ICPALD

The PPR Control and Eradication Program for IGAD region

Five Years program (2017-2021)

EUROPEAN UNION

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ACRONYMS

AGDP	Agricultural Gross Domestic Product
AU-IBAR	African Union – Inter African Bureau for Animal Resources
AU-PANVAC	African Union – Pan African Vaccine Centre
CAHWs	Community Animal Health Workers
CCPP	Contagious caprine pleuro-pneumonia
CCs	Critical Competencies
CELISA	Competitive ELISA
CIRAD	Centre for International Cooperation in Agronomic Research for Development
CVO	Chief Veterinary Officer
ELISA	Enzyme-linked immune-sorbent assay
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FMD	Foot and Mouth Disease
GALVMED	Global alliance for Livestock Veterinary Medicines
GCEP	Global Control and Eradication Programme
GCES	Global Control and Eradication Strategy
GF-TADs	Global Framework for the Progressive Control of Transboundary Animal Diseases
GREP	Global Rinderpest Eradication Programme
IAEA	International Atomic Energy Agency
ICE	Immune-capture ELISA
ICPALD	the IGAD Centre for Pastoral Areas and Livestock Development
IGAD	Inter-Governmental Authority on Development
ILRI	International Livestock Research Institute
ISO	International Standard Organization
M&E	Monitoring & Evaluation
MS	Member States
NGO	Non-Governmental Organisation

NSP	National Strategic Plan
OIE	World Organisation for Animal Health
PCR	Polymerase Chain Reaction
PDS	Participatory Disease Search
PE	Participatory epidemiology
PES	Pneumo Enteritis
PMAT	PPR Monitoring and Assessment Tool
PME	Participatory Monitoring and Evaluation
PMU	Project Management Unit
PPR	*Peste des petits ruminants*
PPR-GCES	PPR Global Control Eradication Strategy
PPRV	PPR virus
PVE	Post Vaccination Evaluation
PVS	Performance of Veterinary Services (OIE tool)
REC	Regional Economic Commission
RT-PCR	Real-time Polymerase Chain Reaction
RVF	Rift Valley Fever
SDGs	Sustainable Development Goals
SERECU	Somali Ecosystem Rinderpest Eradication Coordination Unit
SGP	Sheep pox & goat pox
SHARE	Supporting Horn of Africa Resilience (*European Union initiative*)
SOP	Standard Operation Procedures
SPS	Sanitary and Phyto-sanitary Standards
SR	Small ruminants
SRD	Small ruminant diseases
TADs	Transboundary animal diseases
TOR	Term of Reference
ToT	Training of trainers
VACNADA	Vaccine for the Control of Neglected Animal Disease in Africa
VET-GOV	Reinforcing Veterinary Governance in Africa
VLSP	Veterinary Legislation Support Programme
VS	Veterinary Services

EXECUTIVE SUMMARY

Peste des petits ruminants (PPR) is a major constraint to the livelihoods and food security of small scale farmers in the IGAD region. The adverse socio-economic impacts of PPR are significant, particularly in the IGAD region where the livestock sector shapes prospects for economic growth, poverty alleviation and food security. The impact of PPR falls disproportionately on the poor populations, in the form of production and marketing losses, reductions in household income and hinders the attainment of the *Sustainable Development Goals (SDG)*.

There are multiple compelling reasons to start a concerted effort on PPR with some urgency, among which the need to rapidly stop the spread of the disease in already affected countries and at-risk regions, the urgent need to mitigate the economic impact of the disease on people relying on small ruminants for subsistence, the momentum that was created with the eradication of rinderpest, the invaluable lessons that have been learned during the progressive control and eradication of rinderpest that resulted in a growing interest among the international community to address PPR at a regional and global scale.

This programme document presents a plan for the step-wise control of PPR that builds upon the lessons learnt from rinderpest eradication. It is aligned with the PPR Global Control and Eradication Strategy which has the ultimate goal of a World free of PPR by 2030. The programme stems also from various continental and regional strategies including Pan African Strategy for the Progressive Control of Peste des Petits Ruminants (Pan African PPR strategy) and the IGAD Regional Peste des Petits Ruminants (PPR) Progressive Control and Eradication Strategy.

