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The Pan African Strategy for Control and Eradication of Peste des Petits Ruminants



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TABLE OF CONTENTS

	ACRONYMS	**vi**
	FOREWORD	**vii**
	EXECUTIVE SUMMARY	**ix**
1.	**INTRODUCTION AND BACKGROUND**	**1**
1.1	Introduction	1
1.2	Background	1
2.	**RATIONALE FOR PPR CONTROL AND ERADICATION**	**3**
2.1	Role of Small Ruminants	3
2.2	Impact of Peste des Petits Ruminants	5
2.3	Factors that Favour the Eradication of PPR	8
2.4	Challenges and Gaps	9
2.5	The Strategic Approach	10
3.	**PPR STRATEGIC CONTROL AND ERADICATION FRAMEWORK**	**11**
3.1	Guiding Principles	11
3.2	Results Framework	14
3.3	Tools	17
3.4	The Progressive Approach to PPR Control and Eradication	28
3.5	Control of other Small Ruminant Diseases	33
3.6	Strengthening of Veterinary Services	33
4.	**RESOURCE MOBILIZATION**	**35**
4.1	Cost of the strategy	36
5.	**REFERENCES**	**37**
6.	**ANNEXES**	**39**

ACRONYMS

ARIS	Animal Resource Information System
AU-IBAR	African Union - Inter-African Bureau for Animal Resource
AU-PANVAC	African Union - Pan African Veterinary Vaccine Centre
AU-PATTEC	African Union - Panafrican Tsetse and Trypanosomiasis Eradication Campaign
CCPP	Contagious Caprine Pleuro-Pneumonia
ECTAD	Emergency Centre for Trans-boundary Animal Diseases
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FMD	Foot and Mouth Disease
GDP	Gross Domestic Product
GHoA	Greater Horn of Africa
GF-TADs	Global Framework for the Progressive Control of TADs
IAEA	International Atomic Energy Agency
IGAD	Inter-Governmental Authority on Development
ILRI	International Livestock Research Institute
LPI	Livestock Policy Initiative
MS	Member States
NARS	National Diagnostic Laboratories and National Agricultural Research Services
NGOs	Non-governmental Organizations
OIE	World Organisation for Animal Health
PPPs	Public Private Partnerships (PPPs)
PPR	Peste des Petits Ruminants
PVS	Performance of Veterinary Services
RC	Reference Centre
RL	Reference Laboratory
RP	Rinderpest
RVF	Rift Valley Fever
SGP	Sheep and Goat Pox
SMP-AH	Standard Methods and Procedures – Animal Health
SOPs	Standard Operating Procedures
SRDs	Small Ruminant Diseases
WAHID	World Animal Health Information Database
WAHIS	World Animal Health Information System

FOREWORD

Everyday around the world, consumers enjoy one or more of Africa's vast range of products derived from sheep and goats. These include milk, meat and leather products that are all natural and of high quality and value.

The rearing of small ruminants is at the heart of the way of life of many agro-pastoralists in Africa which is home to about 24.3% and 32.7% of the world's sheep and goats, respectively. As a result, Africa produces approximately 16.6% and 25.4% of the total global sheep and goat meat, 20.9% and 22.5% of the total global sheep and goat milk and 8.9% and 19.3% of the total global sheep and goat fresh skins (7). However, these production levels are below those required for Africa to be self-sufficient in sheep and goat products. This situation is likely to deteriorate if Peste des Petits Ruminants (PPR), a highly contagious viral disease affecting small ruminants, is left unchecked, given its aggressive and startling spread across the continent since 2006.

The economic impact of PPR outbreaks, including production losses and disease control costs for Africa is estimated to be USD 147 million per year (13). Past efforts to control the disease were disjointed and did not yield the much needed traction to contain the spread of PPR. This will not be realized by chance. In the wake of this realization, the African Union Commission, through the African Union Inter-african Bureau for Animal Resources (AU-IBAR) and the African Union Pan-African Vaccine Centre (AU-PANVAC), has coordinated the development of the Pan-African Strategy for the Control and Eradication of PPR. This is a fifteen year blueprint for Africa that is designed to build on past achievements and experiences, harness the available human and institutional resources and capacities, mobilize the financial resources and galvanize the necessary partnerships and political support to focus on the control and eradication of PPR.

The strategy has been informed by scientific evidence, various consultative processes amongst key national, regional and continental stakeholders and collective years of experience in the control of epidemic diseases, particularly the eradication of rinderpest. It is aligned to the Global Strategy for the Control and Eradication of PPR that was jointly launched by the Food and Agriculture Organization (FAO) of the United Nations and the World Animal Health Organization (OIE) in April 2015.

This Strategy presents a resolute and inspired value proposition, predicated on the containment, control and eventual eradication of PPR while assuring collateral gains in the control of other small ruminant diseases and the strengthening of veterinary services

in Africa. The ultimate intention is to achieve a PPR free Africa status.

As we roll out this strategy, AU-IBAR and AU-PANVAC will remain alive to the shared values created from the moment the young lamb or kid is born, to the moment an empty glass of milk or plate of mutton is set down on the table.

This will be an exciting journey of challenges, opportunities and achievements and we invite all stakeholders to share it with us.

H.E. Rhodha Peace Tumusiime,
Commissioner for Rural Economy and Agriculture,
African Union Commission

EXECUTIVE SUMMARY

This Pan African Strategy for the Control and Eradication of Peste des Petits Ruminants (PPR) is a revised and updated version of the Pan-African Strategy for the Progressive Control of PPR that was prepared in the second half of 2010 following the recommendation of the 8th Conference of the Ministers responsible for Animal Resources in Africa held in Entebbe, Uganda in May 2010. The revision of the strategy has been necessitated by the need to align it to the Global strategy for the Control and Eradication of PPR, jointly prepared by the Food and Agriculture Organisation (FAO) of the United Nations and the World Animal Health Organisation (OIE) and launched in April 2015 following endorsement by stakeholders during a global PPR conference held in Abidjan, Cote d'Ivoire from 31st March to 2nd April 2015.

The important role of small ruminants in the social economy of pastoralists and other communities in Africa, as well as the negative impacts of PPR on the livelihoods and economies of African Countries, are the major justifications for this strategy.

The strategy is made up of three components: (i) the progressive control and eradication of PPR, (ii) the control of other national/regional priority small ruminants' diseases (SRDs) for the overall improvement of the health and productivity of small ruminants and (iii) the strengthening of veterinary services in Africa to accelerate the achievement of the first two components. For the first component, the strategy espouses among others: (a) a risk-based approach in order to gain a better understanding of the epidemiology and drivers of the disease. This will guide the sequential application of interventions targeting firstly, "virus hot spots" that are sources of virus dissemination in order to reduce disease incidence, followed by other targeted interventions for disease eradication; (b) an adaptive management approach that maximizes the uptake of lessons learnt during the implementation; (c) regional approaches, with harmonisation of control measures, policies and legal frameworks and exchange of information; (d) effective partnerships and alliances that leverage the expertise and other resources needed to attain the objectives of the strategy; and (e) effective and sustainable programmes for animal health services delivery.

The overall objective of the strategy is to contribute to food security, poverty alleviation and the resilience of livestock-dependent communities in Africa and economic growth of the affected countries. Specifically, the strategy will improve the health and production of small ruminants in Africa. The strategy has three main outputs, namely: (i) PPR eradicated from Africa by 2030; (ii) other SRDs controlled and (iii) veterinary services strengthened.

The actions needed to achieve the objectives of the strategy are presented as tools and include among others: epidemiological surveillance; laboratory diagnostics; vaccine, vaccination and vaccine delivery systems; post-vaccination evaluation; communication and awareness; capacity development and utilisation; research and technology; coordination; and OIE Standards with the Performance of Veterinary services (PVS) pathway.

A phased approach with well-coordinated and harmonised activities across all regions and countries is adopted given that PPR is endemic in most of the affected countries on the continent. This phasing is based on four different stages which correspond to a combination of decreasing levels of epidemiological risk and increasing levels of prevention and control. These are:

Stage 1 (epidemiologic and socio-economic impact assessment) - the objective at this stage is to gain a better understanding of the PPR epidemiological situation within the local socio economic context (presence or possibly the absence) of PPR in the country, its distribution among the different farming systems and, ultimately, its impact on these systems (in addition to the epidemiology study, stage 1 will be used for the preparation of activities for the next stage of the programme);

Stage 2 (control) - the aim at this stage is to target vaccination, in particular mass vaccination, in “hotspot areas” and potential sources of virus dissemination so as to break the maintenance and spread of PPR virus in different epidemiological situations, geographical areas or production systems;

Stage 3 (Eradication) - the actions here aim to eradicate the virus from the national flock;

Stage 4 (Verification of absence) - when the country can provide evidence that there is no virus circulation either at zonal or national level, and is ready to apply for the OIE official country status of PPR freedom.

The OIE Performance of Veterinary Services (PVS) Pathway will be a major tool for structuring and planning the activities and for assessing progress in the strengthening of veterinary services. Thus, countries progressing along the stages will have to simultaneously develop their veterinary services to be able to fulfill the criteria for attaining freedom from PPR. The strategy recognizes that the approach and the activities proposed under “Strengthening Veterinary Services” are not PPR-specific and therefore are expected to have spill-over effects on the control of other major transboundary

animal diseases (TADs).

The tools to be used for implementing PPR eradication will also contribute to the control of other SRDs. Achieving progress in PPR eradication (i.e. reaching higher stages) and controlling other SRDs will not be possible without having created an appropriate enabling environment for disease control, i.e. having improved the capacities and capabilities of the veterinary services with policies, legislation, equipment and trained personnel.

Resource mobilisation is presented as a shared responsibility between the Pan-African, regional and national levels. However, the responsibility of implementing the interventions in the different countries directly remains with the respective Governments. The regional levels will have the responsibility of directly coordinating and providing support for cross-border actions to the countries, while the responsibilities of the continental level will be overall coordination of implementation, coordination of regional actions, support for capacity building at national and regional levels and resource mobilisation at the three levels.

1. INTRODUCTION AND BACKGROUND

1.1 Introduction

Peste des Petits Ruminants (PPR), or small ruminant plague, is a highly infectious and devastating disease of goats and sheep. When a fully susceptible flock is infected, morbidity and mortality rates can be very high. The disease has significant impact on livelihoods, in particular the livelihoods of small holders (4). This document, the Pan African Strategy for the Control and Eradication of Peste des Petits Ruminants (PPR) (hereinafter, the Pan African PPR Strategy 2015) describes a framework for the control and eradication of PPR in Africa by 2030. It also describes the improvement of veterinary services as a synergistic and complementary action to the control and eradication of PPR, while providing countries with the option to control other priority small ruminant diseases (SRDs).

This strategy is aligned to the Global strategy for the Control and Eradication of PPR (10) and is, at the same time consistent with: the Global Framework for Trans-boundary Animal Diseases (GF-TADs) 5 Year Action Plan for 2013 -2017 (9); The Comprehensive African Agriculture Development Programme (CAADP) (27); Livestock Development Strategy for Africa (LiDeSA) (15); and The African Union Pastoral Policy Framework (26).

1.2 Background

The preparation of the Pan-African PPR Strategy was carried out through a consultative and iterative process that started as a follow up to the recommendation of the 8th Conference of the Ministers responsible for Animal Resources in Africa held in Entebbe, Uganda in May 2010. The Ministerial Conference recommended that AU-IBAR mobilizes resources for the progressive control of Peste des Petits Ruminants (PPR) and other priority trans-boundary animal diseases (TADs). Subsequently, AU-IBAR in collaboration with the International Livestock Research Institute (ILRI) coordinated the development of the Pan-African Strategy for the Progressive Control of PPR in 2010 (Pan African PPR Strategy 2010) (3). In order to operationalize the strategy, AU-IBAR and AU-PANVAC developed the draft Programme for the Progressive Control of PPR and other Small Ruminant Diseases in Africa in 2012 (24). The programme was subsequently endorsed by the 9th Conference of Ministers responsible for animal resources in Africa, held in Abidjan, Côte d'Ivoire in April, 2013. The conference also recommended the mobilization of the necessary resources to implement the strategy under the coordination of AU-IBAR and AU-PANVAC with the support of OIE, FAO and the International atomic Energy Agency (IAEA) among other partners. Both the strategy and the programme recognized the need to align the African initiatives with a Global strategy once the latter was developed.

The Global strategy for the Control and Eradication of PPR (10) (hereinafter, the Global PPR Strategy), jointly prepared by FAO and OIE, was launched in April 2015 following endorsement by stakeholders during an international conference held in Abidjan, Cote d'Ivoire from 31st March to 2nd April 2015. This strategy has also been enriched with material from The IGAD Regional Peste des Petits Ruminants Progressive Control and Eradication Strategy (hereinafter, the IGAD Regional PPR Strategy) (28).

The revision and alignment process took into consideration the need to conform to a structure that explains the rationale for the strategy, outlines the guiding policies and principles for dealing with the challenges, sets clear goals and objectives and actions to achieve the goals, and outlines the measures for mobilising the resources needed to execute the actions. The section on the role of small ruminants and the socio-economic significance of PPR borrows from the IGAD Regional Strategy but with further updates from published information. The factors that favour the eradication of PPR have been upheld, while the section on challenges and gaps integrates those in the Pan African PPR Strategy 2010 and the Global PPR Strategy. The guiding principles that were a key point of strength in the Pan African PPR Strategy 2010 have been unpacked and repackaged. The section on the strategic approach has been aligned to the Global PPR Strategy, while the results framework section uses the concept of theory of change to link low level outcomes to intermediate and ultimately the higher level development objectives. The actions/tools for achieving the objectives of the strategy (epidemiological surveillance; laboratory diagnostics; vaccines, vaccination and vaccine delivery systems; coordination; communication and awareness; sero-monitoring; and emergency preparedness and contingency planning) have been aligned with the Global PPR Strategy. The OIE Standards with the Performance of Veterinary Services (PVS), social surveys and flock immunity assessments as approaches to evaluating the effectiveness of vaccination are new and have been reproduced from the Global PPR Strategy. The section on research and technology is upheld, while two sections: Capacity Development and Utilisation and Livestock Identification and Traceability are new. The section on Standard Methods and Procedures is derived from the IGAD Regional PPR Strategy. The phased approach as elaborated in the Pan African Programme for the Progressive Control of PPR has been enriched with illustrations from the Global PPR Strategy.

2. RATIONALE FOR PPR CONTROL AND ERADICATION

2.1 Role of Small Ruminants

Sheep and goats provide a vast range of products and services. For the producers, they are a source of milk, meat and meat products, skins and wool throughout the year. They are cheaper to buy compared to larger animals, they reproduce rapidly and are easier to sell to meet immediate household needs or to exchange for other staple foods. In agro-pastoral systems, they are an important source of manure for soil fertility. In addition to this, they are well adapted to pastoralist and agro-pastoralist ecological systems common in all the regions of Africa. Due to this, women and disadvantaged households often rely on them for household nutrition and other needs. They are an important means for rebuilding herds after environmental and political shocks. Thus, small ruminants are an important component of pastoral coping mechanisms (5). For other value chain actors including traders, transporters, slaughter-house operators, butchers, supermarkets and other meat retailers, sheep and goats are an important source of livelihoods through the provision of employment and income. Consumers too stand to gain if they are able to sustainably access high quality meat and other small ruminant products.

