Food and Agriculture Organization of the United Nations

World Organisation for Animal Health
Founded as OIE

Report on the FMD situation in *Republic of Sudan*

Consultative seminar on progress made in FMD/PPR roadmaps for East Mediterranean countries
Beirut-Lebanon
11-12 September 2022

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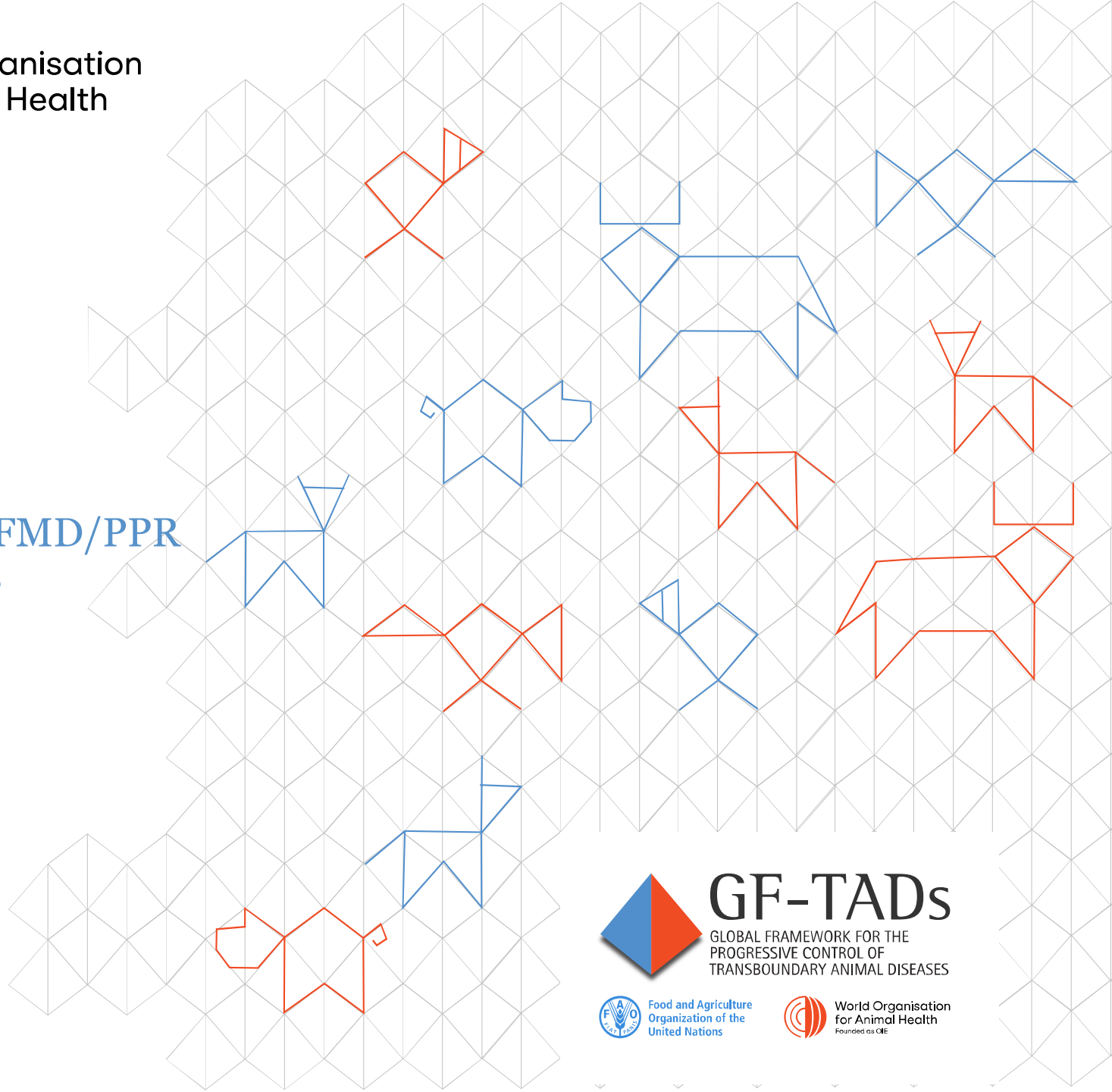
Ministry of Animal Resources



GF-TADs
GLOBAL FRAMEWORK FOR THE PROGRESSIVE CONTROL OF TRANSBOUNDARY ANIMAL DISEASES

Food and Agriculture Organization of the United Nations

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Background

Country Profile

The Republic of Sudan is a vast country in Africa (third largest in Africa), with an area of approximately 1.5 million km2 .

Sudan border Central African Republic, Chad, Egypt, Eritrea, Ethiopia, Libya, and South Sudan.

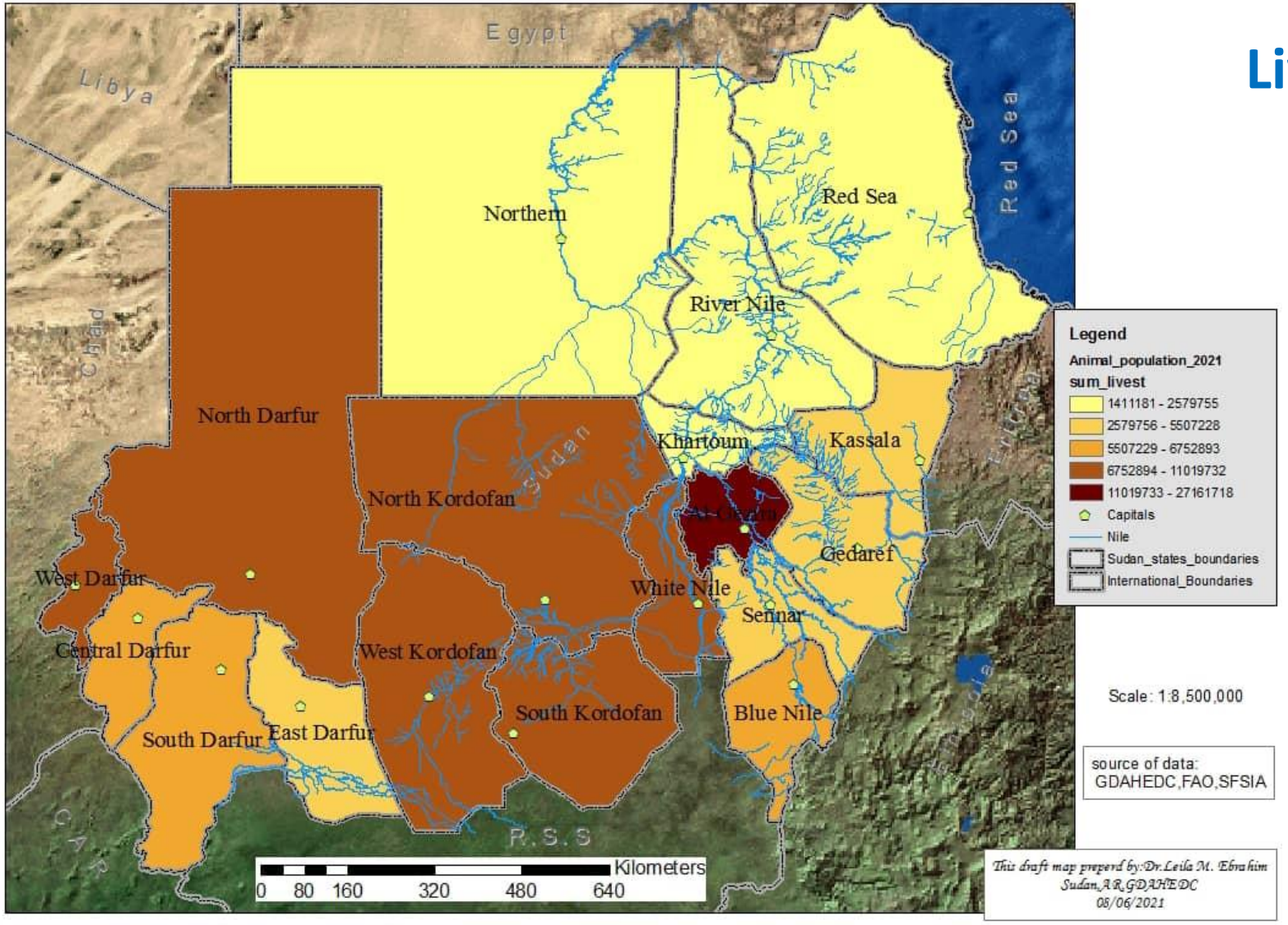
It is a decentralized system with independent governance at the state level.

