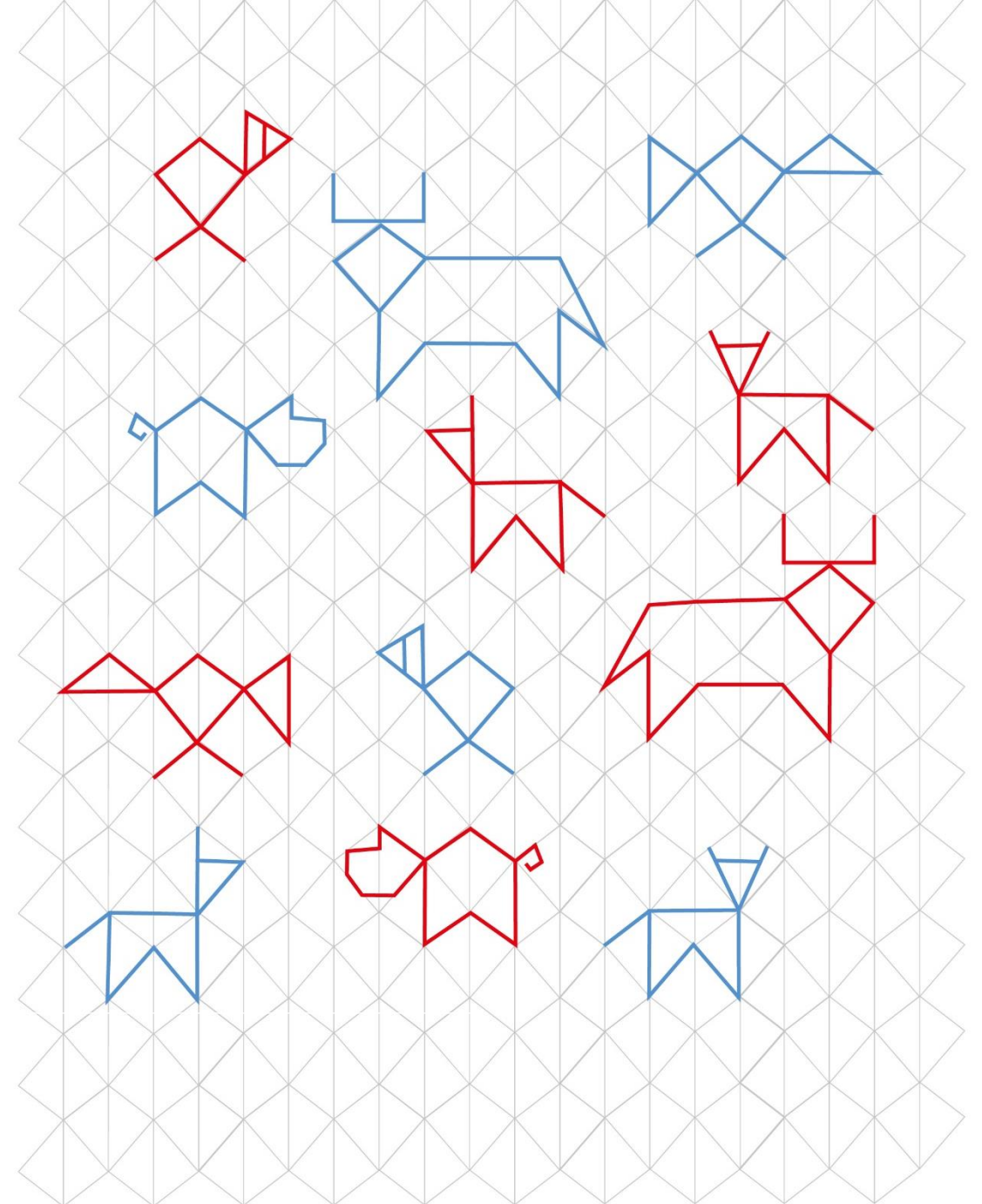


# **The experience in developing and implementing Foot-and-Mouth Disease (FMD) control strategy in Saudi Arabia**

**Dr. Sanad Al-Harbi**

**Head of the Animal Health Sector at the WEQAA Center  
The Delegate of the World Organization for Animal Health to the  
Kingdom of Saudi Arabia**



