sebsiba	Head of Livestock & Fisheries	IGAD Centre for Pastoral and Livestock Development
Kenya	Gulleid	Shuriye	Program Manager	Kenya Livestock Marketing Council
Kenya	Tobias	Takavarasha	FAOR Kenya	FAO Kenya
Kenya	Evans	Tenge	National Monitoring and Evaluation Officer	FAO
Kenya	Abuom	Tequiero	Professor	OHCEA; University of Nairobi
Kenya	Andrew	Thaiyah	Global Health Security Advisor	USAID
Kenya	Samuel	Wakhusama	OIE Sub-Regional Representative for Eastern Africa	OIE
Kenya	Rinah	Wangila	National Epidemiologist	FAO Kenya
<b>Lao People's Democratic Republic</b>				
Lao People's Democratic Republic	Phongsavay	Chanthaseng	Deputy Director, Zoonosis Division	Department of Communicable Diseases Control
Lao People's Democratic Republic	Chintana	Chanthavisouk	ECTAD	FAO Lao People's Democratic Republic

## References

Country	First Name	Last Name	Role	Institution/Agency
Lao People's Democratic Republic	Nasar	Hayat	FAO Representative, Lao PDR	FAO Lao People's Democratic Republic
Lao People's Democratic Republic	Syseng	Khounsy	Deputy Director General	Department of Livestock and Forestry
Lao People's Democratic Republic	Rattanaxay	Phetsouvanh	Deputy Director General	Department of Communicable Diseases Control
Lao People's Democratic Republic	Vannaphone	Putthana	Deputy Head, Department of Veterinary Medicine	National University of Lao
Lao People's Democratic Republic	Reiko	Tsuyuoka	Health Emergencies Lead	WHO
Lao People's Democratic Republic	Amphai	Vanh	Technical advisor	Poultry health center of Louangprabang province
Lao People's Democratic Republic	Phu	Vong	National Project Coordinator	FAO Lao People's Democratic Republic
<b>Nigeria</b>				
Nigeria	Sylvester Adefemi	Akande	Senior Health Finance Advisor	USAID Nigeria
Nigeria	Joseph	Ako	Member, ASM Steering Committee	Federal Ministry of Agric
Nigeria	Onallo S.	Akpa	Director General	Poultry Association of Nigeria
Nigeria	Carlos	Brito	Director of Public Health	ECOWAS
Nigeria	John	Caleb	Vice Chair -Plateau	Poultry Association of Nigeria
Nigeria	Okpa	Chinka	Member, ASM Steering Committee	Federal Ministry of Environment
Nigeria	Samake	David	Chief Executive Officer	Nigeria National Vet research Institute, VOM
Nigeria	Carlos Pedro	Faria De Brito	Director of Public Health	WAHO/ECOWAS
Nigeria	Hadiza	Gamawa Zubairu	Economic Intelligence Office	Jos
Nigeria	Ayuba M	Haruna	Desk Officer	Ministry of Agric, Plateau
Nigeria	Ezekiel	Ibrahim Mam	National President	Poultry Association of Nigeria
Nigeria	Vivian N	Iwar	Ag. Executive Director, Regional Animal Health Centre	ECOWAS
Nigeria	Tony	Johannes	Researcher and Director HPAI Lab	Nigeria National Vet research Institute, VOM
Nigeria	Mairo	Kachalla	Secretary, ASL Steering Committee	Federal Ministry of Agriculture
Nigeria	Suffyan	Koroma	FAO Representative	FAO Nigeria
Nigeria	Virgil	Lokossou	Expert in Health emergency and disaster management	ECOWAS/Regional CDC
Nigeria	Lami	Lombin	Consultant	University of Jos, Veterinary training hospital
Nigeria	Ibrahim	Mamadu	Emergency Preparedness and IHR Officer	WHO focal Point on One Health

Country	First Name	Last Name	Role	Institution/Agency
Nigeria	Abdulkadir	Mu'azu	Permanent Secretary	Federal Ministry of Agriculture and Rural Development
Nigeria	Anthony	Nanau	Secretary General	Live Bird Market Association, Plateau
Nigeria	Emmanuel	Odunze	FAO Focal point - Dept of Veterinary and Pest Control Services (also national facilitator for ASL2050)	Federal Ministry of Agriculture & Rural Development
Nigeria	Nanlop	Ogbureke	Senior Special Adviser, Directorate General	WAHO/ECOWAS
Nigeria	Stanley	Okolo	Director	West African Health Organization (WAHO) - ECOWAS
Nigeria	Alabi	Olaniran	Director - Chief Veterinary Officer of Nigeria	Federal Ministry of Agriculture and Rural Development
Nigeria	Sipak D.	Shase-et	Director - Chief Veterinary Officer Plateau State	Federal Ministry of Agriculture & Rural Development
Nigeria	Abubakar	Suleiman	Assistant FAOR Programme (Livestock Officer)	FAO Nigeria
Nigeria	Columba Teru	Vakuru	Veterinary Epidemiologist - Deputy Director	Federal Ministry of Agriculture & Rural Development
<b>Thailand</b>				
Thailand	Nadia	Al Jasem	Regional Monitoring and Evaluation Specialist	FAO Regional Office for Asia and the Pacific
Thailand	Katinka de	Balogh	Senior Animal Health and Production Officer	FAO Regional Office for Asia and the Pacific
Thailand	Aurelie	Briuodes	Regional Surveillance Coordinator	FAO Regional Office for Asia and the Pacific
Thailand	Filip	Claes	Regional Coordinator	FAO Regional Office for Asia and the Pacific
Thailand	Ian	Dacre	Regional Emergency Management Specialist	FAO Regional Office for Asia and the Pacific
Thailand	Sudarat	Damrongwatanapokin	Regional Animal Health Advisor	RDMA Thailand
Thailand	Tosapol	Dejyong	International Animal Health and Livestock Value Chain Specialist	FAO Regional Office for Asia and the Pacific
Thailand	Mary Joy	Gordoncillo	Regional Project Coordinator	FAO Regional Office for Asia and the Pacific
Thailand	Jong-Jin	Kim	Deputy Regional Representative	FAO Regional Office for Asia and the Pacific
Thailand	Frank	Pumipuntu	Regional M&E and Reporting Officer	FAO Regional Office for Asia and the Pacific
Thailand	Daniel	Schar	Senior Regional Emerging Infectious Diseases Advisor	RDMA Thailand
Thailand	Balazs	Simon	Regional Programming and Operations Coordinator	FAO Regional Office for Asia and the Pacific
Thailand	Kachen	Wongsathapornchai	Office in Charge (Regional Manager) for ECTAD	FAO Regional Office for Asia and the Pacific