The country divided administratively into 18 states.

The States are further divided into localities and administrative units.

Background

Sudan: Estimates of Livestock Population by state(head) 2021



Livestock population in Sudan

Sudan Total Livestock Population

Species	Estimated number
Cattle	32081000
Sheep	41127000
Goats	32402000
Camels	4944000
Total	**110554000**

Transboundary animal diseases

- Transboundary animal diseases (TADs) are highly contagious and have the potential to rapidly spread, irrespective of borders, causing serious socio-economic damage and disrupt or hinder domestic production and sales and international trade of livestock and livestock products.
- Of these FMD pose a continuous threat at the global, regional and national levels

FMD situation in Sudan

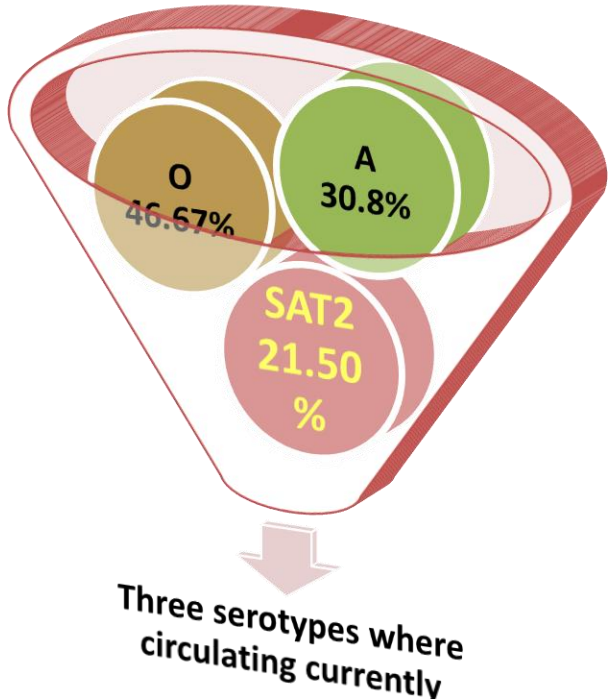
In Sudan, FMD is ENDEMIC

Mostly in the southern, south east and South West parts of the country bordering republic of South Sudan, Ethiopia, Eretria, Central Africa Republic (CAR) and Chad and in these states outbreaks of FMD are reported almost every year (AHEDC, 2003)

The disease is reported sporadically in the interior parts of the country; however periodic epidemics also occur.

The main serotypes recorded in the country against the years

Serotype	Year
O	1961, 63,70,73,74,75,77,79,80,83,86,89, 1999, 2004, 2005,2006, 2008, 2009, 2010, 2011
A	1960, 66, 67, 68, 69, 75, 77, 81, 82, 84, 1985, 2006, 2011
SAT1	1961, 63, 69, 74, 76.
SAT2	1977, 2007, 2008, 2010.

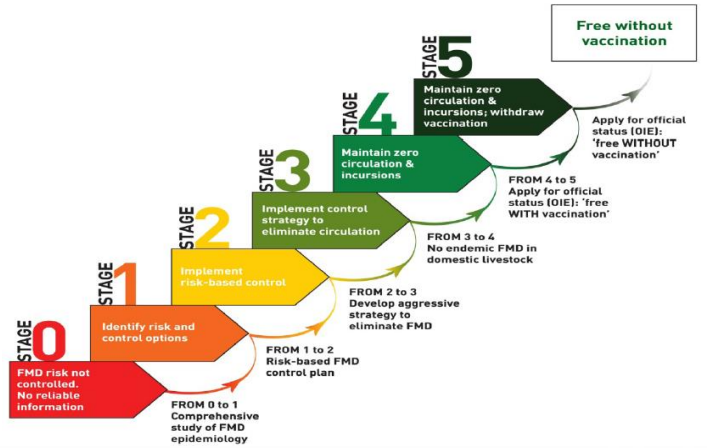


Cont…

FMD control strategy and action plan are in place and aligned with the regional and the global strategy for FMD control and it is prescribed PCP.

Sudan is evaluated in the **4th GF-TADs Eastern Africa Roadmap Meeting for FMD**, held online in March 2022 to be **maintained in provisional stage 2** with a 6- month to re-submit the RBSP with support of the PSO.

The RBSP is re- submitted in the last July 2020.