## Veterinary services in Saudi Arabia in relation with control strategies of Disease.

- ❑ The Ministry of Environment, Water and Agriculture (MEWA) has developed a National Strategy for Agriculture (2030) in line with the Kingdom's Vision 2030.
- ❑ The WEQAA Center started its activities in 2022 with a new perspective of the Official Veterinary Services (VS) and their activities at all levels.
- ❑ WEQAA Center developed a comprehensive strategy with a 5-year operational plan (2022-2027).
- ❑ WEQAA Center elaborated its strategy and programs and developed several procedures and technical guidelines to achieve its targeted goals of preventing and controlling of plant pests & animal diseases.



وزارة البيئة والمياه والزراعة  
Ministry of Environment Water & Agriculture



مركز وقاء | WEQAA CENTER  
المركز الوطني للوقاية من الآفات النباتية والأمراض الحيوانية ومكافحتها  
National Center for the Prevention & Control of Plants Pests & Animal Diseases

## Current FMD Disease Status in Saudi Arabia:

- ❑ FMD is an endemic disease in Saudi Arabia with continuous intensive control measures.
- ❑ The FMD infection hotspots are controlled and contained through intensive control efforts.
- ❑ The total new FMD outbreaks in the KSA was 221 in 2023 and declined to 146 in 2024.
- ❑ All the serotypes detected were O serotype.
- ❑ A biannual national mass vaccination program is implemented.



*FMD outbreaks in 2023  
Total no= 221*



*FMD outbreaks in 2024  
Total no= 145*

## Global PCP-FMD strategy

Saudi Arabia followed the global PCP-FMD strategy, and the progress FMD-PCP stages is as follows:

- In **stage 1** in 2012 and 2013
- In **stage 2 provisional** from 2014-2021.
- In **stage 2 official** in 2022. The Risk-based Strategic Plan (RBSP) was implemented.

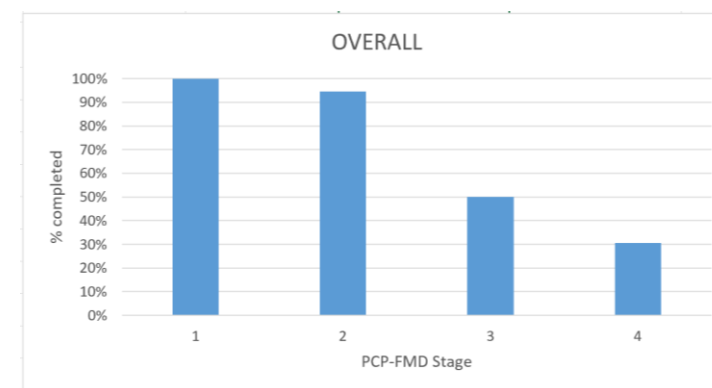
| Countries          | Validated Stages |      |      |      |      |      |      |      |      |      | Expected Stages (not validated) |      |      |      |      |
|--------------------|------------------|------|------|------|------|------|------|------|------|------|---------------------------------|------|------|------|------|
|                    | 2012             | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022                            | 2023 | 2024 | 2025 | 2026 |
| Bahrain            | 1                | 2    | 2    | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2    | 2                               | 2    | 3    | 3    | 3    |
| Egypt              | 1                | 1    | 2*   | 2*   | 2*   | 2    | 2    | 2    | 2    | 2    | 3                               | 3    | 3    | 4    | 4    |
| Iraq               | 2                | 2    | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2*                              | 2*   | 2*   | 2    | 3*   |
| Jordan             | 1                | 1    | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2                               | 2    | 3    | 3    | 3    |
| Kuwait             | 2                | 2    | 3    | 3*   | 3*   | 3*   | 3*   | 3*   | 3*   | 3*   | 3                               | 3    | 3    | 3    | 3    |
| Lebanon            | 1                | 1    | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2                               | 2    | 3    | 3    | 3    |
| Libya              |                  |      |      |      |      |      |      |      |      | 1*   | 1                               | 2    | 2    | 2    | 3    |
| Oman               | 2                | 2    | 2*   |      |      |      |      |      |      | 2*   | -                               | -    | -    | -    | -    |
| Palestine          |                  |      | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 2    | 2                               | 2    | 3    | 3    | 3    |
| Qatar              | 2                | 2    | 3*   | 3*   |      |      |      |      |      | 3*   | 3                               | 3    | 4    | 4    | OIE  |
| Saudi Arabia       | 1                | 1    | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2                               | 3    | 3    | 3    | 4    |
| Syria <sup>1</sup> | 2                | 2    | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   |      | -                               | -    | -    | -    | -    |
| UAE                | 1                | 1    | 2    | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2*   | 2                               | 3    | 3    | 3    | 4    |
| Yemen              | 1                | 1    | 1*   |      |      |      |      |      |      | 0    | 1                               | 1    | 2    | 2    | 3    |