## References

Country	First Name	Last Name	Role	Institution/Agency
<b>Viet Nam</b>				
Viet Nam	Nguyen Thi Phuong	Bac	National Operations Coordinator	FAO Viet Nam
Viet Nam	Nguyen	Doan	Focal point for FAO	CITES, Vietnam
Viet Nam	Nguyen Thi Kim	Dung	Monitoring and Reporting Specialist	FAO Viet Nam
Viet Nam	Amanda	Fine	Wildlife Health Program Associate Director - Asia	PREDICT Consortium (WCS)
Viet Nam	Vo Ngan	Giang	Fleming Fund Coordinator	FHI360
Viet Nam	Nguyen Thuy	Hang	Advocacy and Communication officer/ gender focal point	FAO Viet Nam
Viet Nam	Ha Thuy	Hanh	DDG	NAEC
Viet Nam	Nguyen	Hung	Regional representative for South East Asia	ILRI, South East Asia
Viet Nam	Lai Thi Lan	Huong	AVET coordinator	FAO Viet Nam
Viet Nam	Nguyen Thi Thanh	Huong	Focal Point - Team Leader of Secretariat Rabies control and Elimination program on Human	NIHE
Viet Nam	Le Thi Thanh	Huyen	National Administrative Assistant	FAO Viet Nam
Viet Nam	Albert T.	Lieberg	FAOR	FAO Viet Nam
Viet Nam	Susan	Luu	Consultant on AMR	WHO
Viet Nam	Nguyen Thi Tuyet	Minh	National technical adviser on Biosecurity and Good Production Practices	FAO Viet Nam
Viet Nam	Takeuchi	Momoe	Team Coordinator, Health System Team	WHO
Viet Nam	Matthew R.	Moore	Director, Global Health Security Program	USCDC
Viet Nam	Ha Thi Tuyet	Nga	DG	CITES
Viet Nam	Bui Thi To	Nga	E-Learning coordinator	FAO Viet Nam
Viet Nam	Nguyen Thi Kim	Oanh	Vice Director	NCVD
Viet Nam	Michael	Oleary	Senior Infectious Diseases Advisor	USAID
Viet Nam	Satoko	Otsu	Head, Health Emergency and Food Safety Unit	WHO
Viet Nam	Pawin	Padungtod	ECTAD Senior Technical Coordinator	FAO Viet Nam
Viet Nam	Ha My	Ta	National Operations Assistant	FAO Viet Nam
Viet Nam	Nguyen Thi Thanh	Thuy	National Technical Advisor (Value chain and Traceability)	FAO Viet Nam
Viet Nam	Nguyen Thu	Thuy	DDG, Project Director	Department of Animal Health
Viet Nam	Dao Thu	Trang	Former Secretariat Manager	OHP secretariat
Viet Nam	Nguyen Duc	Trong	DDG	DLP
Viet Nam	Chu Van	Tuat	Deputy Director	NCVH1
Viet Nam	Nguyen	Tung	Project coordinator	Department of Animal Health
Viet Nam	Truong	Van Minh	Head of station for veterinary diagnosis	RAHO2



## Appendix 2. Country and regional offices visited during the evaluation

Countries	Funding level	Avian influenza outbreak prevention and disease control	One Health initiatives	ASL 2050	MERS-CoV	AMR	Regional role
Egypt	X	X	X	X	X		X
Kenya				X	X		X
Ghana							X
Nigeria		X		X			
Thailand							X
Bangladesh	X	X	X			X	
Viet Nam	X	X	X			X	
Lao People's Democratic Republic		X	X			X	

## **Annexes**

Annex 1. Terms of Reference and evaluation matrix  
<http://www.fao.org/3/cb3219en/cb3219en.pdf>

Annex 2. Portfolio analysis  
<http://www.fao.org/3/cb3221en/cb3221en.pdf>

Annex 3. Survey data analysis  
<http://www.fao.org/3/cb3222en/cb3222en.pdf>

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