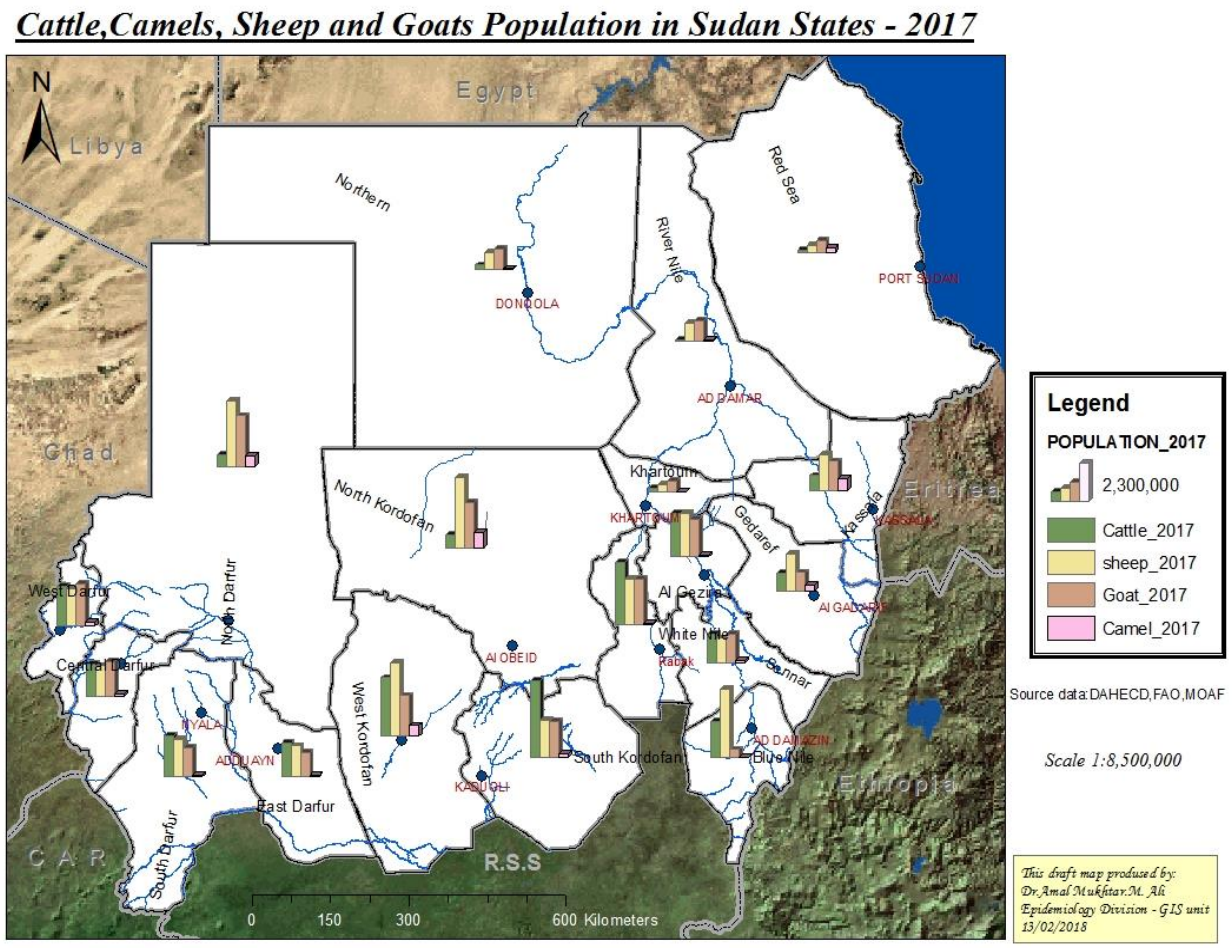


	Validated Stages											Provisional Stages			
Country	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Burundi	1	1	1	1	1	1	0	0	0	0	0				
Djibouti	1	1	1								1*				
Eritrea	1	1	1	1	1	1	1	1	1	1					
Ethiopia	1	1	1	1	1	1	1	1	1	1	1				
Kenya	1	1	1	1	1	1	1	1	1	2	2				
Rwanda	1	2	2	2	2	2	2	2	2	2	2				
Somalia	1	1	1	1	1	1	1	1	1	1	1*				
South Sudan	0	1	1*	1*	1*	1*	1	1	1	1					
Sudan	1	2	2*	2*	2*	2*	2*	2*	2*	2*	2*				
Uganda	1	1	1	1	2	2	2	2	2	2	2				

Sudan: maintain in provisional Stage 2, with a 6-month period to re-submit the RBSP with support of the PSO

Uganda: maintain in Stage 2, recommendation to continue revising the RBSP and finalizing within 6-month and enhance PPP in in the RBSP

progress made in the surveillance and control

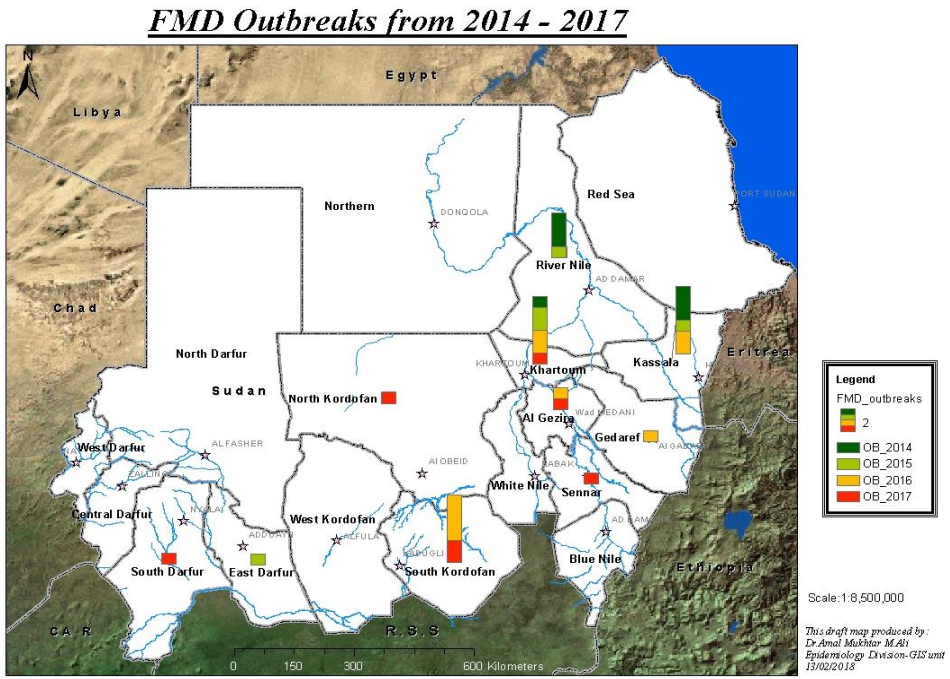


Progress made along Stage 1 - Component1

Livestock density and distribution (maps). Value chain analysis results

- In general, the livestock value chains operate in an enabling environment which is improving over time but is not yet fully studied to facilitate the competitiveness that allows actors to seek and expand opportunities

progress made in the surveillance and control



FMD clinical outbreaks

Year	Species	No. Outbreak	Serotype
2013	Cattle	8	O & SAT2
2014	Cattle	4	O
2015	Cattle	5	Not typed
2016	Cattle	10	O
2017	Cattle	7	Not typed
2018	Cattle	2	Not typed
Total		36	

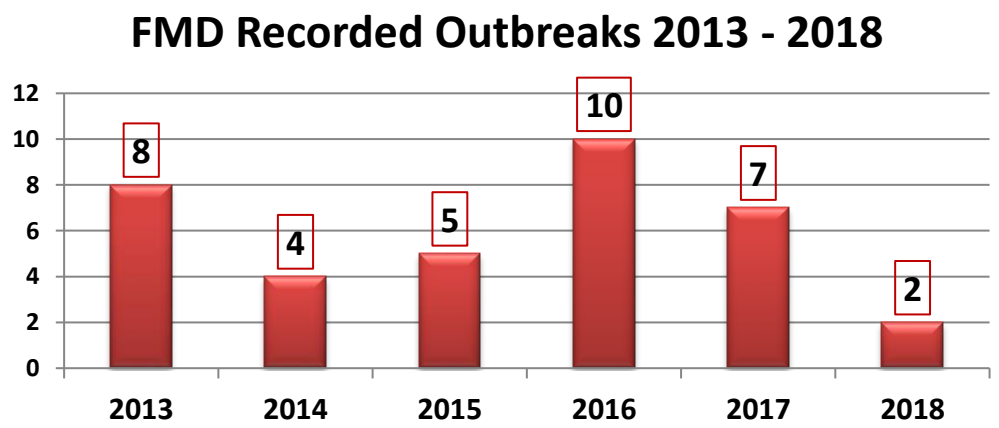
Progress made along Stage 1 - Component 1

FMD outbreaks

Number of samples prepared to be sent to WRL are: 30 – 40

In response to limit the spread of FMDV:

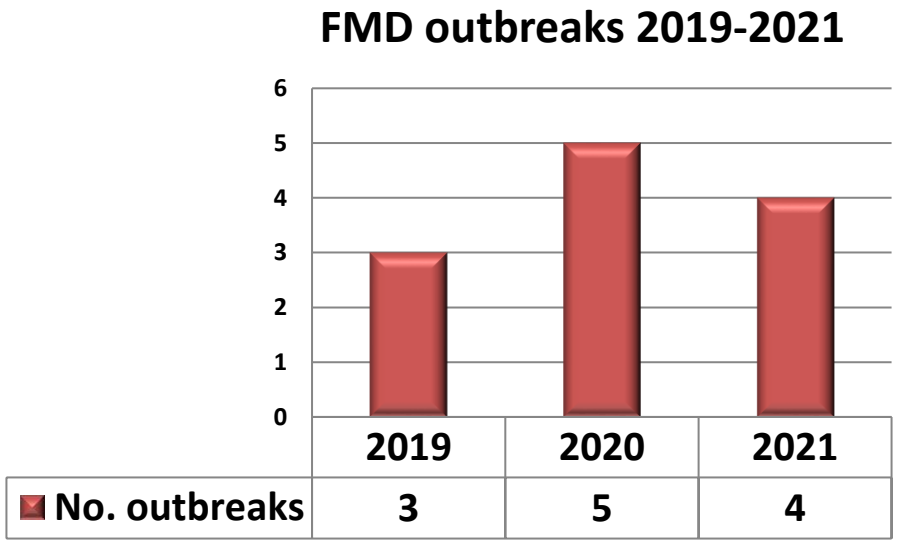
- **Animals are Quarantined**
- **Movement control,**
- **Implementing bio-security measure.**
- **Precautions at the borders**



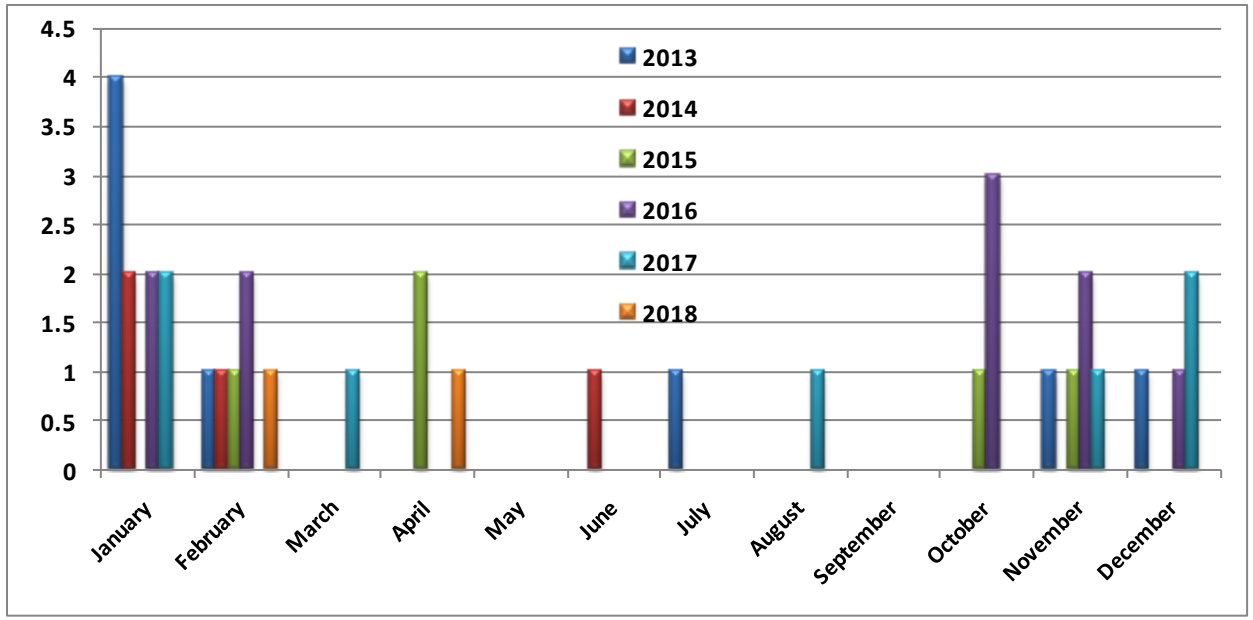
progress made in the surveillance and control

FMD outbreaks 2019-2021

year	Species	No. outbreak	Serotype
2019	Cattle	3	Not typed
2020	Cattle /Sheep	5	Not typed
2021	cattle	4	Not typed
		12	



FMD seasonal occurrence



The disease shows some seasonal pattern with peak occurrence during the cold (December –up to February) and after rainy seasons (October up to December)

progress made in the surveillance and control

Progress made along Stage 1 - Component 1

Surveillance

Passive Surveillance:

Notifications received from:

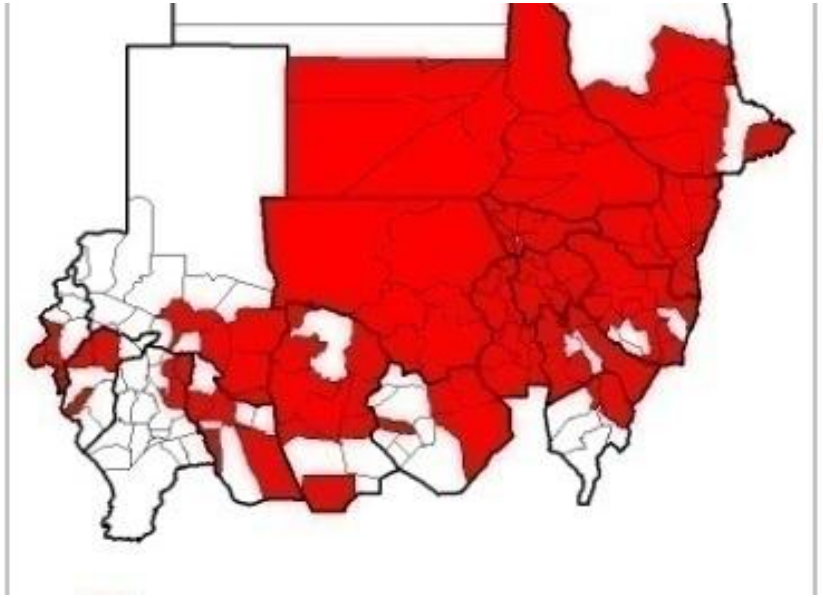
- States at different levels from livestock owners/ producers, veterinarians at the field, slaughter house/abattoir inspection or diagnostic laboratory .
- Monthly reports receive from all Sudan states through notification network .
- Data collated, is compiled and be used by the CVO for decision and the relevant stakeholders.

Active surveillance:

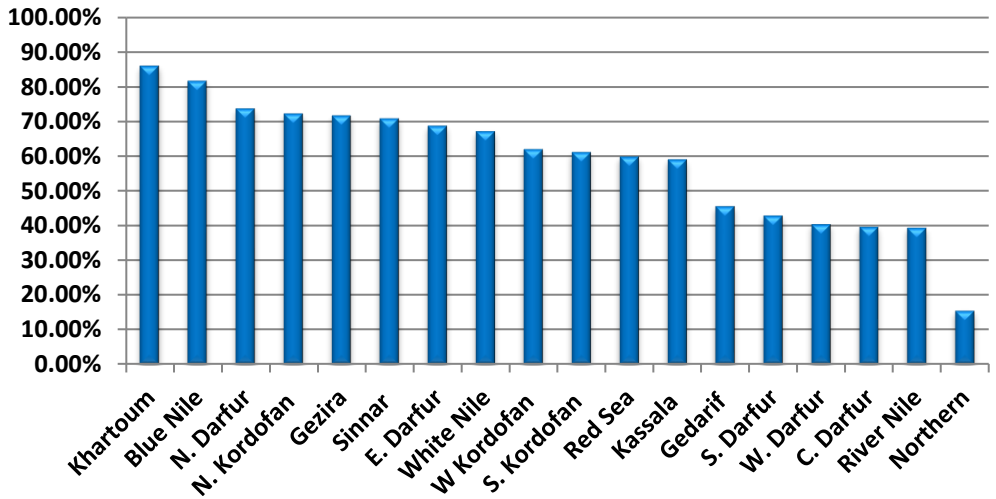
- Clinical and serological surveillance are routinely activities conducted in some areas in the country;
- Regular sero-surveillance been done on yearly

  bases in the whole country depends on the availability of funds,(may be a risk –based; PDS)
- The data obtained are be used to update the epidemiological situation of the disease

progress made in the surveillance and control



Sero -prevalence 2015 - 2016



Progress made along Stage 1 - Component 1

Active Surveillance in 2015-2017

Results of the surveillance

- **Total number of samples = 8120**
- **Total number +ve = 4486**
- **Sero- prevalence = 58.72**