## The Self Assessment Tool for the PCP-FMD Ver.02 ( 20 April 2025)

- The latest self assessment of FMD in Saudi Arabia using Self Assessment Tool for the PCP-FMD Ver.02 revealed continuing in the **Stage 2** reaching **94%** of the overall activities with completing 50% of the stage 3 and 31% of the stage 4.

### Results of PCP-FMD Ver.02 assessment

|             | PCP Stage   | Livestock sector and stakeholders | Surveillance and diagnostics | Prevention control and evaluation | Veterinary Services | OVERALL |
|-------------|-------------|-----------------------------------|------------------------------|-----------------------------------|---------------------|---------|
| % completed | 1           | 100%                              | 100%                         | 100%                              | 100%                | 100%    |
|             | 2           | 80%                               | 92%                          | 100%                              | 100%                | 94%     |
|             | 3           | 20%                               | 62%                          | 55%                               | 43%                 | 50%     |
|             | 4           | 20%                               | 31%                          | 45%                               | 14%                 | 31%     |
|             | Reliability | 100%                              | 100%                         | 100%                              | 100%                | 100%    |



## Control strategy of FMD outbreaks in Saudi Arabia

- ❑ **Risk-based strategic plan was endorsed by the Regional Advisory group in ME-GF-TAD in 2021.**
- ❑ **RBSP** was implemented in 2022, targeting the dairy product system most affected by the disease.
- ❑ The objective of FMD RBSP is to decrease the impact of FMD in the cattle population in Saudi Arabia, mainly by eliminating clinical cases and decreasing infection rates among dairy farms in 3-year period.
- ❑ The RBSP is included in establishing safe zones with a depth of 5 kilometers around each dairy farm, where livestock rearing around dairy projects is regulated, and disease control is enforced in rural holdings surrounding these projects.



## **Prevention and control measures that support level up to PCP-FMD Stage 3**

## Epidemiological Surveillance

**The objective is to collect field data, identify infected areas, and analyze transmission pathways.**

### **Active Surveillance:**

Active surveillance was conducted on a national level, with approximately 13,000 serum samples collected in 2024. This process is repeated every two years.

### **Passive Surveillance:**

Required data is compiled through:

- 1.The "An'am" platform (weekly, monthly, quarterly, and annual reports).
- 2.The "Nama" platform.
- 3.Emergency hotline.

### **Disease Surveillance:**

FMD surveillance is conducted in dairy farms, markets, holdings, and through serological investigations, both in small holdings and dairy projects

There are several supporting systems used in the investigation processes:

- 1.Early Warning System.
- 2.Geospatial Mapping System.
- 3.Surveillance Platform.



## FMD Vaccination

### **Periodic Preventive Vaccination:**

- An adequate vaccine supply is secured, with (40) million doses available annually.
- The efficacy of any vaccine used within the Kingdom is evaluated by the WEQAA Center before recommendation for approval by the SFDA through a mechanism accredited by the Center.
- Susceptible animals across all regions of the Kingdom are vaccinated through two campaigns conducted annually, synchronized with other vaccines, aiming to achieve a coverage rate of up to 90% of the susceptible livestock population.

