Food and Agriculture Organization of the United Nations

STRENGTHENING ANIMAL DISEASE SURVEILLANCE IN LESOTHO

September 2019

SDGs:	
Countries:	Lesotho
Project Codes:	TCP/LES/3604
FAO Contribution:	USD 371 000
Duration:	2 January 2017 – 30 June 2019
Contact Info:	FAO Representation in Lesotho FAO-LS@fao.org

Implementing Partners

Ministry of Agriculture and Food Security (MAFS) and the Department of Livestock Services (DLS).

Beneficiaries

The livestock farming community, including both individual farmers and organized farmer formations; the DLS; the Department of Marketing (DoM); and the Ministry of Health (MoH).

Country Programming Framework

CPF outcome 4: Access to improved agricultural services by farmers strengthened.

Background

Over three-quarters of Lesotho's population resides in rural areas, with agriculture and livestock being central to their livelihood and the rural economy. In particular, sheep and goats produce wool and mohair, which are the primary national export commodity. The growth and sustainability of the sector, however, are threatened by a variety of factors, including the outbreak of animal diseases. The Government of Lesotho has recognized and acknowledged that the technical and operational capacities for dealing with animal disease have deteriorated, leaving the country with poor surveillance measures for early detection and rapid response.

In Lesotho, animal disease plays an important role in the national economy and trade. Late detection not only has devastating consequences for public health, it also affects access to markets. For example, anthrax outbreaks are typically only noticed after human fatalities have been reported. In the past, the apparent failure to contain anthrax outbreaks almost resulted in Lesotho losing out on trade opportunities with major importing countries, such as China. To prevent the reoccurrence of similar situations, Lesotho needs to implement an effective animal disease surveillance system that can determine the presence/absence of diseases and measure their prevalence and distribution. Perhaps more importantly, the system must also facilitate early detection of, and rapid response to, endemic, exotic and emerging diseases. Considering the threats posed by animal diseases, the Government of Lesotho requested FAO's support in strengthening veterinary services and developing a more effective animal disease surveillance system. Additionally, the project supported Lesotho's application for the status of historical freedom from *Peste des Petits Ruminants* (PPR).

Impact

The project supported the enhancement of food and income security in Lesotho, with a particular focus on improving livelihoods in the rural population. This was addressed through a concerted effort to uphold access to trade and safeguard the health of the people of Lesotho.

Achievement of Results

Output 1: An effective animal disease surveillance system established

Prior to the project, the system for animal disease surveillance and reporting in Lesotho did not meet international requirements or standards. Several training sessions were carried out to develop the capacity of technical officers working in the areas of animal health and production. These sessions covered (i) the recognition, diagnosis and surveying of PPR, (ii) Good Emergency Management Practices (GEMP) and (iii) disease surveillance and reporting. The existing reporting practices and routines were reviewed by an international consultant through face-to-face interaction with the epidemiology team. Subsequently, a training workshop was carried out for veterinary and livestock production personnel to raise awareness on the importance of effective animal disease surveillance, adherence to reporting standards for notifiable diseases and compliance with international standards for prevention and control of such diseases.

A SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of the existing disease surveillance system revealed that there was inadequate documentation, a lack of Standard Operating Procedures (SOPs) and weakly-defined reporting lines. The revised reporting protocol and SOPs created a platform for effective animal disease surveillance. Importantly, Information and Communication Technology (ICT) infrastructure was developed under the project, which included the procurement and distribution of computers and smartphones, as well as securing access to a stable internet connection for livestock personnel. Internet access allowed for the reporting of disease outbreaks and relevant information to district centres, which in turn relayed information to the central epidemiology unit. Additionally, communication between Veterinary Services in the MAFS and FAO's Emergency Prevention System Global Animal Disease Information System (EMPRES-i) greatly improved under the project.