- ***General objective:***

  The general objective of the program is to enhance the contribution that the small ruminant sector makes to food security and nutrition, human health and economic growth, in IGAD region, thereby reducing poverty, increasing resilience and income generation and improving the livelihoods of smallholder farmers and general human wellbeing.

- ***Specific Objective of the program in the coming five years***

  - For all IGAD MS to lay the foundations for and commence the eradication of PPR by

    i. Developing capacity;

    ii. Understanding the epidemiological situation at national, regional level; and

    iii. Defining high risk zones and implementing appropriate strategies/interventions at country/ecosystem level well-coordinated and harmonized by IGAD, so as to reduce the incidence of PPR in the endemic and prevent further spread in the free areas.

    iv. By 2021, 75% of countries will be in stage 3 and the remaining 25% in stage 2.

The PPR Global Strategy foresees three 5-year phases. The IGAD sub-regional Step-wise PPR control programme will be carried out in the first five years. Subsequent phases will be developed in light of lessons learned and achievements made during the first phase. By the end of this phase 75% of IGAD MS will be in stage 3 while the remaining 25% in stage 2. The programme is a highly ambitious one and, given its complexities, must be viewed as a long-term activity that requires ongoing political, community and funding commitments and professionalism to achieve success.

This five year programme highlights the technical and policy tools foreseen as appropriate to control PPR in infected countries. It defines actions and activities that need to be implemented from the

sub-regional to community levels and thereby lays the foundations for and commencement of PPR eradication by reducing the prevalence of PPR in infected countries. The programme will also develop capacity of non-infected countries to demonstrate the absence of PPR virus (PPRV) in small ruminants and move towards OIE official free status. The programme will also support reducing the prevalence of other prioritized small ruminant diseases and the strengthening of national Veterinary Services, using the OIE PVS Tool as a basis for building capacity related to critical competencies within those Veterinary Services that will support successful implementation of the GCEP.

The programme will be implemented over a 5 year period from 2017 – 20121. The impacts anticipated from this programme are expected to contribute to the larger goal of reducing poverty in poor livestock farming communities in the IGAD MS. The following major outcomes are expected from the programme implementation.

1. Surveillance and laboratory capacity for early detection and diagnosis of PPR built;
2. Status of the disease in MS defined and clear intervention plan developed/ updated (Epidemiological assessment);
3. PPR Prevention and control capacity built, implemented and incidence of the disease reduced;
4. Stronger veterinary services in support of PPR control and eradication built;
5. Functional coordination framework for the control and eventual eradication of PPR established.

Due to its highly infectious nature, PPR can spread very rapidly. In the IGAD sub-region where countries generally have contiguous borders and regular cross-border movements of people and goods, it is very difficult for countries to prevent the transboundary spread of PPR to other countries when outbreaks occur. Control and eradication planning of PPR therefore requires a coordinated approach, recognizing that individual countries have the responsibility and accountability for managing their own programmes.

The programme seeks to coordinate PPR and other SRD control activities between IGAD countries, provide technical advice, ensure coherent regional strategies and enlist political and resource support to achieve its stated objectives. It serves as a model for regional coordination, not only for PPR, but also for a range of other diseases of transboundary nature. Coordination facilitates the development of coherent strategies, standards, disease control approaches, training, improved communications, the provision of advice and establishment of laboratory and epidemiological networks. More efficient linkages and working arrangements with other funded projects will be pursued to increase the prospects of achieving objectives. IGAD-ICPALD will play a major coordination role at sub-regional level. Technical support will be enlisted from AU-IBAR, AU-PANVAC, OIE and FAO.

Each country will establish a National PPR committee to facilitate consultation and promote stakeholder engagement. A PPR national coordinator will be appointed by the relevant Ministry to oversee the programme implementation at country level. The programme will support coordination meetings between central and decentralized VS, including farmers, private partners, civil society and others. Country representatives will be invited to participate in Regional PPR coordination committee, epidemiology and laboratory networks activities. Collaboration between neighbouring countries will be promoted to develop and implement a harmonized transboundary epizone approach to PPR eradication.