Africa is home to about 24.3% and 32.7% of the world's sheep and goats, respectively. These animals make significant contributions to national economies in Africa and their importance may vary from one region/country to another (see table 1 and 2). In the IGAD region for example, small ruminants contribute more than 80% of the livestock exports (8). The share of livestock in the overall GDP (%) is estimated at 3.1% in Djibouti; 9.7% in Eritrea; 17% in Ethiopia; 10.4% in Kenya; 23% in Sudan and 8.1% in Uganda (31). Africa produces approximately 16.6% and 25.4% of the total global sheep and goat meat, 20.9% and 22.5% of the global sheep and goat milk respectively and 8.9% and 19.3% of the global sheep and goat fresh skins respectively (7). However, these production levels

Table 1: *Animal Population in 2013 in Africa. The table below breaks down the livestock population per species in numbers and in Tropical Livestock Units (TLU): 1TLU=1.0 Camels, 0.7 Cattle, 0.1 Sheep & Goats, 0.01 Chicken and 0.2 Pigs*

Livestock species	Numbers(Million)	TLUs(Million)	Population Sizes in %
Cattle	219.5	153.7	58%
Goats	317.2	31.7	12%
Sheep	281.7	28.2	11%
Birds	1135.4	11.4	4%
Pigs	27.5	5.5	2%
Camels	14.5	14.5	5%
Equine	26.5	21.2	8%

Table 2: *LIVESTOCK POPULATION IN AFRICA IN 2013*

SN	COUNTRY	CATTLE	SHEEP	GOATS	SHOATS	BIRDS	SWINE	EQUINE	CAMELS
1	Benin	2111000	842000	1678000	2520000	16941000	398000	1556	0
2	Burkina Faso	8912433	9007564	13485889	22493453	40990790	2299836	1234973	18013
3	Botswana	2556228	173920	755934	929854	0	7957	196259	287
4	Cameroon	5600000	3000000	4000000	7000000	45000000	1500000	0	0
5	Congo DRC	1145222	1284790	4225300	5510090	22316000	981435	0	0
6	Djibouti	40000	400000	600000	1000000	0	0	6800	50000
7	Algeria	1909455	26572980	4910700	31483680	194411814	0	208590	344015
8	Egypt	3002778	2337486	1083518	3421004	24992	0	1059955	66801
9	Ethiopia	53990061	25489204	24060792	49549996	50377142	0	9005430	2245581
10	Ghana	1590000	4156000	5751000	9907000	61565711	638000	2468	0
11	Guinea	4704299	1616747	2174820	3791567	517006	96344	0	0
12	Guinea Bissau	1325413	304745	649083	953828	1482641	343680	4355	0
13	Kenya	17501684	17259360	29715633	46974993	32612620	305036	0	2985153
14	Lesotho	830560	2605710	890358	3496068	3978293	119939	316090	0
15	Morocco	3172984	19956385	6235861	26192246	0	0	1540167	197550
16	Mozambique	1680787	851644	3167511	4019155	0	990292	28027	0
17	Mali	10012966	13735523	19126806	32862329	36850378	77594	517605	978980
18	Malawi	1241714	255928	5356545	5612473	17200	2754414	107	0
19	Mauritius	7302	2211	27430	29641	6000000	15287	900	0
20	Mauritania	1773563	10073138	6714042	16787180	0	0	0	1379417
21	Namibia	2671062	2225708	1848718	4074426	698023	185079	324066	290
22	Nigeria	15316025	57685216	109362672	167047888	224264490	8361713	1286505	92699
23	Sudan	29840000	39483000	30837000	70320000	45500000	0	8312148	4751000
24	Senegal	3313055	5571335	4754845	10326180	39269866	354474	972598	4740
25	Sierra leone	517000	682000	803000	1485000	9460000	17000	0	0

SN	COUNTRY	CATTLE	SHEEP	GOATS	SHOATS	BIRDS	SWINE	EQUINE	CAMELS
26	Swaziland	627486	16286	458516	474802	1833717	38861	11691	20
27	Chad	6879722	2886282	6287562	9173844	48000000	74319	883799	1374307
28	Togo	428772	1111977	2526059	3638036	15344011	944979	0	0
29	Tunisia	646157	6855520	1274460	8129980	97172000	2000	187805	80000
30	South Africa	13919931	20331685	6138146	26469831	50792224	1585955	0	0
31	Uganda	12896041	3721028	13910274	17631302	41725658	3928218	0	0
32	Zambia	3995142	697352	1386420	2083772	28114625	1207248	0	0
33	Zimbabwe	5368106	513741	2995776	3509517	20161788	310101	426232	0
	TOTALS	**219526948**	**281706465**	**317192670**	**598899135**	**1135421989**	**27537761**	**26528126**	**14568853**

Source: OIE/WAHID

are below those required for Africa to be self-sufficient in sheep and goat products. This situation is likely to deteriorate if Peste des Petits Ruminants (PPR) is left unchecked.

2.2 Impact of Peste des Petits Ruminants

2.2.1 The Disease

The severity of PPR impacts is determined by the complex roles played by small ruminants and the epidemiological status of the disease. Since its first identification in 1942 in Côte d'Ivoire, PPR has over the years expanded its geographical distribution beyond its original endemic region in Western Africa to engulf most of Africa, Central Asia, South Asia and East Asia (11). In Africa, PPR is widespread and has been confirmed as far south as Angola (2012) and the Democratic Republic of Congo (DRC) in 2005; as far east as Kenya (2006), Uganda (2007), Tanzania (2008), and Comoros (2012) and as far north as Morocco (2008), Tunisia (2009) and Algeria (2011) (18, 19, 20, 21, 22, 23 & 32). In North Africa, PPR is currently present in Tunisia, Algeria, Mauritania, and is widespread in Egypt. It is suspected in Libya based on serological surveys but it has not been officially reported (1). Figure 1 shows the status of the disease in Africa.

Morbidity and mortality rates in epizootic outbreaks are often very high. For instance, in Nigeria, mortality rates ranging from 20 to over 90 per cent have frequently been

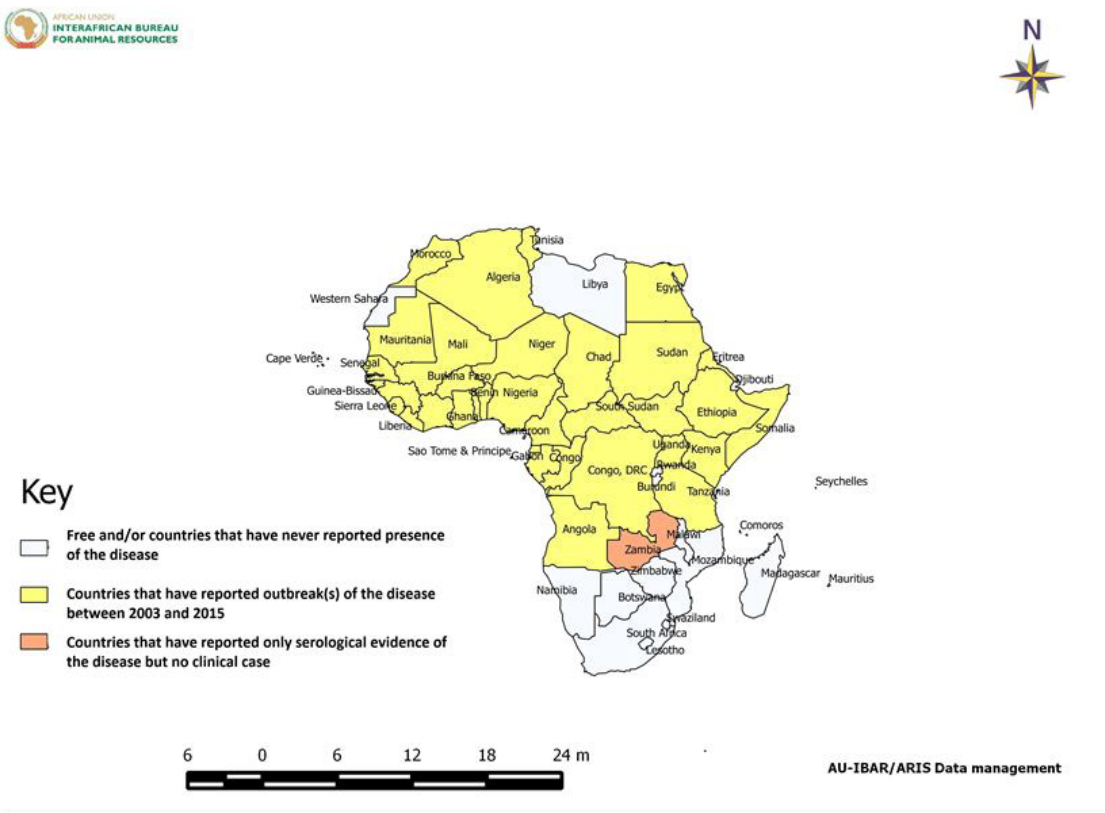


Figure 1: *Status of PPR in Africa*

reported, whilst rates of only 4 to 5 per cent were recorded in what are considered to be true endemic areas (25).

In wildlife, the prevailing scientific consensus is that wildlife species might serve as a sentinel for PPR virus (PPRV) circulation in domestic animals and that the role of animal species other than sheep and goats in the epidemiology of PPR needs further investigation (14).

2.2.2 On-going Control Measures

In Algeria, control is through intensified surveillance in farms and markets and vaccination in affected regions. In Tunisia, no vaccination has been conducted to date, while in Mauritania, where the disease has been endemic since the 1980's, vaccination is applied solely around outbreaks. Morocco succeeded to effectively control PPR through mass vaccinations that were conducted from the end of 2008 to 2011. Following the implementation of intensive surveillance, only one outbreak was reported in June 2015.

In Eastern Africa, most countries are infected and vaccination campaigns are mostly conducted in response to disease outbreaks but wider campaigns have been conducted in Ethiopia, Kenya, Somalia and Sudan. Most countries in Southern Africa are currently free from PPR. South Africa and Swaziland are officially recognised by the OIE as free from PPR on a historical basis while Namibia is officially recognized as PPR free in the zone south of the Veterinary Cordon Fence (12). All countries in Central and West Africa are infected and face multiple constraints in controlling and eradicating PPR, including inadequate political commitment and financial and technical support from the respective RECs and development partners (10).

Since 2007-2008, PPR has been steadily expanding in Africa. The disease has spread northwards to cover all North Africa, and southwards to reach Angola, Tanzania, the Comoros Island and recently Zambia. This trend of expansion clearly indicates that PPR should be considered as a concern not only for currently infected countries but also for the whole of Africa including countries that are not currently at the front line of the disease. The re-emergence of PPR in Morocco in June 2015, after the major control efforts carried out from 2008 to 2011 that succeeded in eliminating the disease for about 4-5 years, reiterates the need for a regional approach to control and eradicate this transboundary disease. The Morocco example proves that efforts made by a single country are quickly jeopardized if similar actions are not undertaken by neighboring countries and in a coordinated manner.

2.2.3 Socio-Economic Impact

The socio-economic losses associated with PPR mainly result from the high case fatality rates. In naïve populations, such as was the case in the 2006–2008 outbreaks in Kenya, morbidity as high as 73% was reported with severe impacts on livelihoods (4). The outbreaks resulted in better-off households slipping into poverty, while the poor and very poor became impoverished. An estimated livestock asset loss due to 2 years of PPR virus circulation ranged from 52 to 68% depending on the wealth categories. The disease caused inter alia shifts in food consumption, food availability, and income sources and in the process affected food security particularly of the poor and marginalized segments of society. The livestock-derived income dropped by 99% for poor and very poor households, by 55% for the middle wealth groups and 42% among the well-off households. Most households were unable to maintain a sustainable flock size and without mitigation measures being implemented, many were expected to drop out from pastoralism, in an environment that supports very little else in terms of livelihoods; resulting in increased long-term dependency on food aid and a drain on the national resources. In Ethiopia, FAO estimated that losses associated with PPR reached an average of USD 375 per flock

per year, for an average flock size of 143 small ruminants (an average loss of more than USD 2 per animal) (5).

In Nigeria, an outbreak that occurred in 1979 killed 10-20% of the national small ruminant flock and losses were estimated at USD 75 million (11). In Mauritania the estimated economic loss associated with PPR in an endemic setting, characterized by high morbidity and low mortality amounted to USD 5 million for a population of 15 million small ruminants, which is around USD 0.333 per head (6). The losses were due to mortalities, abortions and production losses as well as costs incurred as part of control measures. A cost-benefit analysis of PPR control in Mauritania showed high returns on investment. Thus, vaccination of 89% of the stock may reduce the losses by 86% (from USD 5 million to USD 700,000), mostly representing the cost of the vaccine. An economic analysis for assessing the benefits of vaccination against PPR in Niger revealed that the program was highly beneficial (2). The estimated economic impact of current outbreaks in Africa including production losses and disease control costs is more than USD 147 million per year (13)

2.3 Factors that Favour the Eradication of PPR

The etiologic agent of PPR is a member of the Morbillivirus genus and a close relative of the virus responsible for rinderpest (RP), a disease affecting all ruminants but that was particularly severe in cattle and buffaloes. Rinderpest was recently globally eradicated. Among the factors that made this success possible were some features of the disease and also the fact that efficient and practical tools for disease control were available. Indeed there was only one sero-type of the virus. There was no carrier state: infection was short lived and resulted in either death or life-long immunity against all strains of rinderpest virus in recovered animals. This characteristic also applied to the live attenuated vaccines against the disease. The virus did not survive for long outside the animal host: it was readily destroyed by heat, sunlight, chemicals and disinfectants. Thus, the virus needed a continuous source of new susceptible animals to survive. Proven diagnostic tests were available. PPR virus (PPRV) shares all these characteristics with rinderpest virus.

Although molecular-based techniques have allowed the grouping of PPRV strains into 4 genotypes, all being prevalent in Africa, there is only one PPRV serotype. Because of this characteristic, one vaccine provides protection in sheep and goats against all virulent PPRV strains as proved by widespread field use of the attenuated PPR vaccine Nigeria 75/1 strain. It has also been proved that the protection provided by PPRV live attenuated vaccines lasts for at least 3-5 years, i.e. the economic life of a sheep or goat in most cases. In addition to the availability of efficient vaccines, there are good and

practical tests, including a penside test, for the rapid and specific diagnosis of PPR and tools for use in disease surveillance and the monitoring of PPR control activities. Thus, the existing technical tools are sufficient to enable the commencement of PPR control and eradication.

At the level of animal health institutions, the rinderpest eradication process created an increased awareness and capacity for coordinated control interventions based on sound epidemiological approaches that are driven by socio-economic incentives. In addition, considerable progress was made to enhance surveillance capacities, regulatory environments as well as private sector and community participation.

2.4 Challenges and Gaps

Whereas from a technical point of view, there are tools for the control and eradication of PPR from Africa, gaps and challenges that could limit effectiveness and efficiency still exist as follows:

2.4.1 Gaps

- Insufficient knowledge on the epidemiology of PPR including its transmissibility (R0) in different population settings and host species;
- Lack of improved tools such as thermo-stable vaccines;
- Limited technical and institutional capacities in (but not limited to) disease recognition, sampling, diagnosis, epidemiology and control;
- Lack of legislative support in some countries.
- Inadequate resources (finance, logistical and manpower, etc.).

2.4.2 Challenges

- Perceptions of low individual economic value of goats/sheep relative to the large ruminants masking the high social value of small ruminants;
- High population and high turnover rates of small Ruminants;
- Highly scattered geographical distribution of small ruminants that could complicate the vaccine delivery process;
- High mobility of small ruminants compared to cattle within a country and between countries;
- The expected higher cost of PPR eradication compared to that of rinderpest;
- Ability to target vaccination in time and space at critical control points to achieve sufficient flock immunity levels to interrupt virus transmission;
- High burden of small ruminant diseases
- Ensuring effective coordination of public-private-partnerships (PPP) in service

delivery including vaccination campaigns.