Output 2: Piloting of Event Mobile Application (EMA-i) for livestock disease surveillance and reporting

The preparatory phase of the piloting activities involved contribution from the EMA-i team in Rome, the Lead Technical Officer (LTO) from the FAO Subregional Office for Southern Africa (SFS), the Livestock Emergency Officer in the FAO Subregional Emergency Office for Southern Africa (REOSA), the FAO Country Office and Veterinary Services in the MAFS. In September 2018, the EMA-i team carried out a one-week workshop for veterinary and animal production staff from central and decentralized offices, covering a broad range of topics, including (i) the prevailing state of surveillance, data collection and reporting on animal diseases in Lesotho; (ii) EMA-i technology and its implementation in other countries; and (iii) practical sessions on the creation and submission of disease reports, as well as how to access them in EMPRES-i. Following the workshop, however, it was apparent that many of the districts were not able to carry out the reports as expected. To address and troubleshoot specific issues, backstopping missions were carried out in the districts that required them, ultimately leading to the resolution of "early development" problems. By project closure, the system was functioning well, with the appropriate ICT infrastructure in place and the capacity for setting up EMA-i fully developed, facilitating the early detection and timely reporting of animal diseases. This ultimately supported the capacity for disease surveillance of Veterinary Services and allowed Lesotho to effectively collect and report data and respond to disease outbreaks.

Output 3: Status of *Peste des Petits Ruminants* (PPR) in Lesotho established

A PPR surveying protocol was created to guide veterinary field personnel through the collection, storage and transport of serum samples. All the necessary equipment/supplies were distributed to sampling sites and the sampling teams were appropriately trained. Overall, blood samples were collected from 3 200 animals from 131 woolsheds across the country. The preparation of samples for analysis was performed at the national veterinary laboratory and then shipped to the World Organisation for Animal Health (OIE) reference laboratory for PPR, *Centre de coopération internationale en recherche agronomique pour le développement* (CIRAD). The final analysis revealed that there was no evidence of PPR in sheep and goats in Lesotho. Subsequently, the Government of Lesotho applied to be officially declared free from PPR through the submission of a dossier, which was prepared together with an international consultant, to OIE on 30 June 2019.

The project was also responsible for developing national capacity for basic diagnosis of PPR and other common diseases. Critical laboratory equipment and supplies were delivered and training sessions were carried out for two laboratory technicians, supporting the capacity for early detection of, and rapid response to, animal diseases in Lesotho.

IMPLEMENTATION OF WORK PLAN

Delays were experienced during project implementation, largely stemming from the project's dependence on external inputs. Laboratory analysis of PPR samples, for example, could only be performed by CIRAD, the world reference laboratory. The results of their analysis took longer than anticipated due to a backlog at the facility. Additionally, since the EMA-i support team were engaged in multiple activities at the time, fielding the EMA-i mission took longer than expect to initiate. A no-cost extension was requested to accommodate for these delays.

The project was ultimately carried out within the approved budget. The project had originally envisioned substantial resources being allocated towards contracts. the anticipated contracts were determined to not be feasible during project implementation. Although the overall budget line for contracts did not change, over-expenditures were incurred for consultants, procurement and training. Additionally, the logistics involved in performing a nationwide blood sampling survey were more extensive than anticipated, resulting in increased expenditure (beyond the 5 percent threshold) on general operating expenses (GOE).

FOLLOW-UP FOR GOVERNMENT ATTENTION

Since effective surveillance of animal diseases is highly dependent upon continued internet connectivity, the DLS must budget accordingly to maintain the internet services established under the project. To ensure that the status of freedom from notifiable diseases is maintained, the revised surveillance and reporting measures that were introduced must be continually enforced. To facilitate the reporting process, additional efforts to familiarize animal husbandry and animal health workers with the scientific names of diseases should also be carried out. Additionally, to ensure that emerging challenges are addressed, continued interaction with the EMA-i and EMPRES-i teams at FAO Headquarters will be essential.

Since Lesotho was lacking legislation that specifically addresses PPR, it is critical that the draft PPR strategy developed under the project becomes endorsed as early as possible. The Director of Veterinary Services still needed to follow up with the Interafrican Bureau for Animal Resources (AU-IBAR) to expedite technical clearance of the draft. Once cleared, the draft can be used to guide the revision of livestock legislation so that it incorporates elements of PPR prevention.