**Ring Vaccination for Control:** Vaccination is carried out in a circular area with a 10-kilometer radius around the infection focus, proceeding from the outer perimeter inward, targeting holdings surrounding the infection focus.

**Post-vaccination monitoring (PVM)** is conducted after each campaign to measure the efficacy of vaccination activities.

## Implementing the Standard Operating Procedures (SOPs) for sample collection and Rapid Response



### Rapid Response:

Reports are addressed within 24 hours from the time of notification.

The SOPS is implemented from receiving the disease notification to control the outbreak including clinical diagnosis, lab confirmation and control of outbreak foci.

### There are dedicated and ready field teams responsible for:

- Isolating infected animals.
- Collecting suspected samples and properly sending them to the laboratory.
- Disinfecting infected sites.
- Imposing restrictions on animal movement.
- Implementing the SOPs for managing the diseases.
- Enhancing biosecurity measures in infection foci.

# Contingency Plan



## Controlling Outbreaks of Foot-and-Mouth Disease (FMD):

An emergency response plan has been developed to control FMD outbreaks or in the event of the introduction of new serotypes or strains into the Kingdom.

### 1. Preparedness Phase:

Enhancing readiness through laboratory capacity building, staff training, and surveillance planning.

### 2. Response Phase – Emergency Classification:

FMD emergencies are classified into two levels:

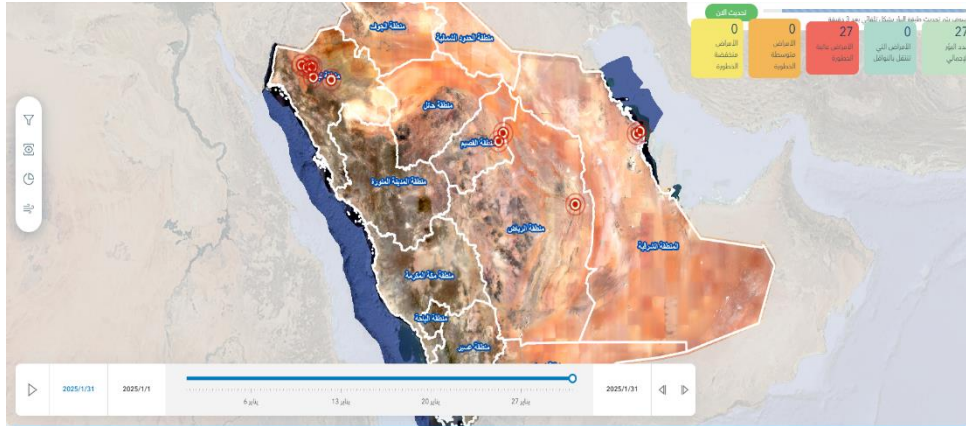
- Emergency Level 1:** Declared upon suspicion of increased FMD cases beyond normal levels or presence of unusual clinical signs (suspected case), and remains until laboratory confirmation.
- Emergency Level 2:** Declared upon laboratory confirmation of a new FMD virus strain (confirmed case) and remains until the region is officially declared disease-free.

### 3. Recovery and Declaration of End of Emergency Phase:

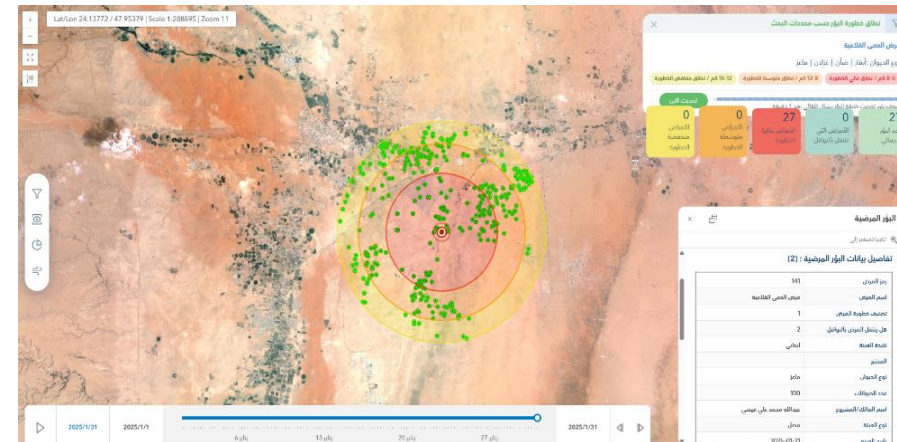
This phase begins when epidemiological surveillance, laboratory testing, and data analysis confirm the absence of the disease in the area. The farm or area may be declared disease-free based on established timelines and re-entry protocols