Active Surveillance in December 2021

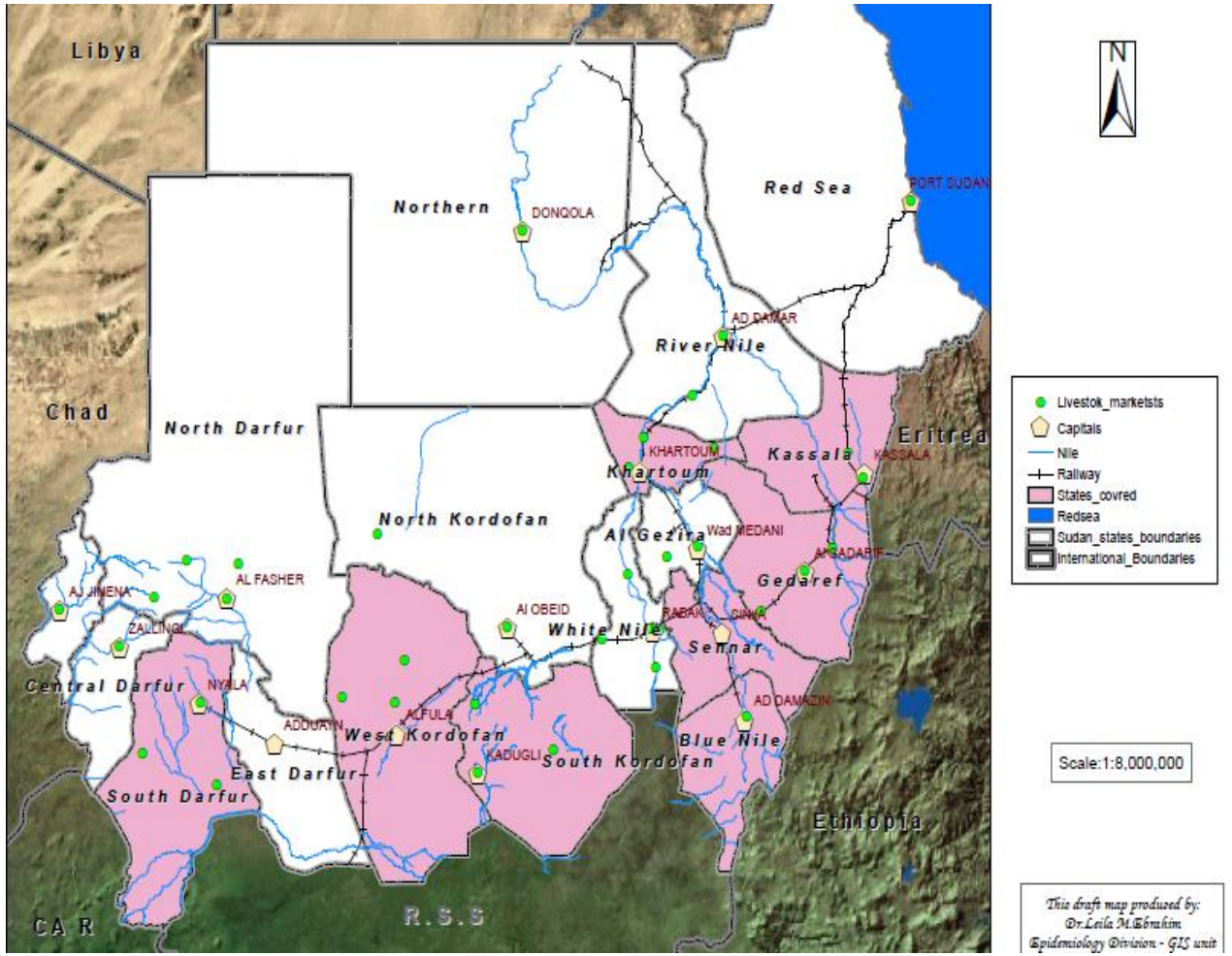
- **Targeted-serveillance conducted targeting shoats at the area surrounding six primary quarantines .**
- **Sero-prevalence= 5.49% (n= 3012) indicating limited role for shoats in transmission and spread of FMD in Sudan.**
- **36 samples collected in 2020, 2021 and 2022 were prepared by the CVRL for submission to WRL in last April.**

progress made in the surveillance and control

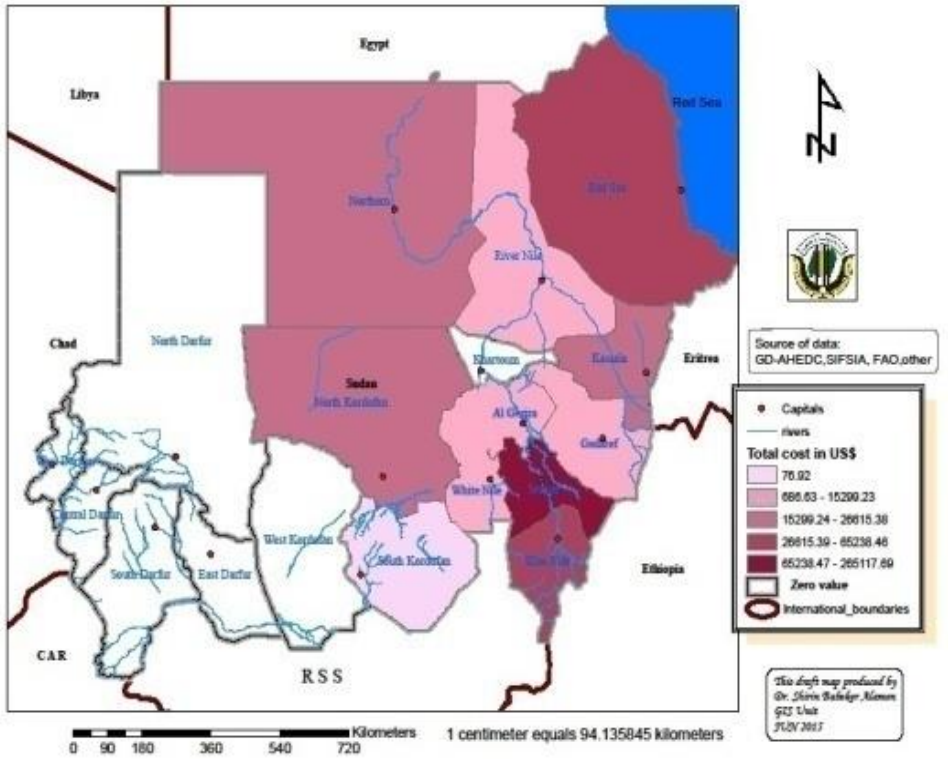
Progress made along Stage 1 - Component 1

Identification of risk hot spots

- **Blue Nile state** bordering RSS and Ethiopia For mainly serotype **O** and **SAT2**
- **Eastern** border namely from East North down to east South: Kassala, Gedarif & sennar states (serotype A)
- Almuwailih **Livestock market** (KHT)



progress made in the surveillance and control



11 States	Direct losses	Costs of control	Total SDG	Total Cost in US$	% of Cost Unit
Total	310,4267.5	28,889	3,133,157	482,024.15	100.00