SUSTAINABILITY

1. Capacity development

The project is fully embedded in the structure of Lesotho's Veterinary Services. Both the laboratory services and epidemiology units were involved in project operations and participated in the development of the new reporting system, which should support its continued use. The PPR strategy was drafted and livestock policy was in the process of being reviewed at project closure. Once the PPR strategy is endorsed, a stronger legal framework for the surveillance of animal diseases can be effectively put in place.

2. Gender equality

Both men and women stand to benefit from the improvement in animal health services developed under the project. The project was largely gender neutral, focusing primarily on technical aspects of reporting, which both male and female personnel could benefit from.

3. Environmental sustainability

The project did not address environmental sustainability and is not expected to impact the environment.

4. Human Rights-based Approach (HRBA) – in particular Right to Food and Decent Work

Although the project design was not explicit on the human rights-based approach, its actions have helped the livestock farming communities to realize the right to feed themselves with dignity (the right to adequate food).

5. Technological sustainability

The use of EMA-i technology is highly appropriate in Lesotho. It has already reduced the logistical difficulties of disease reporting between the central and decentralized structures of Veterinary Services. The technical and operational capacity of Veterinary Services personnel has been greatly developed regarding both the analysis and effective reporting of animal diseases. While this will support the continuation of activities beyond the life of the project, long-term political commitment will also be required to ensure that these efforts lead to an effective animal disease surveillance system.

6. Economic sustainability

The new reporting system is more cost effective than the previous paper-based report, which was both logistically challenging and often ineffective. The degree to which resource are allocated to continue the efforts of the project will be seen in the upcoming budget.

DOCUMENTS AND OUTREACH PRODUCTS

- Scoping Mission Report. M Mokopasetso. December 2017. 2 pp.
- Training Mission Report. M Mokopasetso. January 2018. 11 pp.
- EMA-i Launch – Back to Office Report. F Larfaoui and A Saidouni. September 2018.
- PPR Dossier Development and Validation Mission Report. M Mokopasetso. February 2019.
- PPR Dossier for Lesotho. G Mahloane. Maseru. June 2019. 30 pp.

ACHIEVEMENT OF RESULTS - LOGICAL FRAMEWORK

Expected Impact	**Improved livestock contribution to livelihoods, food security and sustainable economic growth**			
Outcome	Lesotho's capacity to detect, control and respond to priority (including transboundary) animal disease strengthened			
	Indicator	1. Existence of a functional and robust animal disease surveillance system 2. Successful application for historic freedom from PPR 3. Successful piloting of EMA-i for enhanced disease reporting		
	Baseline	1. A weak and dysfunctional animal disease surveillance and reporting system that does not meet international requirements, standards and guidelines 2. PPR status for Lesotho unknown 3. Weak and ineffective system disease reporting		
	End Target	1. An effective and fully functional surveillance system progressively complies with international requirements, standards and guidelines by the end of the project 2. PPR status assessed, completed and established to facilitate application for official recognition of disease freedom by the end of the project 3. A mobile phone based app for timely disease reporting set-up within six months of project implementation		
	Comments and follow-up action to be taken			
Output 1	An effective animal disease surveillance system established			
	Indicators		Target	Achieved
	Existence of a functional and robust animal disease surveillance system		An effective and fully functional surveillance system progressively complies with international requirements, standards and guidelines by the end of the project	Yes
Baseline	A weak and dysfunctional animal disease surveillance and reporting system that does not meet international requirements, standards and guidelines			
Comments	The building blocks for an effective animal disease surveillance system were established. Reporting protocols were streamlined and staff of the veterinary and animal production divisions were trained on disease detection, diagnosis and reporting. The ICT infrastructure was provided to the epidemiology unit, laboratory services and district-level Veterinary Services. Communication between central Veterinary Services and district-level services and sub-district structures improved as a result of internet connections and the use of EMA-i. Internet connectivity is critical for proper reporting and surveillance of animal diseases. The project provided the initial resources for securing the internet service provider. The existing contract with the service provider had been paid up until December 2019. From January 2020, the DLS had agreed to pay for the services. It is therefore critical for the sustainability of results achieved that the department sets aside a budget for maintaining these critical internet services.			
Activity 1.1	Develop protocols for technical reporting			
	Achieved	Yes		
	Comments	An international consultant reviewed the reporting practices and routines that were in place and made recommendations on how to improve them. This involved face-to-face engagement with the epidemiology team, followed by a training workshop for both veterinary and livestock production personnel. The focus of this workshop was to make participants understand the requirements for effective animal disease surveillance, adherence to the accepted standards for reporting notifiable diseases and compliance with international standards for disease freedom. A SWOT analysis was performed on the current disease surveillance system. Some of the weaknesses/threats that were identified include inadequate documentation, lack of standard operating procedures (SOPs) and weakly defined reporting lines. There were also concerns over the large vacancy factor within the veterinary services, which compromises the delivery of services across the country. The revised reporting protocol and the associated SOPs need to be enforced to ensure that the prevailing state of freedom from major notifiable diseases is maintained. This can be achieved through surveillance and use of the reporting system, which provide evidence regarding the state of freedom from major notifiable diseases.		