## Establishment of digital platforms the supports early warning, Monitoring, and data recording.

Many digital platforms that support early warning, monitoring, and data recording, such as Anaam platform, Geospatial platform, Nama platform, surveillance platform, and Early Warning platform.



Geospatial platform



Early warning platform

# Laboratory Capacities

## Enhancing Laboratory Capacities

There are 13 well-equipped and qualified animal health laboratories to perform the following diagnostic tests for FMD:

- 1.Real-Time Polymerase Chain Reaction (rt-PCR):** Used for confirming FMD virus infection through molecular detection.
- 2.Non-Structural Protein ELISA (3ABC-ELISA):** Detects antibodies indicating infection with FMD virus (DIVA test)
- 3.Antigen ELISA (Ag-ELISA):** Used for serotyping the FMD virus (identifying the specific serotype involved).
- 4.Conventional PCR:** Used to classify the virus further through genetic analysis.
- 5.Gene Sequencing using Next-Generation Sequencing (NGS):** Performed at the Centra Veterinary Laboratory (CVL) in Riyadh for detailed molecular characterization of the virus.
- 6.Interlaboratory Comparison Testing:** Regular internal quality assessments are conducted by the CVL in collaboration with regional laboratories to ensure consistency and accuracy across all laboratories.

# Field Veterinary Capacity Efficiency

## Enhancing the Capacities of Field Veterinary Personnel

Veterinarians, veterinary assistants, and laboratory technicians are regularly trained and qualified through specialized training programs.

**These programs focus on:**

- 1.Preventive and Control Measures:** Training in appropriate methods for the prevention and control of TADs.
- 2.Emergency Response Procedures:** Developing the ability to respond promptly and effectively to outbreak situations by following the national emergency protocols.
- 3.Disease Recognition and Reporting:** Enabling field staff to recognize early clinical signs of FMD outbreaks and understand proper procedures for reporting suspected cases.
- 4.Biosecurity Practices:** Educating personnel on biosecurity protocols, including the safe disposal of infected or dead animals and contaminated materials to prevent further spread of the disease.



## FMD Simulation Exercise and training courses

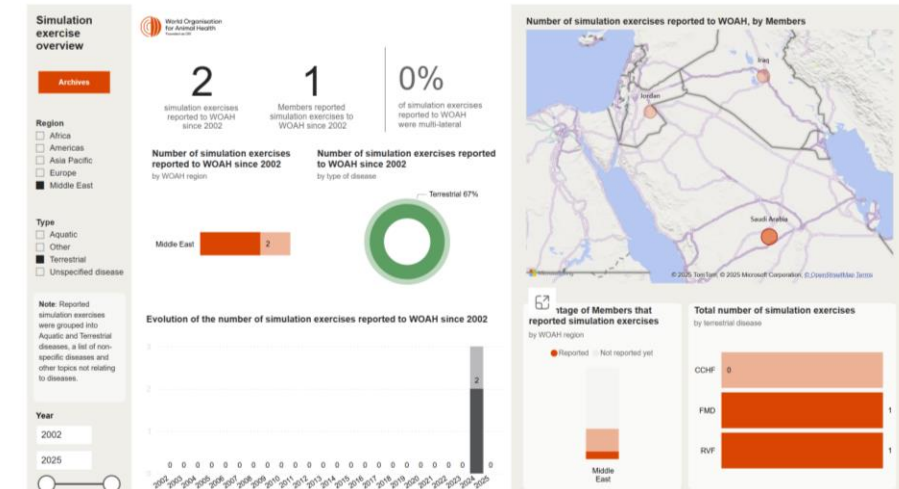
### FMD simulation exercise was conducted on 14-15 December 2024

The FMD simulation aimed to:

- test the preparedness of emergency response teams and their rapidity in responding.
- to identify gaps
- improve response time and overall effectiveness.