- Coping with insecurity in some regions of the continent.
- Lack of effective animal identification and traceability systems
- Weak veterinary services in many countries

2.5 The Strategic Approach

The Pan African PPR Strategy is not a 'stand-alone activity', aimed solely at PPR control and eradication, but is a carrier mechanism to simultaneously progress in other fields (10) such as the control of other SRDs. It should therefore be considered as part of the policy for fighting against hunger and poverty. Potential SRD candidates in Africa include sheep and goat pox (SGP), contagious caprine pleuro-pneumonia (CCPP), foot and mouth disease (FMD), Rift Valley fever (RVF), brucellosis and endo and ecto-parasites. The choice and prioritisation of these other diseases whose control has to be combined with PPR eradication for cost-effectiveness will be addressed by each region and country. It will be imperative to strengthen the veterinary services in a sustainable manner in order to progress and achieve PPR eradication and the control of other SRDs. The quality of veterinary services depends on a set of factors, which include fundamental principles of an ethical, organisational, legislative, regulatory and technical nature. Some of them are directly related to good governance of the veterinary services, which is a necessary condition for sustainable economic development as it promotes the effective delivery of services and improves the overall performance of animal health systems.

3. PPR STRATEGIC CONTROL AND ERADICATION FRAMEWORK

3.1 Guiding Principles

3.1.1 Risk-based Approach

In tandem with the progressive approach, a risk-based approach is preferred in order to allow the sequential application of targeted interventions. For that purpose, the first activities should focus on epidemiological analysis to understand the situation of the disease in the country and the identification of endemic zones ("hot spots"), to be targeted for mass/intensive vaccination in order to reduce the circulation of the virus and thereby, to dramatically reduce the incidence of the disease. This will be followed by a second step that will entail targeted vaccinations aimed at eliminating virus circulation to achieve disease eradication (if not achieved in the previous stage). Thus, surveillance and control interventions will be risk-based and epidemiologically targeted to maximise impact and economic efficiency. They will comprise of a series of stages targeting defined geographic areas, ecosystems or farming systems, giving priority to the most affected flocks or those at high risk or constituting important risks for the spread of the disease within and outside the country (e.g. small ruminants exporting countries/zones), while protecting the free areas/ zones/ countries.

3.1.2 Adaptive Management

An adaptive management approach that maximizes the uptake of lessons learnt during the implementation of the strategy will be applied. Knowledge derived from learning and research activities will be used to enhance institutional capacities, technical tools and ability to target interventions. Similarly, the socio-economic context of controlling and eradicating PPR will require up-dating so that interventions are delivered in a manner that allows socio-economic forces to effectively drive the programme to a successful and sustainable outcome. This will entail regular cost-effectiveness analyses of the control programmes to assess their impact, especially for smallholder farmers and the regular review of control/eradication strategies and, if necessary, modify them to ensure optimal performance.

3.1.3 Regional Approach

Experience has shown that regional approaches, with harmonisation of control measures, policies and legal frameworks and transparency of information, are crucial in the control of trans-boundary diseases. Regional roadmaps detailing countries' plans with the regular assessment of progress will be equally important. Effective regional coordination will add value to animal health investments by channelling otherwise divergent cross-border activities towards a focused, coherent and sustainable objective.

3.1.4 Control of other national/regional priority SRDs

Based on the high importance of sheep and goats, "the cattle of the poor", in the livelihoods of small holder farmers in the developing world, the control and eradication of PPR should be considered as one of the means in the fight against poverty and food insecurity. It should be placed in the overall context of improving small ruminants' productivity and therefore should not be a standalone activity. It should thus be combined with other activities aiming at improving the health status of small ruminants, in particular the control of other major diseases relevant to national or regional priorities such as sheep and goat pox (SGP), contagious caprine pleuropneumonia (CCPP), foot and mouth disease (FMD), brucellosis and Rift valley fever (RVF). For RVF, the economic importance is linked not only to the high morbidity and mortality rates, but also to its zoonotic characteristic with impacts on international trade in livestock including export bans such as those imposed by the Middle-Eastern countries on livestock and livestock products from the Horn of Africa during the two successive RVF outbreaks in 1998-1999 and 2000-2002. Prior to those bans, the size of the export market from Somalia to Saudi Arabia and the United Arab Emirates was estimated at around USD 600 million, with Saudi Arabia representing 66% of the total market. The bans led to the collapse of the main Somali livestock market. Losses for the livestock industry were estimated at USD 109 million and USD 326 million, for the first and second bans respectively. The Somali government also directly incurred a loss of USD 45 million from foregone export taxes and docking fees. At the same time, livestock exporters lost a net cumulative profit of USD 330 million, whereas producers estimated their annual losses at over USD 8 million. Hence, the successive RVF-related trade bans negatively impacted on the employment rate, the public treasury revenues, the exchange rate of the national currency and thus, the price of imported goods, inducing a general inflationary pressure and other important socio-economic upheavals (16).

3.1.5 Self Sustaining Mechanisms for Animal Health Services Delivery

Control programmes will only be effective and sustainable if they are based on efficient veterinary services that comply with the quality standards described in Chapters 3.1 (Veterinary Services) and 3.2 (Evaluation of Veterinary Services) of the OIE Terrestrial Animal Health Code (30) and on strong partnerships between stakeholders in both the public and private sectors.

3.1.6 Partnerships

To implement the strategy, effective partnerships and alliances are necessary to leverage the expertise and other resources needed to attain the objectives of the strategy. This will entail the strengthening of partnerships between different institutions and organizations

to mobilize the technical, financial and political support necessary for implementation of the strategy. Different partnerships will be developed based on a strategic analysis of the benefits of the partnerships in the eradication of PPR and the control of other SRDs. Key partners for research and diagnostic services are the OIE and FAO Morbillivirus Reference Centres, the International Livestock research Institute (ILRI), National Agricultural Research Institutions, National Diagnostic Laboratories and the International Atomic Energy Agency (IAEA).

Vaccine production laboratories in Africa are also key partners for the successful implementation of this strategy.

The Pan African PPR Strategy is aligned to the Global Strategy that was jointly developed by OIE and FAO. These two organisations are mandated to lead the global coordination of PPR eradication through the GF-TADs Platform and will therefore be very important partners in providing policy direction and guidance as well as in resource mobilisation. The African Union Commission (AUC) represented by AU-IBAR and AU-PANVAC is mandated to coordinate the development and implementation of the Pan-African PPR Strategy. The two AUC institutions will work with Member States and the Regional economic Communities (RECs) to galvanize and sustain the political support necessary for the successful implementation of the strategy. They will also ensure the harmonisation and coordination of interventions outlined in this strategy between Member States within the different regions and between the different RECs in accordance with their respective mandates from the Heads of State and Government of the African Union. This Strategy is also anchored in the Livestock Development Strategy for Africa (LiDeSA) that was recently developed by stakeholders in the livestock sector on the continent, under the leadership of AU-IBAR in collaboration with AU-PANVAC and AU-PATTEC, and subsequently endorsed for implementation by the Executive Council of the African Union in January 2015. AU-IBAR and PANVAC will ensure the coherence of interventions under this Strategy with the objectives and expected outputs of LiDeSA. The OIE's leadership in establishing standards for participation in trade and achievable pathways to national freedom from disease will play a key role in supporting the implementation of the Strategy. FAO will contribute to knowledge management, information sharing and institutional and human resource capacity strengthening at Continental, Regional and National levels.

Public Private Partnerships (PPPs) will be promoted in order to implement disease specific prevention and control strategies, with clearly defined roles and responsibilities for each partner. Leadership of the animal health system should remain in the hands of

the national public services with, when appropriate, delegation of public tasks to the private sector. Thus, national services are encouraged to work with private practitioners, veterinary associations, community-based organizations/programmes, producers and producer associations, non-governmental organisations (NGOs) as well as all other value chain stakeholders and trading partners to implement the strategy.

3.2 Results Framework

3.2.1 Overall Objective

The overall objective of the Pan-African PPR Strategy is to contribute to food security, poverty alleviation and resilience of livestock-dependent communities in Africa and the economic growth of the affected countries.

3.2.2 Specific Objective

The specific objective is to improve the health and thereby the productivity of small ruminants in Africa

3.2.3 Expected Outputs

The expected outputs are:

- PPR eradicated from Africa
- Other SRDs controlled
- Veterinary services strengthened

3.2.4 Theory of Change

Improvement in animal health and productivity of small ruminants is to be pursued through three pathways, namely: health of small ruminants in the context of PPR; health of small ruminants in the context of other priority diseases; and the delivery of veterinary services. The long-term outcomes of the three pathways are: PPR eradicated by 2030, other SRDs controlled, and veterinary services strengthened. This logical relationship among outcomes is presented in Figure 2, while the results framework is in Figure 3. Indicators for each outcome to assess the performance of the interventions are presented in Table 3.These indicators are to be used in monitoring and evaluation in conjunction with the PPR Monitoring and Assessment Tool of the Global PPR Strategy (Annex 1) and the OIE PVS Evaluation Tool described in section 3.3.9 below.

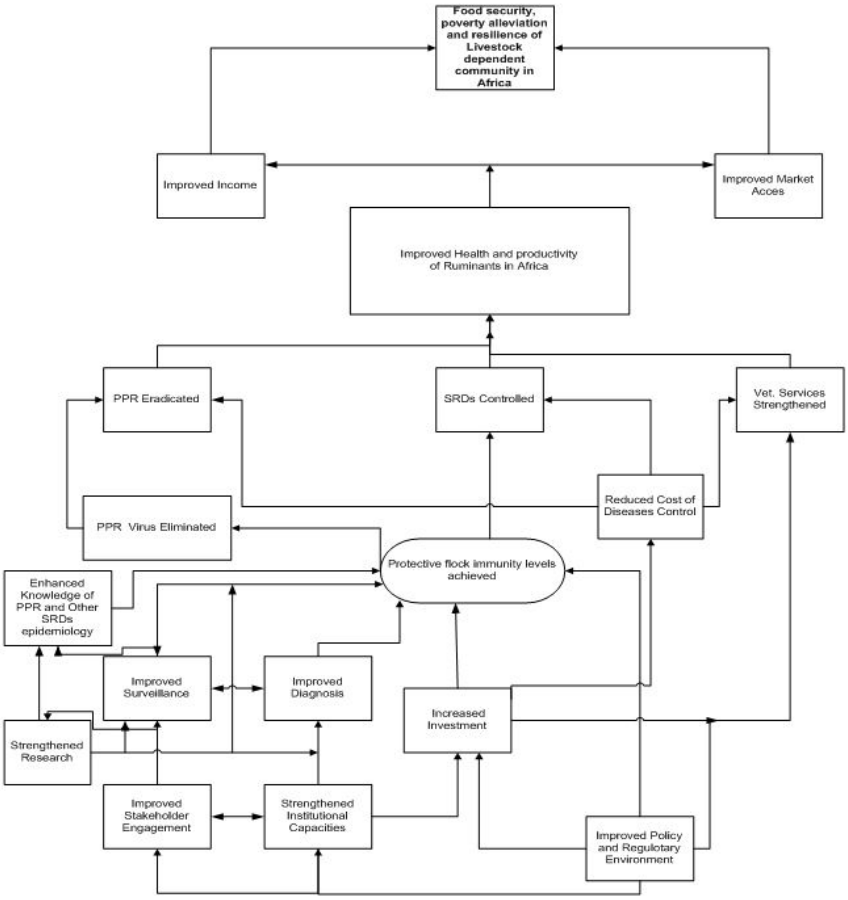


Figure 2: *PPR Strategy: Theory of Change*

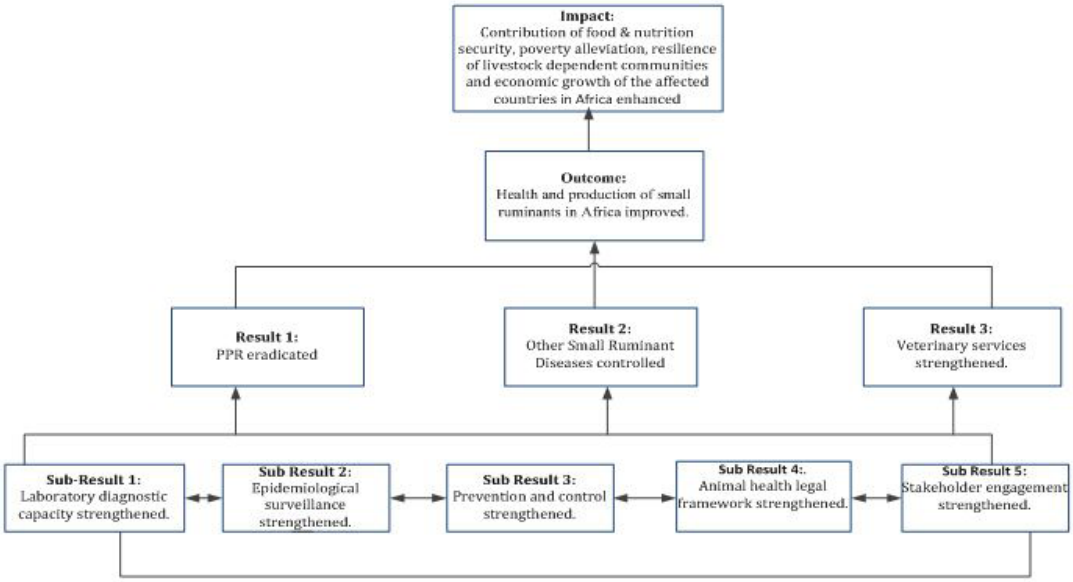


Figure 3: *Results Framework*

Table 3: *Indicators for assessing performance*

Goal: To contribute to food security, poverty alleviation and resilience of livestock dependent communities in Africa and the economic growth of the affected countries.
» Change in poverty gap ratio among livestock dependent communities » Change in contribution of livestock to agricultural GDP » Change in proportion of food insecure populations » Change in the value and volume of climate change-induced livestock losses
Specific objective: To improve the health and production of small ruminants in Africa
» Change in the value and volume attributable to reduced diseases occurrence » Change in number of deployed accredited veterinary personnel » Change in the value and volume of yields [milk, meat] » Change in fertility and fecundity [conception and kidding rates] » Change in the volume and value of small ruminants and their products traded » Change in health costs attributable to diseases » Change in transaction costs
Output 1: PPR eradicated
» Change in number of PPR-free countries having a PPR contingency plan » Change in number of MS certified PPR free » Change in number of MS attaining stage 4 and above as per the Global PPR Strategy timeline
Output 2: Other Small Ruminant Diseases controlled
» Change in disease incidences » Change in disease prevalence
Output 3: Veterinary services strengthened
» Change in levels of PVS competencies » Change in information/knowledge/communication asymmetry in veterinary and other related services » Change in number of deployed accredited veterinary personnel
Sub-Output 1: Laboratory diagnostic capacity strengthened
» Change in proportion of MS using ELISA diagnostic methods » Change in proportion of MS using molecular methods » Change in proportion of MS complying with quality assurance standards » Change in proportion of MS applying differential diagnostic pathways
Sub-Output 2: Epidemiological surveillance strengthened
» Change in accuracy, coverage and timeliness of disease reports » Change in data and knowledge of the epidemiological disease status and risk factors » Change in capacity-induced surveillance practices » Change in lead time response to disease outbreaks » Change in proportion of MS that demonstrate proof of PPRV absence » Change in socio-economic impact trends
Sub-Output 3: Prevention and control strengthened
» Proportion of MS with functional prevention and control structures » Change in protective flock immunity levels in high risk populations » Change in disease incidence in the national population » Change in proportion of MS that have ceased PPR vaccination » Change in proportion of MS that have self-declared PPR freedom » Change in proportion of MS complying with PPRV sequestration guidelines

3.3 Tools

3.3.1 Epidemiological Surveillance

PPR control and eradication will be underpinned by an effective epidemiological surveillance system that provides guidance on priorities and targets for the application of interventions at both national and regional levels. At the national level, the surveillance system should consist of general surveillance activities reinforced by the provisions of Chapter 1.1 on Notification of Disease and Epidemiological Information and Chapter 1.4 on Animal Health Surveillance as well as the PPR specific surveillance guidelines contained in Chapter 14.7 of the OIE Terrestrial Code (30). Strengthening the national epidemiological capabilities and capacity to design appropriate epidemiological studies to promote more extensive use of the epidemiological methods will be necessary. Depending on the epidemiological situation of a country, the objectives can be one or several of the following:

- assessment of the health status of a population, including collection of baseline data
- determination and monitoring of the prevalence, distribution and occurrence of the disease or infection.
- definition of the priority areas for disease control and prevention activities
- provision of information to plan, prioritise and conduct research
- early detection of the appearance of the disease
- demonstration of the absence of PPR clinical disease or infection

Hence the actual surveillance methods used will depend on a country's surveillance objective(s). However, the general starting point is to have a clear understanding of the level and distribution of PPR (and other SRDs) and risk factors in the country. Closely linked with this will be the need to describe all small ruminant husbandry systems, marketing networks and associated socio-economic drivers with a view to developing working hypotheses of transmission pathways. Throughout the various phases, and in addition to active surveillance, passive surveillance will be used to detect and report outbreaks of PPR and other SRDs. This could be complimented with passive syndromic surveillance (based on stomatitis-enteritis in the case of PPR), involving networks of data collectors beyond the veterinary profession. Participatory disease surveillance as an integral component of the surveillance plan will be very useful for disease intelligence gathering and detection of clinical cases in extensive and pastoral husbandry systems to enable targeting of control interventions. In the latter stages/ phases, surveillance activities will focus on provision of evidence of absence of disease or infection as per the OIE Terrestrial Animal Health Code articles 14.7.27 to 14.7.33 (30). Sampling methods and protocols can be found in the annexes of the Global PPR Strategy (10).