Progress made along Stage 1 – Component 1

Socio-economic impact

- A socio –economic study was conducted in 2012 for both FMD & PPR
- The total impact of the disease estimated with SDG 3.0 milliard (US$ 482 thousands) annually in eleven states.
- 99% of the impact recorded in the 11 states of the country was due to direct losses (milk, abortion and deaths among young animal) whereas, 1% of the impact in the same study area was due to the cost of control and treatment for secondary infections because there was no vaccination against the disease during the study period.
- there was no estimates in these calculations in terms of:
  - the costs of diagnostics and surveillance required to prevent and control of FMD,
  - the losses due to trade restrictions which are large at both local and international levels
- Therefore US$ 482 thousands are likely to be a very conservative estimate of the national FMD annual impacts (eleven states in the study area).

progress made in the surveillance and control

Progress made along Stage 1 - Component 1

Control measures implemented

Vaccination,

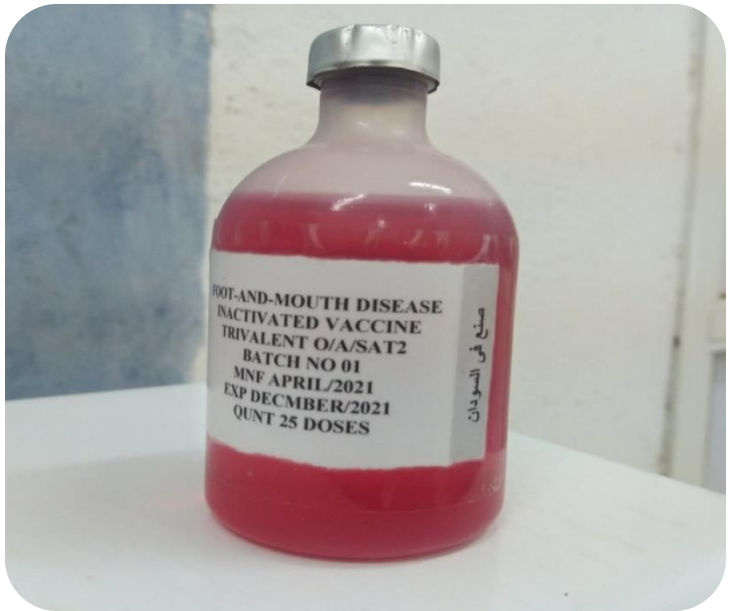
- the vaccine used is: Purified Oil Based Inactivated Foot and Mouth Disease Vaccine "FOTIFAX™"

Kenya Veterinary Vaccine Production Institute

Vaccine Name	FOTIFAX™
Composition "Strains"	O, A & SAT2
species	Cattle, sheep , goats & pigs
Dosage & administration	Cattle 3 ml >3M Sheep, goats & pigs 2 ml
STORAGE	$2^{O}C – 8^{O}C$
Preservation	15, 30, 80 dose vials

Vaccination mainly practiced in large scale dairy farms in Khartoum state and other states where high potential for dairy production is present.

- A 6 months vaccination campaigns were conducted from (2015-2019).
- No vaccination program was conducted between 2020- 2021, except for exportation purpose.
- **Local vaccine (Apthovacc) was developed from three serotypes ciruclating in the country type O, A and SAT2.**
- **Adjuvated with Aluminum hydroxide**



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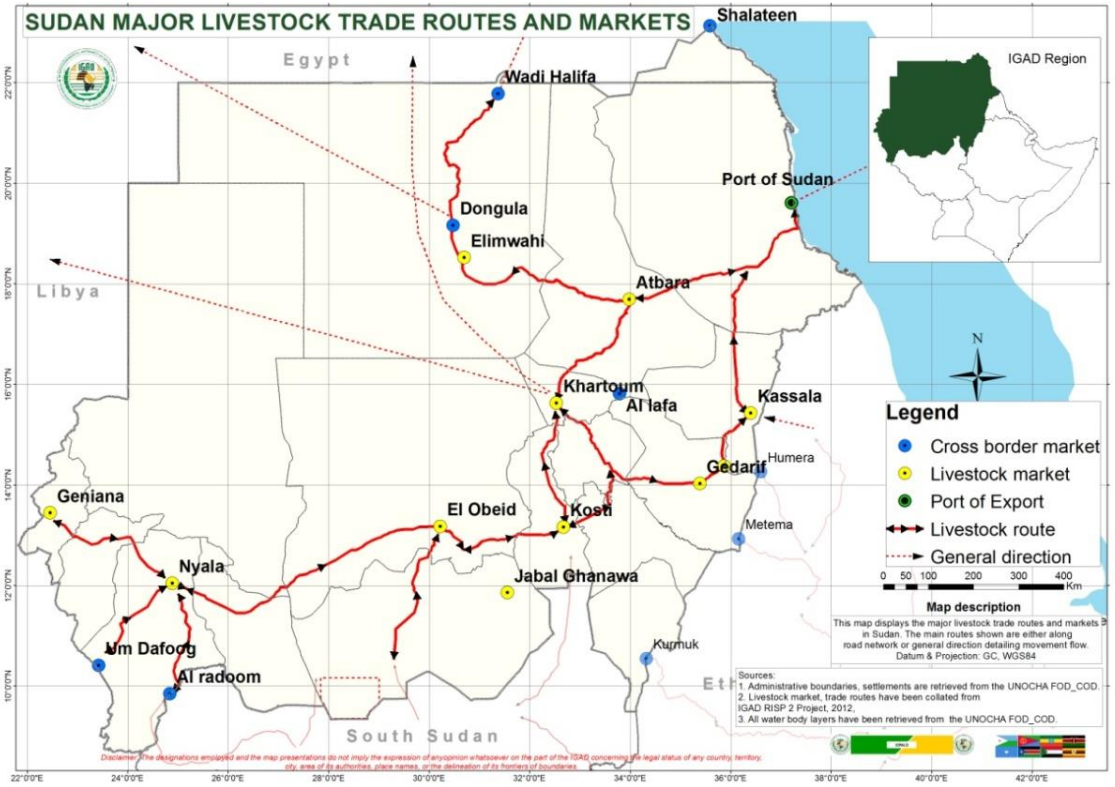


Control measures implemented,

- **Movement Monitoring and controls,**
  - Check points are in place at border and interstates
  - Motorbikes one day missions are routine activities for monitoring cross borders movement (LESP states).
- **Bio-security,**
  Guides for bio-security implementation are in place.
- **Awareness campaigns:**
  - Awareness is a routine activity joint to all field missions on:
    - disease recognition & notification,
    - importance of vaccination & implementation of bio-security measures (TV and Radio programes, booklets & leaflets , posters),
  - Awareness meetings were held in March 2019 targeting different stakeholders in Zone A states.