The PPR Global Control and Eradication Strategy (PPR GCES) will inform the approach to be followed in implementing the programme. It comprises a multi-stage, multi-country process involving assessment, control, eradication and maintenance of PPR virus free stages (stages 1-4). The four stages correspond to decreasing levels of epidemiological risk and increasing levels of prevention

and control. The PPR Monitoring and Assessment Tool (PMAT), a companion tool to the GCES will be used by MS to make self-assessments of their current stages. The PMAT gives guidance and milestones to PPR-endemic countries based on epidemiological and activities-based evidence. PMAT also measures activities and their impacts in each stage. At country level, the PPR status will be updated using the PMAT. This will also help to determine the progression toward final eradication. An ecosystem approach with enhanced coordination and harmonization of activities together with regular exchange of information between veterinary services of neighboring countries is to be encouraged.

At the technical level, improved surveillance, early detection, reporting and rapid response with the identification of foci of infection will be pursued, particularly at farmer and community levels. Biosecurity will be reinforced and disease management improved with the objective of eliminating the virus. Importantly, PPR incidence will be reduced by targeting PPR at source and along risk movement pathways which will continue to be studied. Control zones will be established when the incidence of PPR has decreased to low levels and the likelihood of further outbreaks reduced. Zones or countries free of PPR will focus on quarantine and emergency disease preparedness in the event of an outbreak.

Vaccination will play a pivotal role in the PPR control programme. Key to success will be substantially increased vaccination in areas where PPR occurs. Vaccination will also be performed in emergency situations utilizing the regional PPR Vaccine Bank to be established under this programme. The program will conduct Post-Vaccination-Evaluation (PVE) with collection of data for evaluating the results of the vaccination programme and monitor the whole vaccination chain accordingly. PVE can contribute to the overall assessment of vaccine effectiveness, which encompasses the vaccine attributes and its delivery, vaccination coverage and immune response to vaccination. All batches of vaccine used in the programme will be submitted to PANVAC for quality certification.

From an economic assessment done at the global level there is evidence that the eradication programme will be economically profitable when compared to the alternative of continuing with uncoordinated control efforts. The total program cost is in the range of 164.5 million USD over a five year period. It is important to note that the major costs of strengthening Veterinary Services and combining with other diseases has not been included in this programme. The support to Veterinary Services is the subject of specific investments after countries have evaluated their needs, particularly through the use on a voluntary basis of the PVS Gap Analysis tool. The cost of combating other diseases in combination with PPR control and eradication activities is extremely difficult to estimate since the list of priority diseases to be addressed will be defined after discussions to be held during regional and national workshops and subsequent definition of specific control strategies against other diseases.

Substantial benefits to the region will accrue from a successful programme to control and eradicate PPR. This will enable the IGAD Countries to increase livestock production and productivity, processing and marketing, particularly the access to international markets for livestock and livestock products. It will also increase income at local level thereby directly contributing to poverty reduction and improved living standards.

Advocacy with the donor community and countries will be needed to obtain funding for vaccination in the resource-constrained countries and for general assistance with PPR activities. Ongoing efforts will be made to meet decision-makers and to prepare briefings for such meetings, and to enlist the support of governments, development partners and industry. Increased emphasis will be placed on public awareness activities and mobilizing stakeholder and public support and engagement in the program.

INTRODUCTION

The Intergovernmental Authority on Development (IGAD) is one of the trade blocks or economic communities in Africa. It is formed by membership of eight countries in the horn of Africa; namely Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan and Uganda. The sub-region has total land area of 5.2 million square kilometers accounting for 17.2 % of Africa. The total population of IGAD member countries in 2016 is estimated at 242 million (23.5 % of Africa). The sub-region has great variety of climates and landscapes including mountains, glaciers, tropical forests and grasslands as well as arid and semi-arid areas among others. The arid and semi-arid lands account for over 80 % of the land mass in the region.

The economic mainstay of the sub-region is agriculture. Livestock and crop production provides the basis for food supplies and export earnings, as well as employment for over 80 percent of the population. Within the Agriculture sector a large contribution, on average 57 percent comes from livestock. Livestock play a major role in the livelihoods of over 70% of the population[1].