A central national epidemiology unit with a strong laboratory, responsible for collecting, analysing and disseminating the information generated through the implementation of field and laboratory activities will be necessary. National surveillance systems will be linked to regional epidemiology networks for information sharing and harmonising national plans at regional level.

Effective, efficient and systematic data collection, collation, storage, analysis and dissemination will be cardinal in the implementation of this strategy. This should provide reliable information for evidence based decision making, advocacy and capacity building. The Animal Resources Information System (ARIS) will be the main tool for this process. In addition to already existing modules on disease data and information within the system, specific modules and sub-modules will be included to cater for the specific needs of PPR surveillance, control and eradication.

3.3.2 Laboratory Diagnostics

As with many diseases, the primary diagnosis of PPR is made by field animal health workers (veterinarians, technicians, etc.). It is therefore critical that the necessary steps are taken to enhance their knowledge and awareness on PPR clinical and pathological signs and differential diagnosis with similar diseases. However, PPR clinical diagnosis should always be considered as provisional until laboratory confirmation is made. Since the mid-1980s, the diagnosis of PPR has constantly been improved through advances in biotechnology, bioinformatics and miniaturisation of electronic devices. Tools are now available for the rapid and specific diagnosis of PPR at different skill levels of the diagnostician and depending on the equipment available in the test laboratories:

- pen-side tests for diagnosis in the field by specialised and non-specialised diagnosticians
- serum-based tests (ELISA) for the detection of antibody or the virus
- PPR virus identification by nucleic acid amplification (RT-PCR)
- virus isolation and genotyping at a well-equipped laboratory or at FAO and OIE reference or collaborating laboratories.

Basic capacities on serological diagnosis are essential in all countries. However, effective and reliable laboratory diagnostics are indispensable at the regional level. It is expected that regional reference laboratories with the capability for virus isolation and genotyping will be identified to provide regional support in PPR diagnosis and training. Networks for standardized diagnostics were a significant contributor to the success of rinderpest eradication and will be replicated for PPR. Thus, networking should promote the use of bench-marked tests and allow data to be compared with confidence across diverse

ecological zones and production systems. This will add value to surveillance data and facilitate risk-based targeting. The existing global network of OIE/FAO Reference Laboratories and Reference Centres for PPR will play a major role in supporting regional and national networks in terms of additional expertise and finance.

Given that a programme must be cost-effective, the control of other priority diseases of small ruminants should be included and the diagnostic laboratories need to be strengthened not only for the diagnosis of PPR but also for those other priority diseases simultaneously. The OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (29) provides internationally agreed diagnostic laboratory methods for purposes of trade in animals and animal products.

3.3.3 Vaccines, Vaccination and Vaccine Delivery Systems

Efficient live attenuated PPR vaccines are available that can induce lifelong protective immunity in vaccinated animals. Vaccination programmes for PPR will utilize vaccines produced following the standards in the OIE Terrestrial Manual. Only vaccine batches that have passed quality tests at the AU-PANVAC should be used in the control programmes.

The currently available PPR virus (PPRV) live attenuated vaccines are thermolabile and require uninterrupted maintenance of the cold chain from production until their application in the animal to avoid their thermal inactivation. Commercially available vaccines are in freeze-dried form and they are stable for at least two years at 2°C to 8°C and for several years at –20°C. Once the vaccine is reconstituted, it needs to be utilised as soon as possible, but not later than 30 minutes after reconstitution. Most of the PPR-endemic regions have hot climates and with poor infrastructure to maintain the cold chain needed to preserve vaccine potency and efficacy. The adoption of thermostable vaccine manufacturing technology for commercial PPR vaccine production will improve the quality of the PPR vaccines delivered to field locations and enable greater vaccination coverage.

The objective of the vaccination will be to achieve at least 80% immunity in targeted flocks, geographical areas or farming systems (critical control points) in order to break the epidemiological virus maintenance and spread (immuno-sterilisation). To obtain this level of immunity, the vaccination should aim at reaching 100% of the small ruminant populations above three months in the targeted areas or zones. This is based on the rinderpest experience, pending improved knowledge on the epidemiology of PPR including its transmissibility (R0) in different population settings and host species. Furthermore, as about 30-50% of any small ruminant population is new each year, it is

roughly estimated that it will require 2-3 vaccinations in 2-3 consecutive years to achieve immuno-sterilisation.

In order to deliver sufficient quantities of good quality PPR vaccine to the field, several factors need to be considered:

- the quality of the vaccines produced or received at the national point of entry;
- the cold chain that needs to be maintained throughout the different vaccine delivery stages, from the central production/purchase point to distribution centres and to the vaccinators in the field;
- the number of vaccine doses per vial to reduce costs and wastage (smaller dose vials for smallholder production systems and larger dose vials for large flocks);
- a realistic estimation of the required vaccine quantity, in order to provide vaccinators with a sufficient quantity to achieve the desired vaccine coverage;
- the organisation of delivery to the vaccination teams and to the flock level.
- the skill, knowledge and competency of the personnel responsible for handling the vaccine from reception to vaccination.
- Efficiency and effectiveness of communication of information to concerned parties on movement of vaccines and vaccination teams and schedules for vaccination campaigns, including prior sensitisation of animal owners.
- formulation, adoption of and adherence to SMPs and other agreed protocols.

Implementation of mass vaccination is a major challenge, particularly in remote areas and in village smallholder husbandry systems. Furthermore, recent animal censuses are often not available and the official size of the small ruminant populations may be very different from the actual figures. Vaccinations will be supervised and often carried out by the public veterinary services. In some countries, the vaccinations will be carried out by private veterinarians/para-professionals through sanitary mandates or accreditation. The participation of private veterinary para-professionals and of representatives of producers' and farmers' communities (animal health workers) can be a very effective means of reaching small ruminants in some difficult areas (e.g. remote or insecure areas), in locations where the density of animals is very low such as in smallholder village production systems in crop-based humid zones or to facilitate revaccination of young stock when required. This partnership needs to be strengthened through appropriate legislation and mechanisms for effective veterinary supervision.

Depending on the stage of a given country, vaccination can be a private or a public initiative, targeted at high risk areas or covering the entire population. Regardless of the approach, the goal should be to reach the maximum vaccination coverage in the shortest

possible time. For this purpose, the vaccination campaigns need to be carefully planned and executed. Training of teams and the provision of logistics, including the cold chain, are essential. Communication is also very important, not only at a national level or using the official channels, but also in identifying the local communication networks (radio programmes, production of TV advertisements, sponsoring public relations activities, religious or celebratory gatherings). Ignoring the communication aspects might result in frustration and the dissemination of negative information with respect to vaccination campaigns or other activities. Furthermore, a major challenge is how to correctly identify relevant socio-technical networks to be considered for the effective delivery of animal health care. When the public veterinary services or private veterinarians are not readily available to meet the animal health needs of the farmers in remote, insecure or low animal density areas, local stakeholders often take over (e.g. community animal health workers, pharmacies, traders, NGOs, development projects, etc.). Their engagement in communication and implementation of the PPR vaccination campaigns would be possible under veterinary supervision since these stakeholders can disseminate the right messages regarding the reliability/safety of the PPR vaccine. Furthermore, farmers will fully participate in the vaccination campaigns if they get the full support of their usual providers of animal care.

3.3.4 Post – Vaccination Evaluation

Vaccination is the key to preventing and controlling PPR in high risk or endemic areas. Several approaches can be used to evaluate the effectiveness of vaccination campaigns. These include post-vaccination serological surveys (sero-monitoring) at a defined time period after vaccination; evaluation of PPR incidence/ prevalence (based on passive surveillance and/or PDS); social surveys (participatory techniques to assess livestock owners' perceptions of vaccination success and other parameters) and flock productivity. If sero-monitoring is chosen as a method to assess the effectiveness of vaccination, the objectives can vary, depending on a country's epidemiological situation, budget and needs. More details including a description of different protocols to assess different objectives can be found in the Annex of the Global PPR Strategy (10).

Post vaccination serological surveys should be combined with data collection on critical competency performances and other potential risk factors for disease spread. Just as for the vaccination campaigns, conducive preconditions such as stakeholder sensitisation need to be put in place before post-vaccination evaluation (PVE).

An appropriate disease surveillance system to detect virus incursion or virus circulation, particularly in unvaccinated parts of the national flock, should be put in place to

adequately interpret the PVE results. Sampling methods and protocols can be found in the annexes of the Global PPR Strategy.

3.3.5 Vaccine Production Laboratories

In Africa, nearly all veterinary vaccine production laboratories are public institutions and are key players in regional or national animal disease control programmes. They are involved in the development, adaptation and transfer of new vaccine production technologies to the continent. The Pan African PPR Strategy may provide these institutions the opportunity for capacity building, funding, training and maintaining leadership in vaccine production either at the national or regional levels. These laboratories maintain strong linkages with AU-PANVAC within a network of laboratories. Presently, the number of PPR vaccine doses produced on the continent that are quality certified by AU-PANVAC is far short of what is required for the control of the disease and this has impacted negatively on the disease situation in Africa. There is therefore an urgent need to strengthen these laboratories in order to remedy the inadequacies in capacities for producing sufficient quantities of AU-PANVAC quality certified vaccines.

3.3.5 Communication and Awareness

Effective communication with stakeholders for awareness creation will be crucial to the success of controlling and eradicating PPR. Overall, communication and awareness initiatives will aim to:

- Enhance understanding among livestock keepers, traders, veterinary services and policy makers of their respective roles;
- Create adequate incentives and partnerships for community veterinary services delivery by enhancing public-private partnerships while promoting effective participation of the community (livestock-owners) and the private sector.

Member States will utilize the most appropriate media, formats and languages at different levels to ensure effective communication on the strategy and its implementation.

3.3.6 Capacity Development and Utilisation

Institutional capacity building is important in the development of systems and infrastructure. The personnel in charge of implementing the programme should be appropriately trained and familiar with current knowledge of the target diseases. However, the ultimate benefit from capacity building will be the utilisation of the improved systems and infrastructure and putting into practice the acquired skills to implement interventions outlined in this strategy (i.e. capacity utilisation).

3.3.7 Research and Technology

In line with the adaptive management approach, a number of learning and specific research and update activities will be undertaken to provide better knowledge and insights in order to enhance the institutional capacities, technical tools and ability to target interventions. Underpinning this is the need for a clear and up-to-date understanding of the socio-economic context in which PPR progressive control and the control of other SRDs are being undertaken so that interventions are delivered in a manner that allows socio-economic forces to effectively drive the programme to a successful and sustainable outcome. Targeted research will be necessary in the following areas:

- Economic analysis of the impacts, benefit-cost of progressive control, cost-effectiveness of control options, and incentives for economic contribution and participation
- Research on the epidemiology of PPR to better understand its transmission dynamics, the different roles of wildlife and livestock species, production systems, ecosystems and pathogen lineages with the goal of identifying optimal methods of intervention at critical control points.
- Action research and policy dialogue on public-private-community partnerships to deliver control and surveillance services. Questions include the best use of community animal health service delivery systems (including Community animal health workers), gender issues, and the role of producers' associations, non-governmental organizations or other civil society actors in service delivery. The goal is to develop and test new business models for the sustained, commercialized delivery of disease control services
- Good diagnostic tools exist. However, refinement and elaboration of diagnostics will add value to the range of existing tools. Work to define minimal performance characteristics of diagnostic assays and establish bench-marking procedures for diagnostic networks is needed. Standardization of tools should include tests for confirming outbreaks, tracking molecular epidemiology, supporting diagnostics for the field (pen-side tests) and sero-monitoring of vaccinated flocks.
- The currently widely used vaccine based on the Nigeria 75/1 strain of attenuated PPR virus has been found to be safe and effective in both research trials and during widespread field use. This technology is more than sufficient for the initiation of progressive control activities. However, improvements in vaccine thermostability and the ability to distinguish between animals immune through vaccination and those that are immune due to recovery from natural infection would be advantageous.
  - » Several approaches to thermostable vaccines have been described to the level of proof of concept. More work is needed to compare alternative approaches and to develop a full database on thermostability as an evidence base to support the

confident roll-out of a thermostable vaccine on a broad scale.

» Research to develop a marked vaccine and complementary serological tests as part of a differentiation of infected and vaccinated animals (DIVA) strategy for vaccines based on the Nigeria 75/1 strain will be supported.

» Research to develop combined vaccines for the control of PPR and other priority SRDs will also be encouraged and supported.

3.3.8 Coordination

It is the policy of the African Union that programs are implemented through the Regional Economic Communities (RECs) (Figure 3). Working through the RECs, will also enhance ownership. Accordingly, the Pan African PPR Eradication Strategy will be customized and adapted to the various regions to address regional small ruminant health problems thus assuring greater participation and impact. The RECs have been grouped into five blocks for the purpose of implementing this strategy as shown in Figure 4. For efficiency in progressing towards the control and eradication of PPR from Africa, there is need to harmonize activities in different regions. AU-IBAR will coordinate the Pan African PPR Strategy due to the recognition of:

- Its continental mandate by the Heads of State and Government of the African Union to coordinate the development and utilization of animal resources
- Proven leadership in rinderpest eradication
- African ownership and strong commitment
- Convening authority in Africa
- Its experience in mobilising Member States and RECs for action

The role of coordination will involve the convening of inclusive dialogue among all relevant stakeholders, to define and refine strategies, to harmonize approaches across regions and the continent, to assist in the process of governance, including the development of supportive policies, regulations and legislation. It will also entail knowledge management and information exchange; guidance on monitoring and evaluation activities; and strong action to advocate for programme support in technical, political and financial terms at all levels. Specifically, AU-IBAR will have the following roles in the coordination of the activities of the Strategy:

- Providing technical backstopping to RECs and Member States in the harmonization and implementation of their activities
- Building the capacity of RECs and Member States in the PPR eradication process
- Supporting cross-border coordination activities
- Ensuring intra and inter-regional coordination
- Ensuring harmonization and coordination of the strategy implementation with other

partners;

- Review and adapt the Strategy to evolving needs.