progress made in the surveillance and control

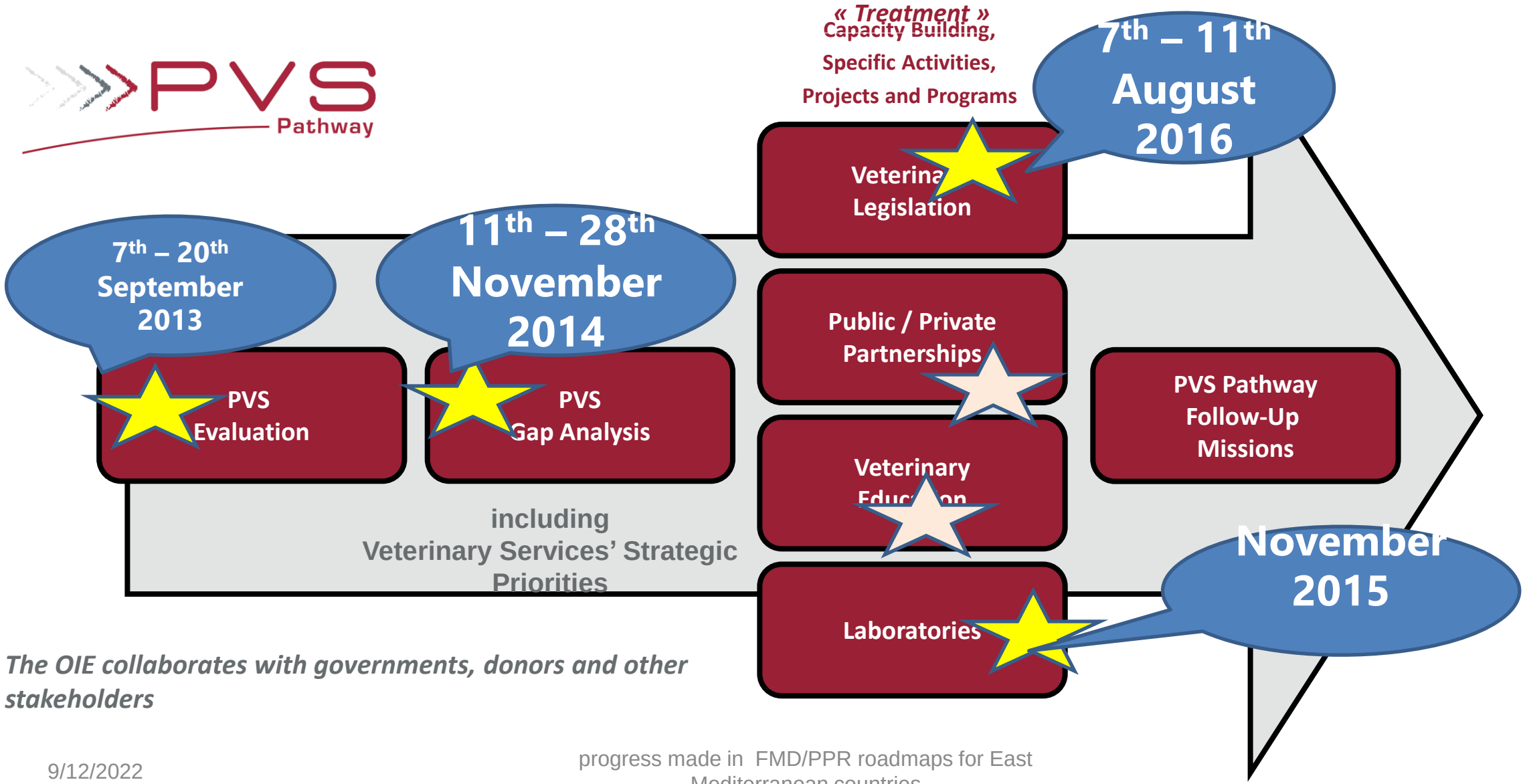
Progress made along Stage 1 - Component 2

Activities to strengthen the veterinary services

Include a description of compliance with the OIE PVS Critical competencies (could be the format of a table or graph) – Indicate the date of the PVS mission

Critical competencies relevant to PCP-FMD Stage 1	Score required	Current score (OIE evaluation or self-evaluation)	Comments (if any)
I.2.A. Professional competencies of veterinarians	3	3	
I.3. Continuing education	3	2	
I.6.B. External coordination	3	3	
II.3 Risk analysis	3	2	
III.1 Communications	4	3	
III.2 Consultation with stakeholders	3	3	
IV.1 Preparation of legislation and regulations	3	2	

progress made in the surveillance and control



The OIE collaborates with governments, donors and other stakeholders

Progress made along Stage 1 - Component 3

Synergies to control other TADs

- **FMD-related activities that contribute to control other major TADs:**

  joint surveillance with CBPP, brucellosis and a planned programme to test them against TB.

- **Strengthening veterinary services contribution to the control of other major diseases:**
  - **Well structured LPH facilitating collaboration and maximize synergies among stakeholders addressing Animal Health issues;**
  - **adequate governance of Veterinary Services at state levels in accordance with OIE standards through capacity building programmes and alliances between the public and private sectors including farmers and private veterinarians (3Ps) (Reinforced the links between the state and the federal governance);**
  - **5 priority TADs control strategies enhanced through coordination and harmonization of surveillance and laboratory testing procedures**
  - **A 5 year programme to reform the gaps in VS is in place (LESP-SLSP & 3Ps project).**

Progress made along Stage 2 - Component 1
Implementation of risk-based control measures

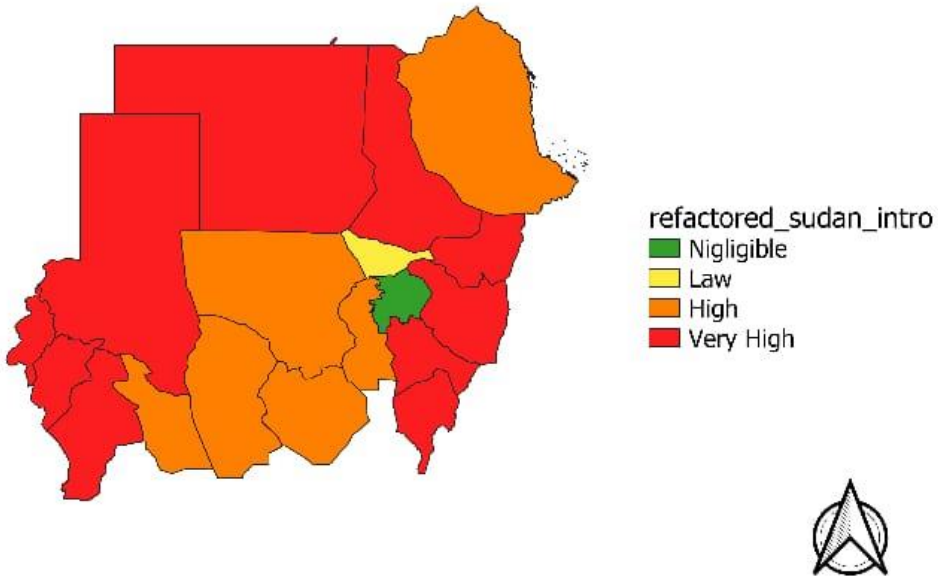
- The Main strategic objective of the RBSP is to:
  - Achieve Country PCP-FMD stage 3 in 2021(not achieved)
  - Finalize RBCS by December 2018 (was developed and submitted at the end of 2018 and re-submitted for evaluation in July 2022)
  - Description of vaccination plans implemented Maps, tables, species, coverage, locations and vaccine(s) used.
  - Detail on other control measures (movement controls, biosecurity, awareness campaigns**....)**

	Validated Stages					Provisional Stages (not validated)						
Country	2012	2013	2014	2015 to 2017	2018	2019	2020	2021	2022	2023	2024	2025
Sudan	1	2	2*	2*	2*	2	3	3	3	4	4	OIE

Source: 3rd FMD road map meeting for East Africa Regional, July 2018, Entebbe, Uganda.