With an estimated 242 million small ruminants raised in the IGAD sub-region, and IGAD exporting over 10 million small ruminants to the Middle East annually[2]. the importance of small ruminant production as a form of commercial livestock production can hardly be underestimated. Small ruminants provide with a vast range of products and services, including milk, meat, skins, and wool throughout the year. They are cheaper to buy compared to larger animals, they reproduce rapidly and are easily sold for cash or exchanged for other staples. In addition to this, they adapt well to pastoralist and agro-pastoralist ecological systems common in the Horn of Africa. Due to this, women and disadvantaged households often rely on them. They are an important means to rebuild herds after environmental and political shocks. Thus, small ruminants are an important component of coping mechanism.

Globally, given the increase in population, income growth and urbanization, between 2000 and 2030, annual mutton consumption is expected to increase by over 7 million metric tons, with fastest growth expected in developing countries. In sub-Saharan Africa (SSA), annually, it is expected to increase by 1.8 million metric tons and most of it is anticipated to be supplied from the IGAD region. Second only to poultry, this fast growing demand for meat and milk from small ruminants represents an important growth area. This increase in demand will generate new opportunities for value chain actors[3].

Currently, the productivity of the stock is reduced and the ability of livestock value chain actors to exploit the above mentioned opportunities is limited due to numerous challenges, including high prevalence of high impact animal diseases. Among these diseases, Peste des petits ruminants (PPR) is causing significant losses to small ruminants in many parts of the sub region. In the past two decades, PPR has spread rapidly in the sub-region and has caused and is causing enormous losses. In the 2006–2011 outbreaks in Kenya, Tanzania and Uganda a morbidity rate as high as 73 % was reported with severe impacts on livelihoods. The outbreaks resulted in better-off households slipping into poverty, while the poor and very poor became impoverished. In Kenya, an estimated livestock asset loss due to 2 years of PPR virus circulation ranged from 52 to 68 %, 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

1 FAO STAT (2013).

2 IGAD (2016). – Training Manual to Enhance the Capacity of Trade Counselors of IGAD Member States Working in the Middle East and North African Countries

3 Robinson T.P. & Pozzi F. (2011). - Mapping supply and demand for animal-source foods to 2030. FAO, Animal Production and Health Working Paper. No. 2. Rome.

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[4] (FAO, 2009). 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. Investing in PPR control and eradication is seen as key to food security and poverty reduction in the world's most vulnerable communities in the IGAD sub region and will, therefore, directly benefit the livelihoods and stability of millions of pastoralists and livestock smallholders in affected countries.

Global consensus to control and eradicate PPR was built at the Abidjan Conference which was organized by FAO and OIE and where a PPR Global Control and Eradication Strategy (PPR -GCES) was endorsed. In line with global program, the IGAD sub-region has developed a strategy for the control and eradication of PPR from the sub region. This five year program is developed to translate the strategy into action and covers only the first phase of the program which will lay the foundations for and commence the eradication of PPR in the sub region.

This five year program highlights the technical and policy tools foreseen as appropriate to eradicate PPR in infected countries. It defines outcomes, outputs, and activities that need to be implemented from the sub-region to community levels and thereby lays the foundations for and commencement of PPR eradication by reducing the prevalence of PPR in infected countries. The program will also support reducing the prevalence of other prioritized small ruminant diseases and the strengthening of national Veterinary Services.

4 FAO (2009). - The Impact of Peste des Petits Ruminant on Livelihoods in the Arid and Semi-Arid Lands of Kenya. ECTAD-Nairobi Working Paper 2012.

PART 1: RATIONALE FOR THE CONTROL AND ERADICATION OF PESTE DES PETITS RUMINANTS

1.1. Importance of small ruminants

Livestock play a major role in the livelihoods of over 70% of the population in the IGAD. With an estimated 242 million small ruminants raised in the IGAD Region,, the importance of small ruminant production as a form of commercial livestock production can hardly be underestimated. Small ruminants provide with a vast range of products and services, including milk, meat, skins, and wool throughout the year. They are cheaper to buy compared to larger animals, they reproduce rapidly and are easily sold for cash or exchanged for other staples. In addition to this, they adapt well to pastoralist and agro-pastoralist ecological systems common in the Horn of Africa. Due to this, women and disadvantaged households often rely on them. They are an important means to rebuild herds after environmental and political shocks. Thus, small ruminants are an important component of pastoral coping mechanism.