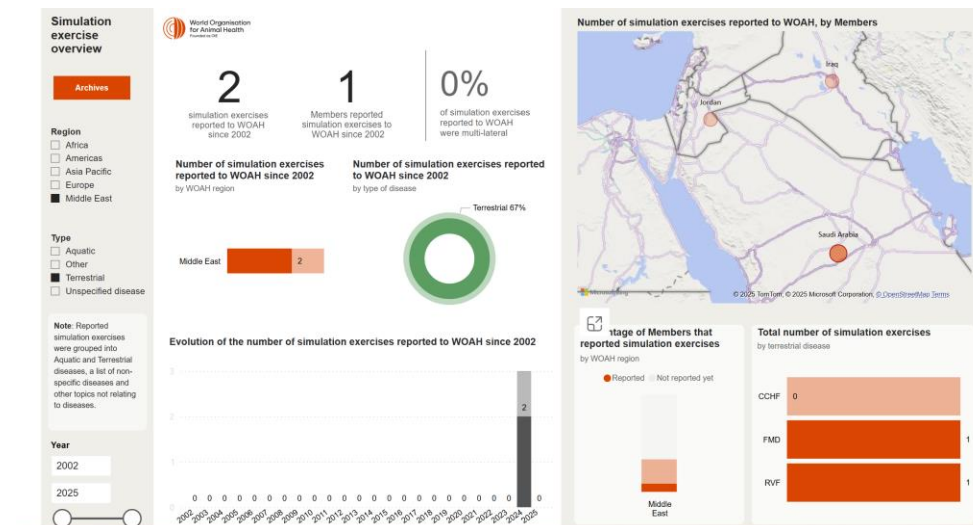
### Training Courses:

- The training courses including specialists (vets, vet assistants, and lab technicians) in both the public and private sectors are trained and qualified through periodic specialized courses.



# The Performance of Veterinary Services (PVS) Pathway

WOAH PVS expert visit was conducted from 17-28 December 2023, and the evaluation report was directed and considered in the self evaluation of high priority diseases in KSA and in developing and updating FMD control strategies.





## Awareness and Guidance and Partnership with Stakeholders

### **Awareness and Guidance among Livestock Farmers:**

Information is provided on the importance of and how to implement biosecurity measures and periodic vaccination for disease prevention, how to recognize signs of infection, the necessity of reporting the disease, and the required procedures to reduce disease spread, using various communication media targeted at livestock farmers.

### **Partnership with Stakeholders**

- The Veterinary Dairy Council was established with the aim of unifying the efforts of dairy producers in the field of controlling priority epidemic diseases targeted by the center.
- Regular meetings are held to discuss the general situation of livestock in the Kingdom, ways to develop it, the epidemiological status of diseases, and to review the joint action plan.

## Performance and Success Indicators:

### Performance Indicators:

Number of vaccinated animals.

- Number of outbreaks contained annually.
- Vaccination coverage rate in the regions.
- Average response time for each case.
- The reporting rate compared to the actual number of cases.
- Beneficiaries' satisfaction with the procedures.

### Success Indicators:

- Decrease in the number of outbreaks annually.
- Increase in vaccination coverage rate.
- Reduction in mortality cases related to the disease.
- Stabilization of livestock prices.