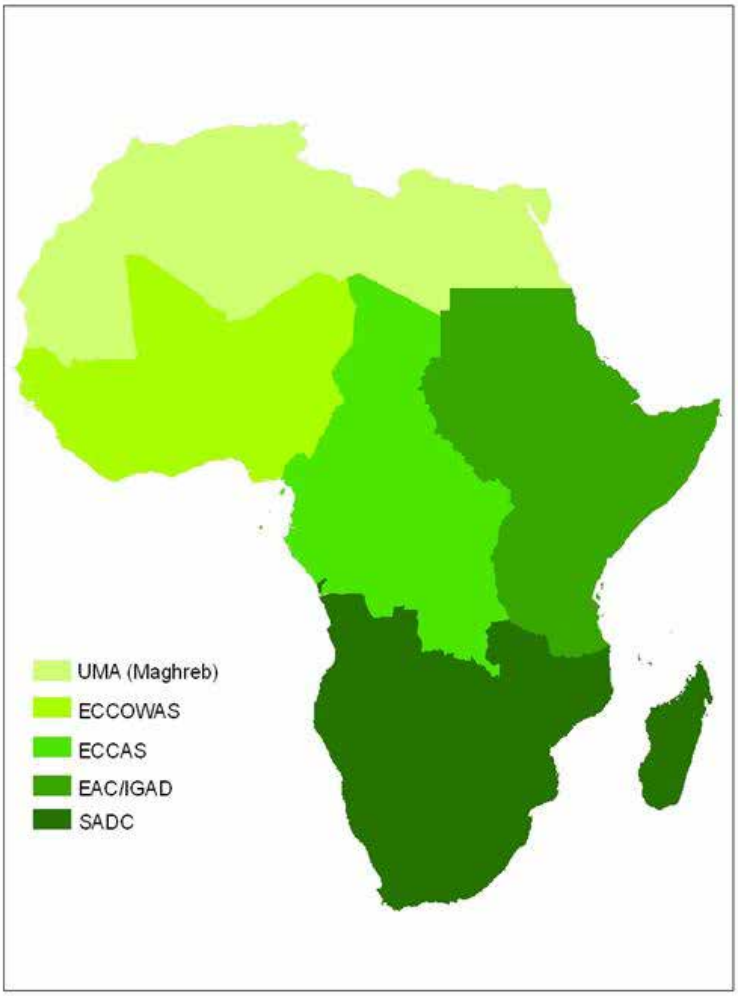


Figure 4: *Grouping of Regional Economic Communities for the Implementation of PPR Strategy*

Regional epidemiology and laboratory networks will play their respective technical coordinating roles. Regional laboratory networks will afford the opportunity to exchange information through meetings and workshops to harmonise techniques and to evaluate the results of proficiency testing (quality control of the diagnostic work being undertaken in the national laboratories that are members of the network). In each regional network, at least one national laboratory will be designated by the members of the network as the lead regional laboratory with agreed mandates and missions to coordinate with other laboratories in the region. The laboratories will be supported by the Joint FAO/ IAEA Division, an OIE Collaborating Centre for animal disease diagnosis, in close liaison with OIE and FAO PPR reference laboratories/ collaborating centres to ensure that

validation and transfer of appropriate technologies, training, virus characterisation, and organisation of proficiency testing are properly implemented.

Regional epidemiology networks will play an important role in monitoring the regional situation and conducting disease intelligence studies on PPR and other SRDs. The networks will be used for information sharing and strengthening collaboration on different aspects of surveillance (i.e. early detection, early warning and rapid response) and to support national epidemiology teams and networks. This will require specific regional meetings conducted periodically (at least once a year), to enhance personal and technical relationships. These meetings will also provide training and expertise, harmonise methods and support the coordination of strategies and activities. Regardless of the frequency of meetings, information sharing will include:

- Early detection of the appearance of disease
- Methods for assessing the health status of sheep and goat populations
- Definition of the priority geographical areas for disease control and prevention activities, including vaccination strategies and risk assessment
- Mapping small ruminant value/market chains for targeted surveillance and intervention activities
- Provision of information to plan, prioritise and conduct research

The meetings will also act as regional roadmap meetings for the exchange of information, coordination, reviewing of progress and addressing challenges. For technical back-stopping, the regional networks will need to establish links with the International Network on PPR and other SRDs to be established by FAO and OIE PPR reference laboratories.

At the national level, the Government veterinary services will coordinate and implement activities. It is anticipated that the public veterinary services will act in a manner consistent with the principles of good governance and seek to facilitate and manage activities by creating an enabling environment for broad stakeholder participation. The public veterinary services will work with private practitioners, veterinary associations, community-based organizations/programs, producers and producer associations, non-governmental organizations (NGOs) as well as value chain stakeholders and trading partners to implement the strategy.

An ecosystem approach with enhanced coordination and harmonization of activities together with the regular exchange of information between the veterinary services of neighbouring countries as was the case with the AU-IBAR Somali Ecosystem Rinderpest Eradication Coordination Unit (SERECU) project is to be encouraged.

3.3.9 OIE Standards and the Performance of Veterinary Services (PVS) Pathway

The OIE standards specific to PPR are in Chapter 14.7 of the OIE Terrestrial Animal Health Code (30) and Chapter 2.7.11 of the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (29). PPR is a disease for which countries can apply to the OIE for official recognition of their PPR free status and for endorsement of their national PPR control programmes. In addition to PPR-specific standards, there are a number of horizontal chapters which are applicable to PPR and other highly contagious infectious diseases. These include chapters related to surveillance and notification, risk analysis and the quality of veterinary services, as well as other general recommendations. There are also chapters or individual articles relating to disease prevention and control, trade measures, import/export procedures and veterinary certification, veterinary public health and veterinary legislation. More information on the relevant articles is given in Annex 3.6. of the Global PPR Strategy (10).

The OIE PVS Pathway is a voluntary, comprehensive and multi-staged process, embarked upon following request by a country and involves: the systematic evaluation of veterinary services with regard to international standards (initial OIE PVS Evaluation). The rest of the steps in the process are: five-year costed investment plans based on integrating the OIE PVS Evaluation findings with national priorities (PVS Gap Analysis); assistance in the development and/or modernisation of national veterinary legislation (OIE PVS Veterinary Legislation Support Programme); review and improvement of the Veterinary Laboratory network (OIE PVS Pathway Laboratory Mission) and capacity (OIE Laboratory Twinning Projects); strengthening and harmonising veterinary education establishments to align them with the corresponding OIE guidelines (OIE Veterinary Education Establishment Twinning Projects); ensuring excellence of the veterinary profession in the private sector by setting standards and establishing measures regarding education and licensing (OIE Veterinary Statutory Body Twinning Projects); and, lastly, a consistent mechanism for the monitoring and evaluation of progress of all components (regular OIE PVS Evaluation Follow-up Missions).

The outputs of the various steps in the OIE PVS Pathway are key development instruments for the preparation of national programmes aimed at strengthening the Veterinary services.

3.3.10 Emergency Preparedness and Contingency Planning

Emergency response teams are invaluable in helping to eliminate an animal disease outbreak before it spreads. With increasing levels of prevention and control and the corresponding decreasing levels of epidemiological risk, the need for emergency

preparedness and contingency plans becomes critical. Emergency response plans should be up to date, tested in simulation exercises and embedded in national legal frameworks. Emergency funds should be made available to cover operational costs and indemnities. The chain of command and coordination with all key players and relevant support services when necessary should be well established to ensure control efforts are executed rapidly and with success. As part of the emergency response plan, a PPR vaccine bank will be established at the continental level for rapid access for urgent use by any African country in need based on criteria to be defined by AU-IBAR in consultation with partners.

3.3.11 Standard Methods and Procedures (SMP)

In order to ensure harmony and uniformity, regions will be encouraged to develop and operationalize the standard methods and procedures (SMPs) for prevention and control of PPR and other priority animal diseases similar to those developed under the Standard Methods and Procedures in Animal Health (AU-IBAR /SMP-AH) project for the Greater Horn of Africa (GHoA), taking into account the specific regional requirements.

3.3.12 Livestock identification and traceability systems

Identification of animals and records of animal movements are indispensable in the higher stages (3 and above) to enable livestock movements to be traced during epidemiological investigations of outbreaks. This procedure, coupled with biosecurity (quarantine and movement control) along the trade routes, will greatly enhance the control and eradication efforts.

3.4 The Progressive Approach to PPR Control and Eradication

The strategic approach is based on four different stages which correspond to a combination of decreasing levels of epidemiological risk and increasing levels of prevention and control. The Stages range from Stage 1 – where the epidemiological situation is being assessed, to Stage 4 when the country can provide evidence that there is no virus circulation either at zonal or national levels, and is ready to apply for the OIE official country status of PPR freedom (Figure: 5).

The four steps are:

- Stage 1: Epidemiologic and socio-economic assessment
- Stage 2: Control
- Stage 3: Eradication
- Stage 4: Verification of absence of PPR leading to OIE accreditation of PPR free status

A progressive approach that enables a country to move from one Stage (n) to the next stage immediately after (n+1) is the preferred choice in PPR endemic countries, which coincidentally have limited resources to immediately tackle the disease on a national scale. In general terms, before moving from lower to higher stages, it is essential to fulfil the requirements of the previous stage related to the five main elements (diagnostic, surveillance, prevention and control, legal framework, and stakeholder involvement). However, for countries wishing to move rapidly and can make the appropriate investment, there is the fast track procedure, allowing them to move from 1 to 3; 2 to 4; or 1 to 4[1]. Whatever the path, stage 1 must be undertaken in order to understand the situation and decide the relevant steps forward towards eradication.

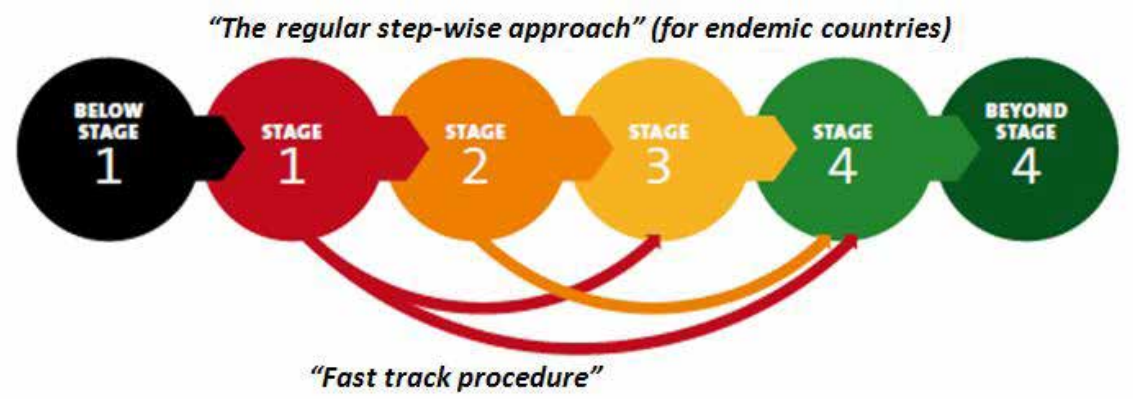


Figure 5: *Progression along the 4 stages*[2]

Stage 1: Epidemiologic and socio-economic assessment

At the beginning of stage 1, a country may be in one of the following situations:

i. PPR is present and its epidemiological situation is known. In that case activities are directed to the preparation of stage 2 or 3 according to the possibilities of the country.

ii. the precise epidemiological situation is unknown or poorly known. PPR is most likely to be present, but due to poor surveillance and weak laboratory diagnostic capacity, it has not been reported. Thus, there is no structured information available on the presence and distribution of PPR that would possibly lead to the formulation of effective control measures. In that case the objective of Stage 1 therefore is to gain a better understanding of the PPR epidemiological situation within the local socio-economic context (presence or possibly the absence) of PPR in the country, its distribution among the different farming systems and, ultimately, its impact on these systems). On the basis of this information, a country will adopt a decision to implement activities with the initial aim to eradicate PPR only in specific sectors or

[1]*This also applies to country that is supposed or known to be free, even without specific PPR epidemiological surveillance programmes in place as elaborated in Stage 1 below.*

[2]*Adopted from the Global PPR Strategy for the Pan African PPR Strategy*

geographical zones, recognising that the virus may still be circulating in other sectors/ areas (Stage 2), or eradicate PPR in the entire country (Stage3). The assessment may also demonstrate the absence of PPR, and in this case the country can directly move to Stage 4, applying for an OIE official free status.

Surveillance at this stage will have three main objectives, namely:

- To assess the health status of the small ruminant population, including collection of baseline data
- To determine the prevalence, distribution and occurrence of PPR (disease and infection)
- To define the priority areas for PPR control and prevention activities

The main activities will include but will not be limited to the following:

- Capacity building in laboratory and field diagnosis (training and equipping)
- Prevalence of PPR (sero-prevalence), risk factors and risk pathways
- Value chain analysis of small ruminant sector
- Passive reporting and syndromic surveillance
- Participatory disease surveillance
- Training in surveillance, risk and value chain analysis
- Strengthening of the national epidemiological- surveillance network, bringing all stakeholders on board
- Socio-economic studies on the impact of PPR in different husbandry/ production systems.
- Definition of geographical areas, husbandry systems at higher risk (based on high impact of PPR, high risk of spread to other areas or of regular re-introduction of new infected animals and value chain mapping)
- Formation and operationalization of a national committee to coordinate all activities related to PPR/ other SRDs prevention and control
- Development of effective communication strategy to assure stakeholder participation.
- Preparation of a comprehensive risk-based control strategy, with vaccination as the main tool

This phase will last for 1- 3 years.

Stage 2: Control

The objective of this phase will be to target mass/intensive vaccination in endemic defined geographical or production systems/ zones, (“hot spots zones”) that are potential sources of virus dissemination, so as to break the epidemiological virus maintenance

and spread (immuno-sterilisation). The objectives of surveillance will be to provide early detection on PPR appearance and monitor disease incidence and distribution.The main activities will include:

- Targeted mass/intensive vaccinations in space and time, in defined husbandry / production /ecosystems / other high risk areas or sub-populations. Ideally 2- 3 successive vaccinations in 3 years should suffice.
- Emergency vaccination in the non-targeted areas following outbreaks, or even in areas where vaccinations have been conducted already
- Post vaccination evaluation (sero-monitoring, PPR incidence, social surveys and flock productivity)
- In the free areas, the main focus will be to prevent incursions and maintain freedom from PPR through sanitary measures and surveillance.
- Enhance the participation of producers and other stakeholders by means of joint programmes, communication and operational funding.
- Raise awareness among all value chain actors on sanitary measures.
- Improve animal health service delivery systems and make use of improved technologies for disease detection and control if they become available (including rapid pen-side diagnostic tests, quality assured thermostable PPR vaccines and the combination of PPR control interventions with interventions for other priority diseases of small ruminants)

By the end of stage 2, the incidence of PPR in the vaccinated areas is expected to be nil. However, some parts of the vaccinated regions could still be at high risk because of the epidemiological situation in neighboring countries; while pockets may still exist in the non-vaccinated areas. Cumulative surveillance data will be used to revise the control strategy, leading to more aggressive eradication strategy risk maps and concurrently refine the targeting of control interventions in order to embark on eradication.

This phase will last 3-5 years.

Stage 3: Eradication

The objective of this stage is to eradicate PPR from the national flock. Overall, the phase will focus on enhancing disease surveillance and early detection and response interventions in areas where the disease will continue to persist. Thus, the surveillance objectives will be:

- To provide early detection of possible PPR appearance
- To explain the reasons for possible introduction of virus, to monitor the results of the immediate response and to give guidance for possible refining of the prevention and

emergency response plan if appropriate
- To demonstrate the absence of PPR clinical disease or infection with PPR virus.

Accordingly, the country will need the capability and resources to adopt a more aggressive control strategy to suppress virus replication in those premises where new clinical outbreaks may be detected. Therefore, the following must be in place:
- Any health events that could be related to the presence of PPR virus must be promptly detected and reported and appropriate measures immediately put in place
- The country must have the capacity to implement the contingency plan of the eradication strategy
- For each cluster of infection or outbreak, a plausible explanation should be found through outbreak tracing and is followed up by immediate measures and post-outbreak surveillance, and review of the impact of control measures (vaccination, bio-security).