Human population growth in the IGAD region is forcing the conversion of many former grazing areas into croplands needed for increased food production. Raising large ruminants is becoming increasingly difficult as a result of the ensuing lack of grazing areas. Land holdings in densely populated areas are small. In such places, the importance of sheep and goats in fulfilling the role once played by cattle for meat, milk and manure production is being increasingly recognized. The increased demand for sheep and goat meat has also increased their importance in lowland pastoral areas as a source of cash income, food security, etc. They provide their owners with a vast range of products and services such as meat, milk, skin, manure etc.

In the subsistence sector, farmers and pastoralists depend on small ruminants for much of their livelihood, often to a greater extent than on cattle, because sheep and goats are generally owned by the poorer sectors of the community. Women often have access to and control over small ruminants making it an important resource for them. However, when they lose their small ruminants, they fall out of livestock production and are led to migrate to the cities where they experience peri-urban poverty, overcrowding and sedentary lifestyles. As a result, they contribute to environmental degradation and unsustainable land use as they turn to the selling of firewood, grass and charcoal. Any intervention that improves the productivity of sheep and goats is important in creating wealth and improving the standard of living of resource-poor farmers. The short generation interval of sheep and goats coupled with high frequency of multiple births allow for rapid increases in animal numbers. This builds financial capital and allows the sale of surplus animals for cash that can be used for other agricultural enterprises, school fees, medical bills, etc.

Sheep and goats are relatively cheap and are often the first asset acquired, through purchase or customary means, by a young family or by a poor women headed family recovering from a disaster such as drought or war. Being relatively tolerant to drought, goats can survive on woody browse and infrequent watering. Their fast reproduction rate enables their owners to recover quickly, following a drought. Very often, there are no banking facilities in rural areas and an easy way to store cash for future needs is through the purchase of sheep and goats. In fact, in some areas, small ruminants have been described as the 'village bank'. It has to be noted that this is beyond the cash value of the animal.

The IGAD region is known for its vast livestock resource especially small ruminants. It is one of the regions with the highest ruminant livestock concentration in the world. It is also close to the major livestock markets, Middle East and North African (MENA) countries. Annually millions of small ruminants and substantial volume of meat is exported to MENA earning MS foreign currency to

support their economic development. Globally the demand for livestock and products is growing fast, even faster than most other agricultural commodities. This is mainly attributed to human population growth, income growth and urbanization. This growth in demand is projected to continue for the coming fifty years. This creates great opportunity for IGAD MS.

The above-mentioned dynamics mean that small ruminants play a vital role in rural areas and the overall development of IGAD MS. The entry or presence of any small ruminant disease within these settings can be devastating for the livelihoods and resilience of these communities.

1.2 Peste des petits ruminants, the disease and its impact

Peste des petits ruminants (PPR), first reported and described in 1942 in Côte d'Ivoire, is a highly contagious disease of wild and domestic small ruminants. It is caused by a virus that belongs to the genus *Morbillivirus* in the family Paramyxoviridae. PPR occurs in a band that spreads across Africa between the equator and the Sahara and south to Gabon, through the Arabian Peninsula, the Middle East, West Asia, India and China. The disease has not occurred in the Western hemisphere, Australasia and Oceania. All the IGAD Member States have reported PPR except Djibouti.

PPR is regarded the most economically important viral disease of sheep and goats in Africa, the Middle East and Asia. The number of outbreaks reported to the OIE has increased dramatically over the past decade or so. Over the past years, PPR has been expanding southwards, and is now well established in Tanzania and is reported to have reached northern Zambia and Mozambique. Endemic throughout western Africa PPR has spread to Morocco (in 2008) and other countries (Algeria and Tunisia) in North Africa; it now poses a threat to southern Europe. In a similar fashion, PPR spread over much of Asia and the Middle East in recent decades.

PPR is a dangerous and costly disease for small ruminant populations. As a disease of small ruminants, the severity of PPR impacts depends on the complex roles played by small ruminants and epidemiological status of the disease. The socio-economic losses associated with PPR mainly result from the high case fatality rates. In naïve population, such as was the case in the 2006–2011 outbreaks in Kenya, Tanzania, Uganda, and DR Congo, morbidity as high as 73 % was reported with severe impacts on livelihoods. The outbreaks resulted in better-off households slipping into poverty, while the poor and very poor became impoverished. 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).