<table>
<tr><td rowspan="3">Activity 1.2</td><td colspan="2">Develop technical capacities of Area Technical Officers (ATO) and Agriculture Assistants (AA) on animal health issues</td></tr>
<tr><td>Achieved</td><td>Yes</td></tr>
<tr><td>Comments</td><td>Extensive training was provided to technical officers working on animal health and production issues as described below:
– The first training focused on how to recognise, diagnosis and survey PPR. Most participants were not familiar with the disease given its historic absence in Lesotho. The clinical manifestations of the disease were described in detail and clear distinctions were made between PPR and other diseases that present similar characteristic symptoms, such as pneumonia, diarrhoea, pyrexia and ocular and nasal discharges. The training also included an overview of the ongoing regional and international strategies for the control and eradication of PPR.
– The second training workshop addressed GEMP. The main objective of the training was to provide veterinary services with the skills to guide an effective national response on transboundary animal diseases (TADs). Basic elements of the training included command and coordination structures for managing TADs, preventing the incursion of TADs, rapid detection, taking early and effective action, emergency preparedness and contingency planning.
– The third and final training focused on broader disease surveillance and reporting. It was carried out prior to the introduction and roll out of the EMA-i system. Common animal diseases were described and methods for their prevention and control were communicated.
Additional work needs to be carried out to better familiarize the lower cadre of animal health/husbandry workers with the scientific names of common animal disease. Since they are more accustomed to using common names, this may create difficulties when reporting on international platforms like EMPRES-I and to the OIE.</td></tr>
<tr><td rowspan="3">Activity 1.3</td><td colspan="2">Improve access to internet</td></tr>
<tr><td>Achieved</td><td>Yes</td></tr>
<tr><td>Comments</td><td>Fourteen computers were procured, including one for each of the ten district veterinary offices and four for the headquarters of the epidemiology and veterinary public health units. In addition, 80 smartphones were procured for livestock personnel across all ten districts and the 68 sub-district centres (agricultural resource centres). Two additional computers were later procured for the epidemiology unit to enhance their capacity to collect, store and analyse disease information/data. To secure stable internet connectivity, a contract was established with the local service provider, providing about 3 GB of data monthly to all 80 smartphones. Users were able to report disease outbreaks or related information to their respective district centres, who could then transmit relevant information to the central epidemiology unit. As a result of improved internet access, communication and reporting between Lesotho's Veterinary Services and FAO's EMPRES also improved substantially. Lesotho was also able to report to OIE using the data generated from EMA-i.
It is critical that government maintains the internet access provided under the project by ensuring that it is budgeted for accordingly each year.</td></tr>
<tr><td rowspan="3">Output 2</td><td colspan="3">Piloting of Event Mobile Application (EMA-i) for livestock disease surveillance and reporting</td></tr>
<tr><td>Indicators</td><td>Target</td><td>Achieved</td></tr>
<tr><td>Successful piloting of EMA-i for enhanced disease reporting</td><td>A mobile phone based app for timely disease reporting set-up within six months of project implementation</td><td>Yes</td></tr>
<tr><td>Baseline</td><td colspan="2">Weak and ineffective system disease reporting</td></tr>