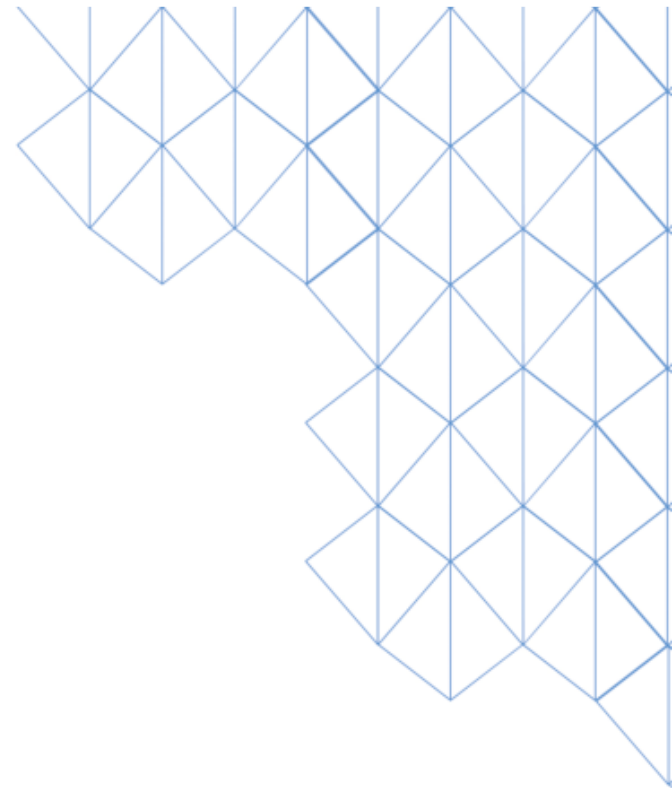
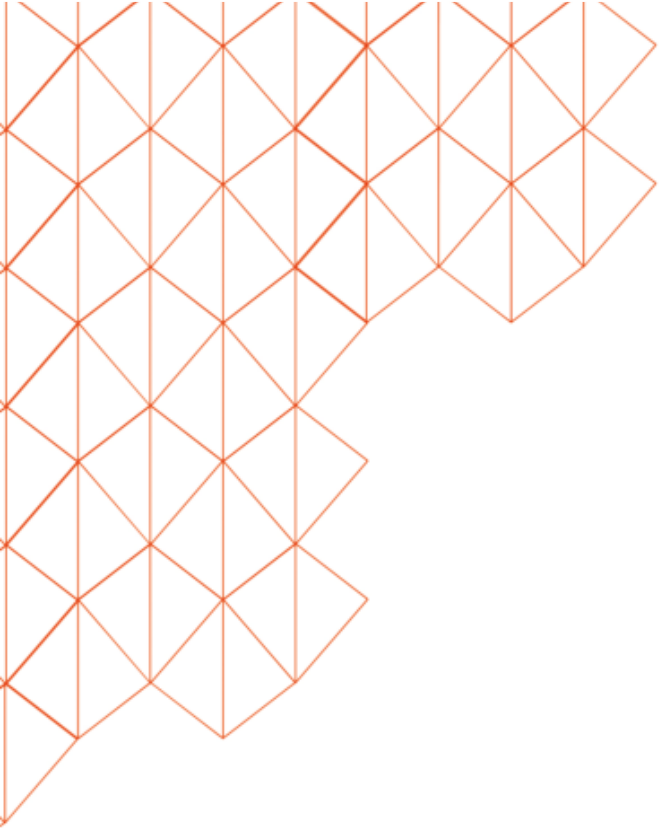
## The official Control Program (OCP) for controlling FMD infection

It is expected to complete the Official Control Program (OCP) of the FMD by the end of this year and will be submitted to the GF-TADs Working Group for entry into PCP-FMD Stage 3.

The OCP will be involved in the following criteria:

- the situation analysis will clearly describe the results from the implementation of the RBSP.
- The strategic objective is coherent with PCP-FMD Stage 3.
- The planned activities will be designated to achieve the stated objectives, and all the key.
- Outcomes from PCP-FMD Stage 3 will be addressed.
- Resources will be available.
- The budget is available from the government.

|                                      | 2018                | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026                | 2027 | 2028 |
|--------------------------------------|---------------------|------|------|------|------|------|------|------|---------------------|------|------|
| Stage provision                      | stage 2 provisional |      |      |      |      |      |      |      | Stage 3 provisional |      |      |
| Updated estimation from 2022 onwards |                     |      |      |      | 2    |      |      |      |                     | 3    |      |



Thank You