The overall annual losses due to mortality range from 12-14% in sheep and 11-13% in goats. These figures are even much higher for lambs and kids. Although there are very few studies done on the economic losses caused by PPR, a small participatory epidemiological study conducted by FAO Ethiopia5 indicated that the annual losses due to mortality alone in the PPR endemic areas of Somali Region are about ten per cent of the goat population. Information from recent epidemic outbreaks in newly infected areas indicates that mortality is much higher in that circumstance with mortality sometimes reaching 90 per cent or more.

A detailed post-epidemic socio economic study of the PPR outbreak in Turkana estimated morbidity levels of 73-75% and a case fatality rate of 78-80% in infected flocks. The total number of small ruminants that died in Turkana was estimated at over 1 million. The study examined the effects of PPR on four wealth-category strata of Turkana households, from poorest to "well off". It showed that PPR was catastrophic for the "very poor" and "poor" categories, with estimated income losses of 100% and 97% respectively, and impoverishing for "middle" and "better off" categories with estimated losses of 54% and 42% respectively. Effectively, the disease pushed the poorest families

into destitution or near destitution and the higher wealth category families down one or two classes into poverty. 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.

From experience of the trade bans imposed by Middle-Eastern countries on livestock and livestock products from the Horn of Africa due to two successive *Rift Valley Fever (RVF)* outbreaks in 1998-1999 and 2000-2002, the impact of PPR on international small ruminant trade could be substantial. Small ruminants contribute more than 80% of the livestock export from the IGAD region. Prior to the 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. 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 ban respectively. A loss of $132 million in value added and 36% fall of GDP was estimated in Somali region of Ethiopia due to trade ban imposed as a result of the outbreak of RVF in Northern Somalia and Kenya in 2000.

1.3. Justification and feasibility

There are multiple compelling reasons to start a concerted effort on PPR control and eradication with some urgency, among which the need to rapidly stop the spread of the disease in already affected countries and at-risk regions, the urgent need to mitigate the economic impact of the disease on people relying on small ruminants for subsistence, the momentum that was created with the eradication of rinderpest, the invaluable lessons that have been learned during the progressive control and eradication of rinderpest that resulted in a growing interest among the international community to address PPR at a regional and global scale.

As was the case with rinderpest, several technical factors favor the prospect of achieving global eradication of PPR virus. These include:

- Availability of highly efficacious, single shot, safe and affordable vaccines that confer several years of immunity against all strains of PPR virus.
- Possibility of producing vaccines that can better withstand hotter climates ensuring ease of delivery to remote farming and pastoral communities.
- Existence of numerous producers of quality vaccines in the IGAD region and the rest of Africa.
- Absence of a carrier state of any known reservoir of the virus outside the domestic small ruminant population.
- Availability of appropriate diagnostic tests and protocols for surveillance and monitoring of small- and large-scale control and eradication program.
- Presence of laboratory and epidemiological networks in several regions.
- High-level commitment and compliance for PPR vaccination expected from farmers and extension workers.
- Growing political will from international/regional institutions and countries as evidenced by the launch of many PPR control projects in the past five years. The most recent one being the EU SHARE project currently under implementation in some of the countries in the IGAD region (Djibouti, Ethiopia and Kenya).

At a regional level, the greater Horn of Africa collectively exports several million live animals annually to the Arabian Peninsula. Along with geographical distribution, there is a marked increase in demand for mutton meat. In sub-Sahara it is predicted that from 2000 to 2030 there will be an increase of consumption of mutton by 137% and for low income countries, mutton has a predicted increase of

177%, second to poultry, making it an important livelihood and food security asset that needs to be maintained and protected globally.

1.4. Lessons from the Rinderpest eradication

The Global Rinderpest Eradication Programme (GREP) resulted in recognition in 2011 that rinderpest virus had ceased to exist in both domesticated and wild ruminants. This remarkable achievement demonstrated that it was possible to eradicate an animal disease on a global scale – the first time this had been done. Fuelled to a great extent by this success there has been a burgeoning of interest in disease eradication and disease eradication scientists are keen to demonstrate that they have learnt lessons from the GREP to guide other initiatives.