Activities during this phase will include bio-security measures, community awareness campaigns, surveillance including enhanced passive surveillance and reporting, syndromic surveillance, participatory disease surveillance and sentinel surveillance, and development and activation of contingency plans. Others will include further development of an enabling environment for disease control activities and appropriate interventions for other SRDs.

To move to Stage 4, there should be a body of evidence that PPR virus is not circulating endemically in domestic small ruminants within the country/ zone and that each new outbreak is shown to originate from outside of the country or zone. At this stage, a MS may apply to the OIE for the endorsement of its national PPR control programme.

This stage will last for 3-5 years.

Stage 4: Verification of eradication and OIE accreditation of PPR free status

The aim of this stage will be to build evidence that after cessation of vaccination, there is no clinical disease and no virus circulation. Entry to this phase could be on a countrywide basis or on a zonal basis (where distinct free and infected zones exist). There shouldn't be any vaccination, otherwise the country or zone is downgraded to stage 3. Emergency preparedness and contingency planning will be further strengthened. The surveillance objectives will be as in the previous stage but with newer activities. Thus the stage will entail more intensified surveillance including random surveys for proof of absence of PPR in compliance with the provisions of the OIE Terrestrial Code Chapter 14.7. (Articles

14.7.29., 14.7.30. and 14.7.31.) (32).

This stage will last for 4-6 years.

Timeline

As for the Global PPR Strategy, the Pan African PPR Strategy is structured on a stepwise progression, from an unknown situation for a country to the declaration of the eradication of the disease. The progress along this pathway will be based on the expected achievements by each AU Member State in the implementation of activities linked to each stage. The achievements will be assessed yearly using the monitoring and evaluation (M&E) framework of the Pan African PPR Strategy and the tools developed for the Global PPR Strategy (i.e. the PPR Monitoring and Evaluation Tool (PMAT) and the Post Vaccination Evaluation Tool (PVE). For management purposes, an estimated duration has been made for the completion of activities at each stage and the sequential progress to be made along the pathway to reach the final PPR eradication by 2030. The timeline in the Pan-African PPR Strategy aligns to that in the Global Strategy as outlined below:

Timeline of expected results: Africa

Region	2015					2020					2025					2030				
Stage	0*	1	2	3	4/5	0*	1	2	3	4/5	0*	1	2	3	4/5	0*	1	2	3	4/5**
No of countries	3	19	19	3	11	0	4	25	12	14	0	0	8	24	23	0	0	0	0	55
%	5	35	35	5	20	0	7	46	22	25	0	0	15	44	43	0	0	0	0	100

3.5 Control of other Small Ruminant Diseases

The tools for PPR eradication will be implemented simultaneously with those for the control of other SRDs to optimize the use of available funds and other resources. Reference Centres and regional and international diagnostic networks already exist for many diseases, but for some, disease-specific joint OIE/FAO international and regional networks may still be needed. The same applies to networks of epidemiology centres and regional epidemiology networks. Vaccines against other SRDs exist and the issue of availability and quality control will need to be addressed as outlined for PPR.

3.6 Strengthening of Veterinary Services

Achieving progress in PPR eradication (i.e. reaching higher stages) and control of other SRDs implies having created an appropriate enabling environment for disease control (i.e. having improved the capacities and capabilities of the veterinary service). This implies that the veterinary services are also better equipped and better prepared to deal with the control of other priority animal diseases.

The OIE Performance of Veterinary Services (PVS) Pathway will be the major tool to structure and plan the activities and assess progress. Relevant articles of the OIE Terrestrial Animal Health Code (Terrestrial Code) and Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (Terrestrial Manual) will guide and highlight the requirements for countries to have their national PPR control programme endorsed by the OIE or to apply for PPR free status recognition. Countries progressing along the stages will have to develop in parallel their veterinary services to be able to fulfill the criteria. The OIE PVS critical competences and the targeted OIE PVS level of advancement and a correspondence table between the stages and the compliance level required for each of the PVS critical competencies (CCs) [4]relevant to PPR control adopted from the Global PPR Strategy are contained in Annexes 3 and 4 respectively. The Strategy recognizes that the approach and the activities proposed under "Strengthening Veterinary Services" are not PPR-specific and therefore are expected to have spill-over effects on the control of all major TADs.

At the national level, the activities under this component will address various categories of support, such as surveillance systems, laboratories, biosecurity, movement control, identification of farms and animals, wildlife surveillance, legislation and transparency, socioeconomic expertise, emergency preparedness, public-private partnerships, monitoring and evaluation, and communication. Thus, capacity building will be an important activity at the national level.

At the regional and continental levels, the activities will address coordination, support to disease-specific laboratories and epidemiology networks, joint capacity building workshops, strengthening of regional animal health expertise and participation in regional conferences on animal health.

[4]*It is not mandatory to fulfil all CCs for moving up from one stage to another.*

4. RESOURCE MOBILIZATION

Resource mobilization for the PPR strategy will be undertaken at three levels, namely: continental, Regional Economic Communities and Member States. Relevant activities at continental level to be undertaken by the AUC (AU-IBAR and AU-PANVAC) will include:

- Pursuing a broader and diverse resource base;
- Cooperation with non-traditional development partners (such as Foundations);
- mobilization of necessary resources that will enable it to play its coordination role;
- support to RECs and MS in securing the required resources for eradication of PPR.

At the regional economic community level, the Pan African PPR Strategy will be adapted to the RECs' own specificities and accordingly, the RECs will prepare regional programmes to implement the strategies with the support of AUC as indicated above. The RECs will leverage their strategic partnerships to mobilize resources for implementation of the strategy based on their respective resource mobilization strategies. Generally, funds will be sourced as follows:

- By increasing funding from MS
- By increasing funds available from current partners towards core funds,
- By pursuing a broader and diverse resource base including donor funding

At the Member States level, line Ministries will lead other stakeholders in the formulation of PPR eradication programmes based on the National Strategy aligned to the Pan African and respective regional PPR Strategies and thereafter jointly plan and undertake advocacy with the key decision makers in order to enlist their support and commitment for the implementation of the programmes. In particular, they will need to vigorously engage the Ministries of Finance and National Planning for inclusion of the funding requirements for the programmes into the annual budgetary allocations of the line Ministries responsible for livestock. This will guarantee the provision of national resources to support the implementation of the programmes. Continued annual allocations in the national budgets over the duration of the programmes will support the sustainability of their implementation. The constant engagement of parliamentarians and other key decision makers especially from the livestock dependent communities will enhance the advocacy efforts.

In addition to the national budgetary allocations, the Line Ministries will endeavour to engage partners in the private sector, target communities and the donor community for the mobilization of additional resources to implement the programmes. Project proposals on different components of the strategy could be prepared for possible funding and/or implementation by the different partners.

4.1 Cost of the strategy

This PPR strategy will be translated into concrete actions, at the national, regional and continental levels. It is therefore essential to develop an Action Plan to launch, foster, sustain, coordinate and streamline interventions and actions by the different stakeholders to be engaged in the prevention and control of PPR and other SRDs in Africa. The costing for the implementation of the Pan African PPR Strategy will be based on the Action Plan and intervention programmes to be implemented at national, regional and continental levels. The costs at the national levels will entail provisions for all the PPR and other priority small ruminants' diseases eradication and control interventions and the strengthening of the capacities of the veterinary services. At the regional level, the costing will ensure the provision of sufficient resources for regional coordination, institutional strengthening and back-stopping for the Member states of the respective RECs.

At the continental level the costs will cover the continental level management for the overall coordination, oversight, partnership platforms, technical support and monitoring and evaluation of implementation of the strategy.

This strategy takes cognisance of on-going initiatives on costing of the implementation of the Global PPR Strategy. Detailed budgets outlining the costings for implementation of the Pan-African PPR strategy at the three levels will be compiled following the completion of the costing of the Global PPR Strategy by FAO and OIE.

5. REFERENCES

1. Alessandro Ripani., Review of PPR in North Africa Region: 10th JPC REMESA-Heraklion, Greece (16-17 March 2015)
2. Diallo, A. 2006 Control of PPR and Poverty Alleviation. J. Vet Med., 53: 11-13
3. Elsawalhy A.A., Mariner, J.C. Chibeu M.D. Wamwayi H., Wakhusama S., Olaho-Mukani W. and Toye P. (2010). Pan African Strategy for the Progressive Control of Peste des Petits Ruminants. Bulletin of Animal Health and Production in Africa 58, 191 - 200
4. FAO (2009). The impact of Peste des Petits Ruminants on livelihoods in the arid and semi-arid lands of Kenya. ECTAD-Nairobi Working Paper 2012
5. FAO (2012). Taming the "goat plague" in the Horn of Africa. http://www.fao.org/africa/sfe/sfe-news/detail-news/en/c/161345/?no_cache=1
6. FAO (2013). Enquête sur l'impact économique de la PPR en Mauritanie. Ahmed Salem El Arbi, Consultant. TCP/RAB/3302. FAO SNE Tunis.
7. FAO (2013). FAO Statistical Yearbook 2013 (20 year average (1993-2013)).
8. FAO Global Perspective Studies Unit
9. Global Framework for Trans-boundary Animal Diseases (GF-TADs) 5 Year Action Plan for 2013 -2017
10. Global Strategy for the Control and Eradication of PPR
11. Hill D.H., 1983. History, epidemiology and, economic significance of PPR in West Africa and Nigeria in particular. PPR in Sheep and Goats. In Proceedings of the International Workshop Held at IITA, Ibadan, Nigeria. 24-26 September 1980. http://www.ilri.org//InfoServ/Webpub/fulldocs/PestePeste_des/History.htm
12. htt://www.oie.int/animal-health-in-the-world/official (accessed on 26th June 2015).
13. ILRI (2013). Second Global PPR Research Alliance Meeting , April 2013, Nairobi Kenya
14. Kock R. (2013) PPR in wildlife. At the OIE "Seminar on Peste des Petits Ruminants (PPR) Prevention and Control in the SADC Region". Dar es Salaam, Tanzania. June 10-12, 2013. http://www.rr-africa.oie.int/en/news/20130626.html
15. Livestock Development Strategy for Africa (LiDeSA)
16. Nicolas Antoine–Moussiaux, Véronique Chevalier, Marisa Peyre, Shaif Abdo Salem Abdullah, Pascal Bonnet & François Roger (2012). Economic impact of RVF outbreaks on trade within and between East Africa and the Middle East. In : Proceedings of the GF-TADs (FAO & OIE) inter-regional conference on Rift Valley Fever in the Middle East and the Horn of Africa : challenges, prevention and control, November 12 - 15th, 2012, Mombasa, Kenya. English. OIE, Paris.
17. Online conference "Establishment of a PPR Global Research and Expertise Network" or PPR-GREN, organised by FAO and OIE and moderated by Dr. Paul Rossiter.
18. Pan African Animal Health Yearbooks 2008

19. Pan African Animal Health Yearbooks 2009
20. Pan African Animal Health Yearbooks 2010
21. Pan African Animal Health Yearbooks 2011
22. Pan African Animal Health Yearbooks 2012
23. Pan African Animal Health Yearbooks 2013
24. Pan-African Program for the Progressive Control of Peste des Petits Ruminants (PCP-PPR)
25. Rossiter, P.B. Peste des Petits Ruminants (2004). In :Coetzer, J. A. W., Tustin, R. C. (eds.). 2004. Infectious Diseases of Livestock, 2nd edition, Oxford University Press, Cape Town.
26. The African Union Pastoral Policy Framework
27. The Comprehensive African Agriculture Development Programme (CAADP)
28. The IGAD Regional Peste des Petits Ruminants Progressive Control and Eradication Strategy
29. The OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals
30. The OIE Terrestrial Animal Health Code
31. Vivien Knips, 2004. Livestock Sector Report Horn of Africa: Review of the Livestock Sector in the Horn of Africa (IGAD Countries)
32. World Organisation for Animal Health (OIE)- (2015)- World Animal Health Information Database (WAHID). Available at: web.oie.int

6. ANNEXES

Annex 1: PPR Monitoring and Assessment Tool (PMAT)

The PPR Monitoring and Assessment Tool (PMAT) is a companion tool to the Global PPR Strategy whose aim is to categorise countries according to the four different stages that correspond to a combination of decreasing levels of epidemiological risk and increasing levels of prevention and control as shown in the table below.

PPR Stages / Elements	Stages 1 (Assessment)	Stages 2 (Control)	Stages 3 (Eradication)	Stages 4 (Post-eradication)
Diagnostics	To establish laboratory diagnostics capacity mainly based on ELISA methods	To strengthen the laboratory capacity through the introduction of bio-molecular method for a better characterisation fiels strains	To further strengthen laboratory capacity to surpport eradication through the introduction of a laboratory quality assurance system	To maintain laboratory capacity as in the previous stage and strengthen the differential diagnostics pathways. To start implementing PPR sequestration activities
Surveillance	To implement monitoring activities and evaluate socio economic impacts	To implement survaillance incorporating a responce mechanism and risk mitigation measures	to strengthen surveillance incorparating and emergency responce mechanism	to shift the goal of survailance to providing the absence of PPR
Prevention and control	To lay the ground for the implementation of prevention and control activities	To implement targeted caccination campaings on an area or production system basis and thereby manage secondary prevention in the whole country	To achive eradication either through extending vaccination to areas/production systems not yet vacinated or by adopting a more aggresive policy to suppress virus replication in	To suspend vaccination. Eradication and prevention measures are based on stamping out, import movement control biosecurity measures and

PPR Stages / Elements	Stages 1 (Assessment)	Stages 2 (Control)	Stages 3 (Eradication)	Stages 4 (Post-eradication)
			identified outbreaks	risk analysis to understand the potential pathways of (re) introduction of PPR
Legal framework	To assess the animal health legal framework with a focus on PPR	To improve the legal framework to surpport the implementation of control activities in targeted sectors	To further improve the legal framework to support prevention risk mitigation at population level, incleding the risk of PPR introduction from abroad, and possibly accommodate a commpenensation mechanism	to further improve the legal framework to accommodate more stringent border control policies, prepare additional legal provisions (such as cointainment) to implement in the context of an official PPR free status
Stakeholders involvement	To engage for their agremment and cocurrence on the PPR control and eradication objectives (notably in terms of transparency)	To actively involve stakeholders in increased reporting and in targeted sectors in the realisation of vaccimnation campaigns	To fully involve stakeholders in establishing procedures for accessing compensations funds in the event of PPR outbreaks	To keep stakeholders fully vigilant and committed with regard to PPR

The classification of any specific country into a given stage (= level of risk) is the result of a combination of 5 main elements, namely: PPR diagnostic systems; PPR surveillance systems; PPR prevention and control systems; legal framework in place for PPR prevention and control; and stakeholders involvement in PPR control and eradication.

PPR diagnostic systems- effective control of PPR requires that basic reliable laboratory diagnostic services are operational within individual countries (preferred option) or are

outsourced. The capability of field veterinarians and their skill in recognising PPR and initiating a differential diagnostic procedure should be part of the overall diagnostic system.

PPR Surveillance system(s) – surveillance is key to understanding of the PPR epidemiology in a country as well as monitoring progress in the control and eradication efforts. Along the stages to control and eradicate the disease, the surveillance system is likely to become more and more complex. In any case, comprehensive surveillance activities imply a thorough understanding of the production and trading systems (value chains).

PPR Prevention and control system(s) – PPR prevention and control measures are a combination of different tools, which can include vaccination, improved biosecurity, animal identification, movement control, quarantine and stamping out. These individual tools are likely to be applied at different levels of intensity while a country is moving along the pathway.