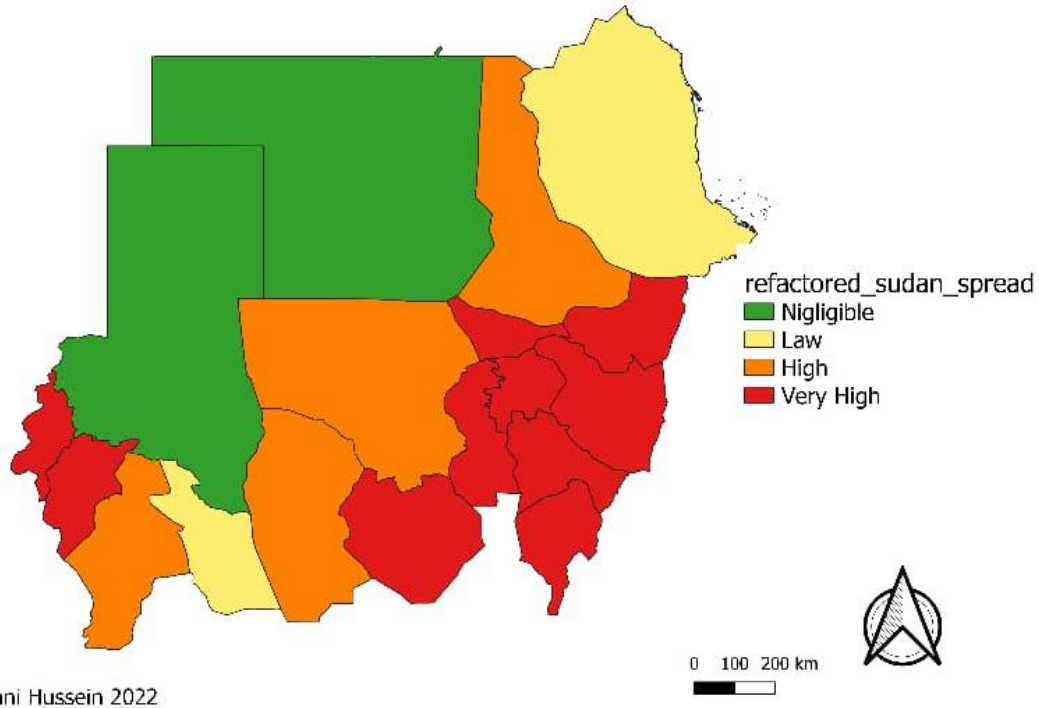
Risk mapping

Sudan Risk of Introduction of FMD 2022



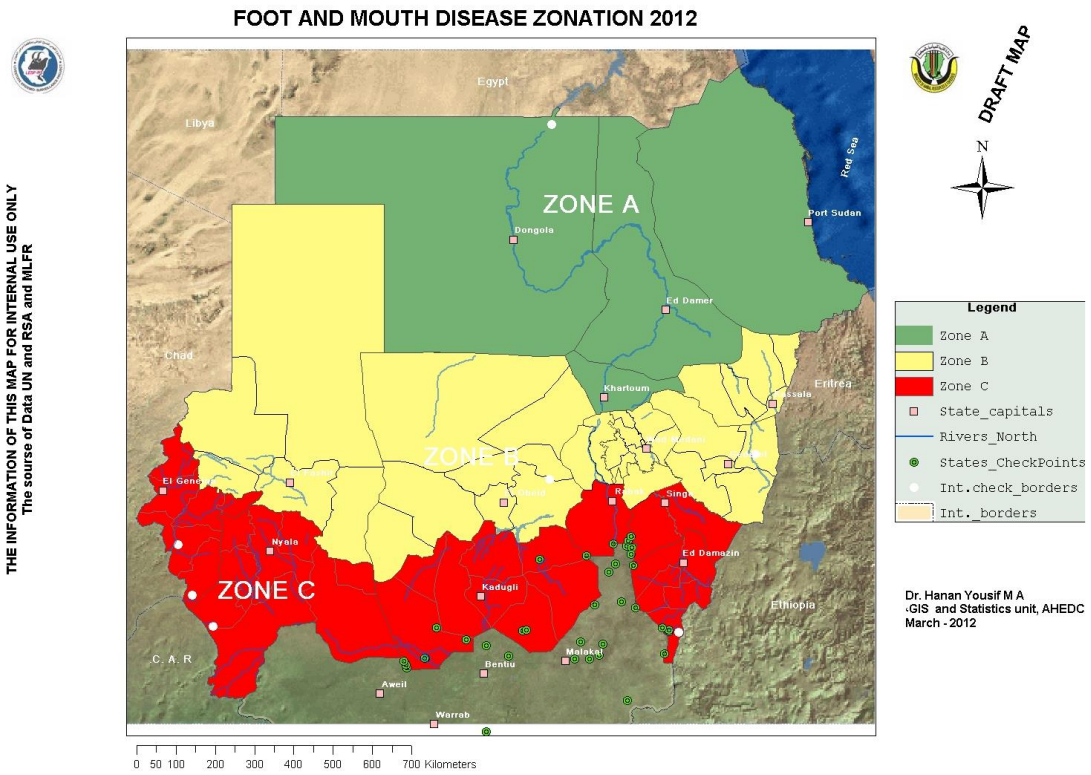
Source: Amani Hussein 2022

Sudan Risk of Spread of FMD 2022



Source: Amani Hussein 2022

progress made in the surveillance and control



Control measures implemented

1. Vaccination:

Species targeted are mainly:

- Dairy cattle in 4 states in the most northern part of the country namely: Red Sea, River Nile, Northern and Khartoum states (in Green)
- Dairy cattle in neighboring parts to zone A “yellow”
- Strategic vaccination for cattle Exports upon request from importing countries

Vaccination Strategy:

- Zone A “Green” vaccination coverage should be 75%
- Zone B “Yellow” vaccination coverage should be 50%
- Zone C “Red” vaccination coverage should be 25%
- cattle below 2 yrs of age twice a year,
- above 2 yrs once a year
- For Naïve animal booster dose administered 3 weeks a part from first dose

2. Animal movement Monitoring and control

Progress made along Stage 2 - Component 2

Activities to strengthen the veterinary services

Include a description of compliance with the OIE PVS Critical competencies (could be the format of a table or graph) – Indicate the PVS

Critical competencies relevant to PCP-FMD Stage 1	Score required	Current score (OIE evaluation or self-evaluation)	Comments (if any)
I.2.B. Competencies of veterinary para-professionals	3	2	
III.3 Official representation	3	3	
III.6 Participation of producers and stakeholders in joint programs	3	3	
IV.2 Implementation of legislation & stakeholder compliance	3	2	
II.5.A. Passive epidemiological surveillance	3	2	
II.1 Veterinary laboratory diagnosis	3	2	
II.2. Laboratory quality assurance	3	1	
IV.6 Transparency	3	3	
I.1.A. Veterinarians and other professionals	3	2	
I.1.B. Veterinary para-professionals and other technical staff	3	2	

Challenges faced in the design and implementation of the country's risk-based strategic plan and Possible solutions and assistance/support needed

The main Challenges that need to be addressed

- Value chain analysis study
- RBCS to be completed by the end of 2018, validated and endorsed.
- Expand the vaccination coverage in zone A.
- Design a sero-monitoring programme in zone A.
- Risk analysis
- Bio-safety and lab managements

Possible solutions and assistance/support needed

- Risk analysis and value chain analysis
- Survey data management and analysis
- Establishing Lab. Quality assurance
- Risk Mapping
- Training on:
  - diagnostic
  - Survey design
  - M & E

technical assistant in:

- Zoning & Compartmentalization
- LITS, developing Database

Research on:

- Update on socioeconomic impact.
- Value chain analysis.
- Role & small ruminants in the Epidemiology of the disease.
- Role of wildlife in the Epidemiology of the disease.
- Small scale immunogenicity study.

Thank you for listening

to my presentation.

I hope you enjoyed it!