A progressive control campaign based on repeated vaccination of all susceptible small ruminants is difficult and unaffordable. Therefore the use of epidemiological intelligence to initially target endemic populations and high-risk areas will be essential. Targeted approach to disease control is one of the major lessons from rinderpest campaign. Its advantage is that progress could be achieved in relatively short periods of time as was shown during the rinderpest eradication campaign in Ethiopia. It took in fact only 3 years for example to clear the Afar ecosystem from rinderpest, while noting that verification of its absence took longer. As small ruminants replace at a much faster rate, the verification of absence of disease will take a shorter time as compared to rinderpest.

The main lesson from GREP therefore relates to understanding that epidemiology is the key to disease eradication. It is also essential to understand by "epidemiological studies" that it is an active process which involves searching for disease not only through serological surveys. Disease surveillance is the discipline which is needed to inform epidemiological understanding. It takes many forms but for the purposes of eradication a combination of syndromic and participatory disease surveillance are the most informative disciplines. The use of participatory approaches to surveillance greatly enhanced the information base available to decision-makers for the targeting of control interventions. In fact, participatory disease surveillance (PDS) based on participatory rural appraisal evolved in response to the surveillance needs of the Pan African Rinderpest Campaign.

One of the lessons learnt from the global eradication of rinderpest was that effective coordination is instrumental for successful implementation of a disease control/eradication program. The targeted progressive control strategy will count on strong coordination mechanism between the countries in the region. The overall responsibility for coordination in the IGAD sub-region rests with IGAD, as a Regional Economic Commission (REC) with political mandate from member states and their populations to address critical sub-regional issues. Technical backstopping and services shall be provided by AU-IBAR, AU-PANVAC, FAO, IAEA, ILRI and OIE because of their mandates, resources, expertise and experience. These technical supports will be provided under the aegis of the Global Framework for the control of Transboundary Animal Diseases (GF-TADs) Africa.

Applying lessons learned from the rinderpest eradication campaign will therefore be of paramount importance and should allow any new campaign to take less time to achieve similar success with PPR.

1.5. Past related work to PPR

In the IGAD region most countries are infected and a regional strategy has been developed aimed at developing or improving a series of activities, including surveillance, diagnostic procedures, vaccination and awareness campaigns. Currently, prevention and control measures for PPR as well as other diseases are based on vaccination campaigns conducted mostly in response to disease outbreaks and hence are focused around the outbreak area (i.e. ring vaccination). Nevertheless,

mass PPR vaccination campaigns were conducted in Kenya in 2008/2009 and Somalia in 2012/2013. In 2012 a total of 19.6 million sheep and goats were vaccinated within a period of three months in Somalia. Recent experience with mass pulsed vaccination in southern and eastern Ethiopia has demonstrated the feasibility of rapid area-wide clearance of PPR virus infection. These campaigns were immediately successful in greatly reducing the incidence of PPR to a point approaching elimination giving confidence that concerted area-wide action could achieve eradication. The Nigeria 75/1 strain (produced in Ethiopia, Kenya and Sudan) was used in these vaccination campaigns.

AU-IBAR project, Vaccines for the Control of Neglected Animal Diseases in Africa (VACNADA), has managed to vaccinate millions of small ruminants in the IGAD region around 2011. The project's intervention was in response to soaring food prices to help the most vulnerable countries to move towards long-term food security through the reduction of the impact of animal diseases. It was regionally coordinated by AU-IBAR in close partnership with the African Union Pan African Veterinary Vaccine Centre (AU-PANVAC), the Global Alliance for livestock Veterinary Medicines (GALVmed), and centre for International Cooperation in Agronomic Research for Development (CIRAD) and the National Veterinary Authorities in the respective countries. Moreover, during the recent drought in the Horn of Africa, PPR vaccination programmes supported by ECHO project were implemented to support the livelihoods of poor pastoralists by ensuring that as many animals as possible were kept alive through preventive vaccination and therapeutic treatment of mainly small ruminants. This strategy was often referred to as "Restocking from within".