<tr><td>Comments</td><td colspan="2">The necessary ICT infrastructure and training were provided to set up the EMA-i for early detection and timely reporting of animal diseases, including zoonosis. The EMA-i facilitated data collection and real-time disease reporting to support the capacity of Veterinary Services in disease surveillance. As a result, Lesotho was able to collect and report data on, and respond to, disease outbreaks. The quality of information on disease outbreaks improved substantially and therefore allowed for the prevention and rapid respond to disease incursions.
Lesotho's Veterinary Services, through its decentralized structures, was able to collect epidemiological information from the field with EMA-i through the use of smartphones. Following data collection, disease events are transmitted from the field to the EMPRES-i platform, where the information is safely stored according to a well-defined workflow.
The central veterinary services still needed to develop a catalogue of common diseases and insert their common names in the EMA-i disease database. This would greatly improve disease identification and reporting because the Agricultural Assistants (the professional cadre that deal directly with farmers) are not very familiar with the scientific names of the diseases.</td></tr>
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Activity 2.1	Preparatory Phase	
	Achieved	Yes
	Comments	The preparatory phase went exceptionally well, with contributions being made by the EMA-i team in Rome, the LTO from the SFS, the Livestock Emergency Officer in the REOSA, the FAO Country Office and Veterinary Services in the MAFS. As specified in the project document, the implementation of EMA-i in Lesotho covered the entire country. The EMA-i team and Veterinary Services carried out pre-mission engagements and virtual meetings that: – identified and agreed on disease events that need to be included in the EMA-i database; – defined the workflow for data transmission between users, validators and the Chief Veterinary Officer; – identified the participants of the EMA-i piloting and established roles and responsibilities in the reporting scheme; – prepared SOPs; and – finalized technical specifications for procurement of the required equipment and supplies.
Activity 2.2	Implementation phase	
	Achieved	Yes
	Comments	Since the EMA-i team was engaged in other activities, getting started on the implementation phase took longer than anticipated. The mission ultimately took place in September 2018. The team performed a one-week workshop for veterinary and animal production officers from both central and decentralized offices. The training was preceded by the configuration of smartphones for both EMA-i and EMPRES-i, which involved the installation of EMA-i systems and email accounts. The topics covered by the training included: – The state of animal disease surveillance, data collection and disease reporting in Lesotho. – A presentation of EMA-i methodology and how it had worked in other countries. – Practical sessions on how to create and send a disease report and how to access and edit the report in EMPRES-i.
Activity 2.3	Evaluation phase	
	Achieved	Yes
	Comments	Upon completion of the training by the EMA-i team, district and sub-district offices were expected to send reports to the epidemiology unit. Only a few districts of the districts, however, were able to report as expected. Support missions were carried out in respective districts to understand what the issues were and to help troubleshoot them. These backstopping missions, together with virtual meetings held with the EMA-i team in Rome, were able to resolve most of these “early development” problems. The challenges were more pronounced in districts where veterinary officers were less competent in the use of the newly introduced technology. By project closure, the system was working to the satisfaction of all concerned stakeholders. Constant engagement and interaction with the EMA-i and EMPRES-i teams in Rome will be critical to track the latest developments and address emerging challenges. It will also be crucial to arrange a workshop on the lessons learned and identify the key follow-up actions in order to strengthen the disease surveillance system in Lesotho.