Legal framework in place for PPR prevention and control –legislation is the cornerstone that provides the Veterinary Services with the necessary authority and capability to implement surveillance, prevention, control and eradication activities. For each stage in the PPR control and eradication process, it should be guaranteed that the legal framework in place is consistent with the types of activities due to be carried out.

Stakeholders' involvement in PPR control and eradication – true progress in PPR prevention, control and eventual eradication cannot be achieved without the serious involvement of relevant stakeholders in all sectors (private and public veterinarians, paraprofessionals, livestock keepers and their community-based animal health workers, livestock traders, market operators, NGOs, regional and international agencies and other development partners). This implies defining their roles and responsibilities at each stage and control efforts are therefore likely to be a combination of public and private contributions. This also implies strong awareness and communication strategies directed to all these different actors.

The PMAT also guides and facilitates the efforts of countries that have embarked on prevention and control activities, notably PPR-endemic countries by giving guidance and milestones based on epidemiological and activity based evidence as shown below.

Annex 2: PPR Milestones (outcomes) and activities

Stage 1 PPR outcomes and activities (Component 1)

Outcome 1 (diagnostic System) **The laboratory diagnostic capacity of the country is established** (activities will largely depend on the status of the laboratory facilities, equipment and expertise already available in the country). **A – In-country laboratory diagnostic capacity is established**	**A1.1 (A)**	Assess throughout the country existing laboratory facilities candidates to be designated as the National Laboratory that will be responsible for testing field samples. This process should lead to identify at least one laboratory that will act as leading laboratory for PPR
	A1.2 (A)	Assess throughout the country existing laboratory facilities to be designated as peripheral units to receive and prepare samples before they are sent to the designated leading laboratory/ies
	A1.3 (A)	Establish (or review) ELISA diagnostic procedures for antigen and antibody detection
	A1.4 (A)	Train peripheral units' staff to manipulate PPR samples before they are sent to the leading laboratory for testing
	A1.5 (A)	Test samples (using basic ELISA techniques) and document them (if the laboratory has just started its activities)
	A1.6 (A)	Design a Laboratory Information and Management System (LIMS) if not already existing (no specific indicators are built for this activity)
B – laboratory diagnosis is outsourced internationally	**A1.1 (B)**	Formulate Standard Operating Procedures on how to handle field samples (if not already existing)
	A1.2 (B)	Train all staff involved in the reception of field samples to receive, record, manipulate, package and ship the field samples received
	A1.3 (B)	Collect and ship samples to an OIE or FAO reference laboratory
Outcome 2 (Surveillance System) **A surveillance system is progressively established; however, at this stage, active surveillance should be fully operational allowing an understanding of how PPR may be introduced and/or maintained and what its impact is.** The monitoring/surveillance system will include implementation of specific field surveys based on serology and/or participatory disease surveillance (PDS) or some other approaches. The case definition for a possible and likely case of PPR is developed (to serve as basis for building the reporting system and for delivering training to field veterinarians).	**A2.1**	Formulate/design and implement an overall monitoring/surveillance system (with its active and passive components)
	A2.2	Develop related Procedures for each component (continuing vs. *ad hoc* surveys) of the surveillance system, as well as Forms to register data
	A2.3	Implement a post-assessment evaluation Form to quantify the clinical and (possibly) the socio-economic impact at this Stage. Visit confirmed clinical outbreaks for such purposes
	A2.4	Design (and possibly implement already at this Stage) an information system in support of surveillance activities (each component and sub-component of the system should be managed through an information system)
	A2.5	Train veterinary officers from central and peripheral level on value chain and risk analysis
	A2.6	(VS) Identify risk hotspots and transmission pathways using the value chains and risk analysis principles
Outcome 3 (Surveillance Systems) **The ability of field veterinarians to relate health events to PPR is improved.** Organisation of a well-distributed Field Veterinary Network throughout the territory as well as the education of field veterinarians to recognise PPR and make a differential diagnosis are essential aspects in order to capture clinical events that may match the case definition of a possible case of PPR and ensure that such cases are adequately further investigated.	**A3.1**	Train field veterinarians to increase their awareness about PPR and its differential diagnosis (training should also address collection, storage and submission to the closest delivery place in proper condition and to avoid potential spoiling of test results).
	A3.2	Provide incentives for the installation of private veterinarians in remote areas to capture PPR clinical events

Outcome 4 (Prevention and Control system) A national PPR Committee is established to coordinate all activities related to PPR prevention and control measures. The Committee should be headed by the Central Veterinary Services and include representatives of other ministries / agencies involved in PPR control (Environment; Interior; etc.) as well as private veterinarians (Veterinary Statutory Bodies and Veterinary Association) and all actors involved in small ruminant production. No official prevention activity is foreseen in Stage 1	**A4.1**	Define the modus operandi and tasks of the National PPR Committee
	A4.2	Organise meetings of the PPR Committee and prepare meeting reports
	A4.3	Formulate/design and implement a Standard Operating Procedure for a response mechanism (appropriate to this Stage) in case of a suspected/ confirmed outbreak *(In order for such procedures to be fully implemented, it is necessary that awareness material be prepared and distributed to livestock keepers (see Stage 1 Outcome 6).*

B – laboratory diagnosis is outsourced internationally	**A1.1 (B)**	Formulate Standard Operating Procedures on how to handle field samples (if not already existing)
	A1.2 (B)	Train all staff involved in the reception of field samples to receive, record, manipulate, package and ship the field samples received
	A1.3 (B)	Collect and ship samples to an OIE or FAO reference laboratory

Outcome 2 (Surveillance System) A surveillance system is progressively established; however, at this stage, active surveillance should be fully operational allowing an understanding of how PPR may be introduced and/or maintained and what its impact is. The monitoring/surveillance system will include implementation of specific field surveys based on serology and/or participatory disease surveillance (PDS) or some other approaches. The case definition for a possible and likely case of PPR is developed (to serve as basis for building the reporting system and for delivering training to field veterinarians).	**A2.1**	Formulate/design and implement an overall monitoring/surveillance system (with its active and passive components)
	A2.2	Develop related Procedures for each component (continuing vs. *ad hoc* surveys) of the surveillance system, as well as Forms to register data
	A2.3	Implement a post-assessment evaluation Form to quantify the clinical and (possibly) the socio-economic impact at this Stage. Visit confirmed clinical outbreaks for such purposes
	A2.4	Design (and possibly implement already at this Stage) an information system in support of surveillance activities (each component and sub-component of the system should be managed through an information system)
	A2.5	Train veterinary officers from central and peripheral level on value chain and risk analysis
	A2.6	(VS) Identify risk hotspots and transmission pathways using the value chains and risk analysis principles

Outcome 3 (Surveillance Systems) The ability of field veterinarians to relate health events to PPR is improved. Organisation of a well-distributed Field Veterinary Network throughout the territory as well as the education of field veterinarians to recognise PPR and make a differential diagnosis are essential aspects in order to capture clinical events that may match the case definition of a possible case of PPR and ensure that such cases are adequately further investigated.	**A3.1**	Train field veterinarians to increase their awareness about PPR and its differential diagnosis (training should also address collection, storage and submission to the closest delivery place in proper condition and to avoid potential spoiling of test results).
	A3.2	Provide incentives for the installation of private veterinarians in remote areas to capture PPR clinical events

Outcome 4 (Prevention and Control system) A national PPR Committee is established to coordinate all activities related to PPR prevention and control measures. The Committee should be headed by the Central Veterinary Services and include representatives of other ministries / agencies involved in PPR control (Environment; Interior; etc.) as well as private veterinarians (Veterinary Statutory Bodies and Veterinary Association) and all actors involved in small ruminant production. No official prevention activity is foreseen in Stage 1	**A4.1**	Define the modus operandi and tasks of the National PPR Committee
	A4.2	Organise meetings of the PPR Committee and prepare meeting reports
	A4.3	Formulate/design and implement a Standard Operating Procedure for a response mechanism (appropriate to this Stage) in case of a suspected/ confirmed outbreak *(In order for such procedures to be fully implemented, it is necessary that awareness material be prepared and distributed to livestock keepers (see Stage 1 Outcome 6).*

Outcome 5 (Legal Framework) The legal framework is improved during this Stage to ensure that the Veterinary Services have the authority to take actions that may be needed in the following Stages; in particular, PPR is a notifiable disease in the domestic animal population and suspected/confirmed cases in the wild animal population are also notified to the Veterinary Authorities.	**A5.1**	(National PPR Committee) Establish specific Working Groups (involving competent authorities, legal experts and relevant stakeholders) to evaluate gaps in the veterinary legislation with regard to PPR that may need to be addressed
	A5.2	(WGs). Propose concrete amendments to update the legal framework conducive to efficient PPR prevention and control

Outcome 6 (Stakeholders' Involvement in PPR control) A communication campaign is organised to inform all stakeholders on the vision and on the required actions and why they are put in place. The objectives of the campaign are to promote, stimulate and provide incentives for PPR control measures. Field veterinarians may serve as the means for disseminating the campaign material as well as some other development partners such as NGOs.	**A6.1**	Prepare/develop communication material to inform stakeholders on PPR control and ultimately the eradication Vision
	A6.2	Disseminate the material to all stakeholders involved in PPR prevention and control activities

Stage 2 PPR outcomes and activities (Component 1)

Outcome 1 (Diagnostic system) **The laboratory diagnostic system works with a higher level of efficiency than in Stage 1 as possible shortcomings identified are now being solved; in addition, the system is further improved by introducing the use of bio-molecular techniques to obtain a characterisation of field virus isolates.** The assumption used is that molecular epidemiology may provide additional insights into PPR distribution and dissemination pathways. Should this not be a feasible option, a link with an international reference laboratory is established to which representative samples can be sent. Characterisation of field virus isolates – and more generally the upgrading of laboratory capacity – is facilitated by the involvement of one or several national laboratories in the Regional Laboratory Network (when existing).	A1.1	Train laboratory staff in bio-molecular testing methods and equip at least one laboratory, if the use of biomolecular testing is an option
	A1.2	Establish and regularly update Standard Operating Procedures for biomolecular testing
	A1.3	Establish written protocols to define criteria to select samples eligible for being processed using biomolecular techniques
	A1.4	Test all submitted samples meeting the eligible criteria for bio-molecular testing
	A1.5	Participate in international proficiency test led by either an International Reference Laboratory or a Regional laboratory designated as leading laboratory in the regional network

Outcome 2 (Surveillance System) **The surveillance system is further strengthened:** **– notably in its passive surveillance component** **– to capture any possible event linked to PPR.** New components are now added into the system, namely: *(I)* passive surveillance in slaughterhouses and markets; *(II)* passive surveillance in wildlife through functional external coordination with the Ministry in charge of wildlife/environment/hunters' organisations (some wild animals may act as sentinels, indicating any spill-over of PPR virus from domestic small ruminants); and *(III)* involvement in the (sub-)Regional Epidemio-surveillance Network (when existing).	A2.1	Train inspectors in slaughterhouses to increase their awareness of PPR and its differential diagnosis (training should also address sample collection, storage and submission to the closest delivery place in proper condition and to avoid potential spoiling of test results)
	A2.2	Design a procedure to improve external coordination with MoE and other organisations involved in wildlife management (notably for improved reporting of PPR cases in wildlife)
	A2.3	Organise an awareness campaign on PPR for hunters
	A2.4	Participate in Regional Epidemio-surveillance Network activities (when existing); feed the Network with appropriate sets of data

Outcome 3 (Prevention and control system) **A targeted vaccination campaign is implemented.** The government has decided to allocate some financial resources to the PPR vaccination programme in the targeted area or sub-population (vaccination in other zones may remain a private initiative). The targeted vaccination zone or subpopulation may evolve during Stage 2, notably upon detection of clinical outbreaks outside the initial targeted zone and constantly taking into account the results of the monitoring system in place.	A3.1	Formulate/design field vaccination Procedures (according to the strategy adopted by the country) for this purpose, the National PPR Committee appoints a specific Working Group
	A3.2	Train field vaccination teams
	A3.3	Implement field vaccination (according to the strategy adopted by the country)
	A3.4	Conduct PPVE with collection of data for evaluating the results of the vaccination programme and monitor the whole vaccination chain accordingly

Outcome 4 (Prevention and control system) Additional measures are put in place to ensure the success of the vaccination campaign. In particular, *(I)* all outbreaks are investigated to *(a)* clearly understand why clinical outbreaks may be observed in the sectors/zones covered by the vaccination, and *(b)* assist in deciding if the vaccination sectors/zones needs to be extended or not (in this case, it will remain limited to what is indicated in Stage 1); and *(II)* animal movements (within the country at this Stage) are controlled to ensure that the 2 sub-populations with a different health status as a result of the vaccination campaign remain separate; however, some countries may not be in a position to efficiently regulate animal movement. In such a case, it could be feasible to manage the obligation of introducing only vaccinated animals (or animals to be vaccinated) in those sectors/areas where targeted vaccination is on-going.	A4.1	Design an outbreak investigation Form to collate the following information: *(I)* possible date of introduction of the virus into the infected premises; *(II)* possible means of introduction; and *(III)* potential spreading
	A4.2	Conduct investigations for all detected/reported outbreaks, whether in or outside the vaccination sectors/zones
	A4.2	Implement movement controls between the vaccinated/non-vaccinated sectors/zones, in close collaboration with other Services involved (police notably)

Outcome 5 (Legal framework) The legal framework is enforced to fully support the prevention and control activities foreseen in Stage 2.	A5.1	Organise meetings of specific working groups (mixed VS, other authorities, and stakeholders) to better understand the impact of control measures (including financial aspects) on stakeholders and upgrade the legislation framework to support field control activities
	A5.2	Propose concrete amendments to update the legal framework conducive to efficient PPR prevention and control

Outcome 6 (Stakeholder Involvement) The Stakeholders fully contribute to the control efforts foreseen in Stage 2. This notably implies that the stakeholders *(I)* facilitate the vaccination operations in the field – for instance by gathering the animals and handling them; *(II)* respect the movement restrictions within the country; and *(III)* ensure the early reporting of suspected clinical outbreaks to the VS; at this Stage, early reporting of suspected clinical outbreaks – in particular in the targeted vaccination areas/ production systems – is critical to adjust the control measures already put in place. Awareness and communication are key.	A6.1	Prepare and disseminate informative material to increase awareness among livestock keepers and thereby facilitate reports of suspected cases.
	A6.2	Prepare communication material to explain and convince (advocacy) all stakeholders particularly farmer that control of PPR is needed
	A6.3	Organise meetings with the livestock keepers and their partners active in the field (NGOs, etc.)
	A6.4	Should wildlife be identified among the issues to be addressed, organise meetings involving wildlife specialists and other stakeholders (such as hunters)

Stage 3 PPR outcomes and activities (Component 1)

Outcome 1 (Diagnostic system) The Laboratory starts to develop a quality assurance scheme. Laboratory maintains at least the same level of activities as in the previous Stage, while putting Quality Assurance in place, at least for all laboratories used by the Veterinary Services. A strong link with an international reference laboratory is also maintained.	A1.1	Implement a quality control system in the central laboratory and its branches constituting the laboratory network in the country, and develop all procedures related to the manipulation and testing of samples for PPR virus according to the standards of a quality assurance scheme
	A1.2	Implement collateral procedures to ensure that stocks of reagents, laboratory devices, equipment, etc. are purchased following quality assurance procedures in all the laboratory/ies involved in the diagnosis of PPR

Outcome 2 (Surveillance system) **The surveillance system has been further upgraded and includes specific components addressing early warning.** The surveillance system continues to operate as indicated in previous Stages but in addition, its sensitivity is increased in Stage 3: *(i)* information on neighbouring countries (or on countries from which animals/goods are imported that may carry the virus) is now routinely collected; *(ii)* high resolution surveillance may target specific sub-groups (newborn animals not yet vaccinated) or cattle as proxy indicators of virus circulation; *(iii)* the activities to detect cases in wildlife are increased.	A2.1	Establish procedures to capture PPR health events in neighbouring countries or countries from which animals are imported. *The group dedicated to qualitative Risk Assessment already identified in Stage 1 should conduct this work*
	A2.2	Design and implement surveillance in those subpopulations or areas where the events can be captured and misinterpretation is minimised
	A2.3	Increase the collection of sero-surveillance data from wildlife and other susceptible species