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<tr><td rowspan="3">Output 3</td><td colspan="3">Status of Peste des Petits Ruminants (PPR) in Lesotho established</td></tr>
<tr><td>Indicators</td><td>Target</td><td>Achieved</td></tr>
<tr><td>Successful application for historic freedom from PPR</td><td>PPR status assessment completed to facilitate application for official recognition of disease freedom by the end of the project.</td><td>Yes</td></tr>
<tr><td>Baseline</td><td colspan="3">PPR status for Lesotho unknown</td></tr>
<tr><td>Comments</td><td colspan="3">The surveillance protocol was developed based on the sheep and goat populations and their distribution at district level. SOPs were developed and shared with all concerned to facilitate the process of collecting blood samples across the country. The OIE reference laboratory for PPR (CIRAD) was requested to assist with the testing of blood samples and they provided all the necessary guidance on the documentation required for the submission of samples. The PPR serological survey was carried out as planned and the samples were shipped to CIRAD for analysis. The overall results were satisfactory (i.e. there was no evidence of PPR in sheep and goats). False positives were observed in a few districts (Berea, Qacha’s Nek and Leribe), which demanded retesting. All the false positives were cleared after the retesting carried out by CIRAD, thus confirming the historic absence of the disease in Lesotho.
The Government of Lesotho, with the support of an international consultant, submitted a dossier to OIE on 30 June 2019 so that Lesotho could be officially declared free from the disease. One of the concerns raised by the consultant was that the country lacked legislation that specifically addresses PPR. It is therefore critical for the draft PPR strategy to be endorsed and the related legislative review to be completed before the upcoming sitting of OIE structures in November 2019.</td></tr>
<tr><td rowspan="3">Activity 3.1</td><td colspan="3">Surveillance and epidemiology</td></tr>
<tr><td>Achieved</td><td colspan="2">Yes</td></tr>
<tr><td>Comments</td><td colspan="2">With the assistance of an international consultant, the survey protocol was designed, outlining the sample size and sampling units. The purpose of the protocol was to guide veterinary field personnel through the appropriate steps to be followed for collecting, storing and transporting serum samples for PPR surveillance. The guiding objectives of the protocol were:
– To collect statistically representative serum samples from the population of sheep and goats in Lesotho.
– To analyse these samples with an officially recognized diagnostic assay from an FAO/OIE reference laboratory in order to demonstrate the absence of PPR antibodies in sheep and goat populations in Lesotho.
Woolsheds were considered the best sampling units as they are traditional used for similar exercises. In total, 3200 sheep and goats were sampled across the ten districts, covering 131 woolsheds. The necessary supplies and materials, including data collection tools and questionnaires for epidemiological interviews, were provided and the sampling teams were mobilized and trained.</td></tr>
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Activity 3.2	Laboratory analysis	
	Achieved	Yes
	Comments	The project supported the logistics and provided all the necessary equipment and supplies for the collection, storage and transportation of blood samples at 131 woolsheds across the country. Samples were collected from 3200 animals according to the agreed sampling protocol and the initial preparation of samples for analysis was performed at the national veterinary laboratory before shipping the entire consignment to the PPR reference lab (CIRAD) in France. As expected, the final analysis found no evidence of PPR in sheep and goat flocks, paving a way for the country to apply for an official status of freedom from the disease. Importantly, the project developed capacity for the basic diagnosis of PPR and other common diseases. Critical equipment and supplies, such as freezers, Enzyme-Linked Immunosorbent Assay (ELISA) kits, a biosafety cabinet, centrifuge machines and reagents were procured for the central laboratory. Two laboratory technicians were also trained on serological diagnosis of PPR and the use of *Brucella* complement fixation tests. These trainings, together with the provision of equipment and supplies, enhanced the capacity of laboratory services to perform basic disease diagnostic tests, which are critical for early detection and response. The laboratory facilities (buildings and water system) need urgent attention through refurbishment if they are to effectively support disease surveillance, detection and reporting.
Activity 3.3	PPR preparedness and contingency plans	
	Achieved	Partially
	Comments	An outline for the PPR preparedness plan was developed with the assistance of an international consultant. The National Veterinary Service was expected to finalize the plan through consultation with other stakeholders, including the decentralized structures. The Director of Veterinary Services still needed to follow up with the AU-IBAR to expedite the technical clearance of the draft PPR strategy. Once cleared, it was recommended that livestock legislation be reviewed and revised so that elements of PPR prevention could be included.

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CA8858EN /1/4/20