Outcome 3 (Prevention and control system) **A more aggressive control strategy is in place aimed at eradication and possibly supported (if feasible) by a stamping-out policy (linked to a compensation scheme).** It may be that either *(i)* a whole area or country vaccination programme or *(ii)* a targeted vaccination programme will be implemented as part of a more aggressive control strategy. In both cases it is expected that the control policy will lead to eradication. The vaccination programme is defined according to the results of Stage 2 vaccination (Post-Vaccination Evaluation [PVE]) and continuous surveillance. In case of *(ii)*, an emergency preparedness and contingency response plan are now also implemented, possibly linked to a stamping-out policy, to control promptly a clinical outbreak of PPR in the infected premises and to reduce the infectious period at flock level. Breeders are encouraged to reinforce the biosecurity measures at farm level (this may be linked to the level of compensation in the event of stamping out); biosecurity is also reinforced in live markets.	A3.1	Implement vaccination campaigns in areas where virus still circulates (in already vaccinated areas and/or in unvaccinated areas) according to the results of continuous monitoring and evaluation of the results of Stage 2. All vaccinated animals will be identified at the same time
	A3.2	Conduct surveillance activities and PVE with collection of data for evaluating the results of the vaccination programme and monitor the entire vaccination chain accordingly
	A.3.3	Develop a contingency plan in case of *(ii)*, officially endorsed and approved by the Veterinary Authorities. *The National PPR Committee will assign a group of experts (which could be supported by international experts if required) to formulate such a contingency plan*
	A.3.4	Test the correct application of the contingency plan through field simulation exercises as part of the activities to maintain a high level of awareness
	A3.5	Carry out prompt preliminary precautionary measures once a suspicion is raised (they are withdrawn if the outbreak is not confirmed or are immediately followed up if the outbreak is confirmed)
	A3.6	Implement prompt measures to contain virus spread once an outbreak is confirmed (whether this should be based on animal movement restrictions, culling or emergency vaccination, or a combination of these, is a country policy choice)
	A3.7	Design and implement field procedures to officially close an outbreak and lift the restrictions put in place to be done by the National PPR Committee
	A3.8	(Voluntary) Submit a national control programme to the OIE for official endorsement, in accordance with the provisions of the OIE *Terrestrial Animal Health Code* (Chapters 1.6. and 14.7)

Outcome 4 (Legal framework) **The veterinary legislation includes clear provisions for: (i) compensation for small ruminants culled for disease control purposes (should stamping-out be adopted as one of the control policies), and (ii) improved biosecurity in live markets and at farm level. The PPR legal framework is properly enforced.** Implementation of an identification system for small ruminants is an asset to improve their traceability and movement control.	A4.1	Develop a procedure to compensate farmers whose animals were culled for disease control purposes. *(The National PPR Committee may appoint a Specific Working Groups to develop such a procedure)*
	A4.2	Carry out studies on how to improve biosecurity in live animal markets and at farm level and how biosecurity can impact on stakeholders *The National PPR Committee may appoint Specific Working Groups to do this*
	A4.3	Carry out feasibility studies to implement an animal identification system
	A4.4	*Propose concrete amendments to update the existing legal framework conducive to supporting the new control measures foreseen in Stage 4 (compensation scheme, biosecurity, animal identification); in addition, legal provisions for suspending/stopping the vaccination are also included*

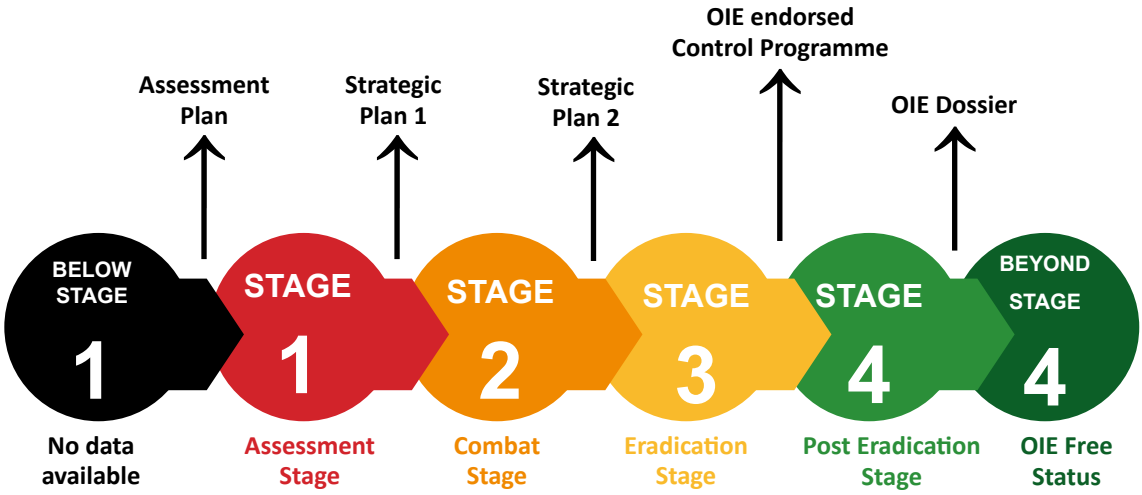
Outcome 5 (Stakeholder Involvement) Stakeholders are actively consulted for the compensation arrangements and are involved in the identification of their animals. Stakeholder involvement at this Stage is essential and, as in the previous stages, there is sufficient evidence that stakeholders have been duly involved in sharing control programme overall outcomes and that they have been part of the decision process to move towards eradication. Communication continues to be a key element.	A5.1	Establish a specific procedure (by the National PPR Committee) to address issues raised by a specific group of stakeholders concerning matters relating to PPR control/eradication that may impact on their business activities
	A5.2	Address specific requests from stakeholders (by the National PPR Committee, with the possible support of Working Groups)
	A5.3	Distribute communication material, use media and other oral means and organise specific meetings aimed at updating all stakeholders, including development partners active in the field (e.g. NGOs), where the country stands in its national efforts towards eradication and ensure their full and sustained support

The PMAT can be used either for self-assessment by the country or for independent assessment by external experts (country visits) at the request of the country. The results of the assessments can be reviewed and discussed during regional coordination meetings/roadmap and annual regional GF-TADs meetings.

An overview of the strategy stages and major features is shown in the figure below[5].

[5] *Adopted from the Global PPR Strategy for the Pan African PPR Strategy 2015*

An overview of the strategy stages and major features is shown in the figure below .



Focus Statge 1: To gain a better understanding on the presence of PPR	Assessment Stage	Focus Statge 2: To control both PPR clinical diseases and infection in a specific zone or production system	Combat Stage	Focus Statge 3: To achive PPR eradication throughout the national territory	Eradicatiostage	Focus Statge 4: To build evidence that these is no clinical disease nor virus circulation	Post Eradication Stage
	Outcome 1 (diagnostics)		Outcome 1 (diagnostics)		Outcome 1 (diagnostics)		Outcome 1 (diagnostics)
	Outcome 2 (survailance)		Outcome 2 (survailance)		Outcome 2 (survailance)		Outcome 2 (survailance)
	Outcome 3 (survailance)		Outcome 3 (P&C)		Outcome 3 (P&C)		Outcome 3 (P&C)
	Outcome 4 (P&C)		Outcome 4 (P&C)		Outcome 4 (P&C)		Outcome 4 (P&C)
	Outcome 5 (Legal Frame-work)		Outcome 5 (Legal Frame-work)		Outcome 5 (Stakeholders)		Outcome 5 (Stakehold-ers)
	Outcome 6 (Stakeholders)		Outcome 6 (Stakeholders)				

Adopted from the Global PPR Strategy for the Pan African PPR Strategy 2015

Annex 3: OIE Critical Competences and the Targeted OIE PVS Level of Advancement

Stage 1

OIE PVS CRITICAL COMPETENCIES		TARGETED OIE PVS LEVEL OF ADVANCEMENT	
CC I.2.A	Professional competencies of veterinarians	3	The veterinarians' practices, knowledge and attitudes usually allow undertaking all professional/technical activities of the VS (e.g. epidemiological surveillance, early warning, public health, etc.).
CC I.3	Continuing education (CE)	3	The VS have access to CE that is reviewed annually and updated as necessary, but it is implemented only for some categories of the relevant personnel.
CC II.1.A	Veterinary laboratory diagnosis – Access to veterinary laboratory diagnosis	2	For major zoonoses and diseases of national economic importance, the VS have access to and use a laboratory to obtain a correct diagnosis.
CC II.1.B	Veterinary laboratory diagnosis – Suitability of national laboratory infrastructures	3	The national laboratory infrastructure generally meets the needs of the VS. Resources and organisation appear to be managed effectively and efficiently, but their regular funding is inadequate to support a sustainable and regularly maintained infrastructure.
CC II.3	Risk analysis	3	The VS compile and maintain data and have the capability to carry out risk analysis. The majority of risk management measures are based on risk assessment.
CC. II.5.B	Epidemiological surveillance and early detection – Active epidemiological surveillance	3	The VS conduct active surveillance in compliance with scientific principles and OIE standards for some relevant diseases, apply it to all susceptible populations, update it regularly and report the results systematically.
CC III.2	Consultation with interested parties	3	The VS maintain a formal consultation mechanism with interested parties.
CC III.3	Official representation	3	The VS actively participate in the majority of relevant meetings.
CCIII.4	Accreditation / authorisation / delegation	3	The public sector of the VS develops accreditation/authorisation /delegation programmes for certain tasks, but these are not routinely reviewed

Stage 2

OIE PVS CRITICAL COMPETENCIES		TARGETED OIE PVS LEVEL OF ADVANCEMENT	
CC I.1.A	Professional and technical staffing of the VS – Veterinarians and other professionals	3	The majority of veterinary and other professional positions are occupied by appropriately qualified personnel at local (field) levels
CC I.1.B	Professional and technical staffing of the VS – Veterinary para-professionals and other technical staff	3	The majority of technical positions at local (field) levels are occupied by personnel holding appropriate qualifications
CC I.2.B	Competencies of veterinary para-professionals	3	The training of veterinary para-professionals is of a uniform standard that allows the development of only basic specific competencies
CC I.6.A	Coordination capability of the VS – Internal coordination (chain of command)	3	There are internal coordination mechanisms and a clear and effective chain of command for some activities
CC I.6.B	Coordination capability of the VS – External coordination	3	There are formal external coordination mechanisms with clearly described procedures or agreements for some activities and/or sectors
CC I.7	Physical resources	3	The VS have suitable physical resources at national, regional and some local levels and maintenance and replacement of obsolete items occurs only occasionally
CC I.8	Operational funding	4	Funding for new or expanded operations is on a case-by-case basis, not always based on risk analysis and/or cost benefit analysis.
CC I.11.	Management of resources and operations	4	The VS regularly analyse records and documented procedures to improve efficiency and effectiveness
CC. II.5.A	Epidemiological surveillance and early detection – passive epidemiological surveillance	3	The VS conduct passive surveillance in compliance with OIE standards for some relevant diseases at the national level through appropriate networks in the field, whereby samples from suspected cases are collected and sent for laboratory diagnosis with evidence of correct results obtained. The VS have a basic national disease reporting system.

CC II.7	Disease prevention, control and eradication	3	The VS implement prevention, control or eradication programmes for some diseases and/or in some areas with scientific evaluation of their efficacy and efficiency
CC II.8.B	Ante- and post mortem inspection at abattoirs and associated premises	4	Ante- and post mortem inspection and collection of disease information (and coordination, as required) are undertaken in conformity with international standards for export premises and for all abattoirs producing meat for distribution in the national and local markets
CC III.1	Communication	4	The VS contact point for communication provides up-to-date information, accessible via the Internet and other appropriate channels, on activities and programmes.
CC III.6	Participation of producers and other interested parties in joint programmes	3	Producers and other interested parties are trained to participate in programmes and advise of needed improvements, and participate in early detection of diseases.

Stage 3

OIE PVS CRITICAL COMPETENCIES		TARGETED OIE PVS LEVEL OF ADVANCEMENT	
CC II.2	Laboratory quality assurance	2	Some laboratories used by the public sector VS are using formal QA systems
CC II.12.A	Identification and traceability – Animal identification and movement control	3	The VS implement procedures for animal identification and movement control for specific animal subpopulations as required for disease control, in accordance with relevant international standards

Stage 4

OIE PVS CRITICAL COMPETENCIES		TARGETED OIE PVS LEVEL OF ADVANCEMENT	
CC I.9	Emergency funding	4	Funding arrangements with adequate resources have been established, but in an emergency situation, their operation must be agreed through a non-political process on a case-by-case basis
CC II.4	Quarantine and border security	3	The VS can establish and apply quarantine and border security procedures based on international standards, but the procedures do not systematically address illegal activities relating to the import of animals and animal products
CC II.6	Emergency response	4	The VS have an established procedure to make timely decisions on whether or not a sanitary emergency exists. The VS have the legal framework and financial support to respond rapidly to sanitary emergencies through a chain of command. They have national contingency plans for some exotic diseases that are regularly updated/tested
CC IV.6	Transparency	3	The VS notify in compliance with the procedures established by the OIE (and the WTO SPS Committee where applicable)

Annex 4: Correlation between PPR Stages and OIE PVS Critical Competences level of Advancement

OIE PVS Critical Competences / PPR Stages		Stage 1 (Assessment)	Stage 2 (Control)	Stage 3 (Eradication)	Stage 4 (Post-eradication)
CC I.2.A	Professional competencies of veterinarians	3			
CC I.3	Continuing education (CE)	3			
CC II.1.A	Veterinary laboratory diagnosis – Access to veterinary laboratory diagnosis	2			
CC II.1.B	Veterinary laboratory diagnosis – Suitability of national laboratory infrastructures	3			
CC II.3	Risk analysis	3			
CC II.5.B	Epidemiological surveillance and early detection – active epidemiological surveillance	3			
CC III.2	Consultation with interested parties	3			
CC III.3	Official representation	3			
CC III.4	Accreditation / authorisation / delegation	3			
CC III.5.A	Veterinary Statutory Body – authority	3			
CC III.5.B	Veterinary Statutory Body – capacity	3			
CC IV.1	Preparation of legislation and regulations	3			
CC I.1.A	Professional and technical staffing of the VS – Veterinarians and other professionals		3		
CC I.1.B	Professional and technical staffing of the VS – Veterinary para-professionals and other technical staff		3		
CC I.2.B	Competencies of veterinary para-professionals		3		
CC I.6.A	Coordination capability of the VS – Internal coordination (chain of command)		3		
CC I.6.B	Coordination capability of the VS – External coordination		3		
CC I.7	Physical resources		3		
CC I.8	Operational funding		4		
CC I.11.	Management of resources and operations		4		

CC. II.5.A	Epidemiological surveillance and early detection – passive epidemiological surveillance		3		
CC II.7	Disease prevention, control and eradication		3		
CC II.8.B	Ante- and post mortem inspection at abattoirs and associated premises		4		
CC II.12.A	Identification and traceability – Animal identification and movement control		3		
CC III.1	Communication		4		
CC III.6	Participation of producers and other interested parties in joint programmes		3		
CC IV.2	Implementation of legislation and regulations and compliance thereof		3		
CC IV.7	Zoning		3		
CC II.2	Laboratory quality assurance			2	
CC II.12.A	Identification and traceability – Animal identification and movement control			3	
CC I.9	Emergency funding				4
CC II.4	Quarantine and border security				3
CC II.6	Emergency response				4
CC IV.6	Transparency				3



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