1.6. Veterinary Services

The effective control and eradication of PPR in each country will require well-functioning and well-resourced national Veterinary Services (VS), as key components of the control and eradication effort – risk analysis, disease surveillance, disease investigation, laboratory diagnosis, quality assurance of vaccines, effective vaccination campaigns, and post vaccination evaluation, among others, are primarily the responsibility of the national Veterinary Services. Thus, control programmes will be more effective and sustainable if they are based on efficient veterinary services that comply with the quality standards described in Chapters 3.1 and 3.2 of the OIE Terrestrial Animal Health Code and on strong partnership between stakeholders in both public and private sectors.

The OIE devotes two chapters of the OIE Terrestrial Animal Health Code (the Terrestrial Code) to the Quality of VS. The VS, as defined in the OIE Terrestrial Code, are comprised of public and private sector veterinarians and veterinary para-professionals. Compliance with these standards on quality provides a foundation for implementing all of the other provisions of the OIE Terrestrial Code. This will for example increase the credibility of VS' certification for international trade. On a more general note, the quality and good governance of VS create an 'enabling environment' for improving animal and public health and enhancing compliance with SPS standards, at the national, regional and international level.

The quality of the VS depends on a set of factors, which include fundamental principles of an ethical, organizational, legislative, regulatory and technical nature. The OIE PVS pathway is a global programme for the sustainable improvement of a country's Veterinary Services. This is a voluntary, comprehensive and multi-staged process which involves the systematic evaluation of VS with regard to international standards. It provides a number of useful standardized tools and activities for assessing the capacities of national VS against 47 Critical Competencies (CCs) of the national VS and ascribes an assessment level for each CC in the range of 1 (minimal compliance) to 5 (full compliance). 33 of the 47 CCs included in the PVS Evaluation were identified as useful indicators for monitoring the progressive development of national VS in support of the ultimate goal of achieving freedom from PPR.

PART 2: PROJECT DESCRIPTION

2.1 Programme Goal/objectives

- ***General objective:***

  The general objective of the program is to enhance the contribution that the small ruminant sector makes to food security and nutrition, human health and economic growth, in IGAD region, thereby reducing poverty, increasing resilience and income generation and improving the livelihoods of smallholder farmers and general human wellbeing.

- ***Specific Objective of the program in the coming five years***
  - For all IGAD MS except Djibouti to lay the foundations for and commence the eradication of PPR by

    i. Developing capacity;

    ii. Understanding the epidemiological situation at national, regional level; and

    iii. Defining high risk zones and implementing appropriate strategies/interventions at country/ecosystem level well-coordinated and harmonized by IGAD, so as to reduce the incidence of PPR in the endemic and prevent further spread in the free areas.

    iv. By 2021 50% of countries will enter stage 4 and the remaining 50% will enter in stage 3.

2.2 Approach

2.2.1 Delineating the roles and responsibilities of MS and Regional, continental and global institutions.

Each country will establish a National PPR committee to facilitate consultation and promote stakeholder engagement. A PPR national coordinator will be appointed by the relevant Ministry to oversee the programme implementation at country level. The programme will support coordination meetings between central and de-concentrated/decentralized VS, including farmers, private partners, civil society and others. Country representatives will be invited to participate in regional coordination committee, epidemiology and laboratory networks activities. Collaboration between neighbouring countries, to develop and implement a harmonized transboundary epizone approach to PPR eradication, will be promoted.

Regular meetings will be convened with the IGAD Member States for harmonization and coordination of interventions and approaches. The recently established IGAD *Coordination Committee* for the Control of PPR and other TADs, together with its technical committee will take on this role. Thematic networks covering different aspects of the strategy will be supported under the coordination of IGAD-ICPALD. Technical support will be enlisted from AU-IBAR, AU-PANVAC, OIE FAO, IAEA and ILRI for the implementation of the activities of the networks.

At global level, the PPR Secretariat is responsible for the overall management of the programme and its implementation, assessment, refinement and reporting.

2.2.2 Stepwise approach and Self-assessment using PMAT

The PPR Global Control and Eradication Strategy (PPR GCES) details how the programme will operate. The PPR GCES comprises a multi-stage, multi-country process involving assessment, control, eradication and maintenance of PPR virus free stages (stages 1-4 below). Implementation requires the concerted delivery of preparedness plans, capacity building, stakeholder awareness and engagement; as well as establishment of a legal framework.

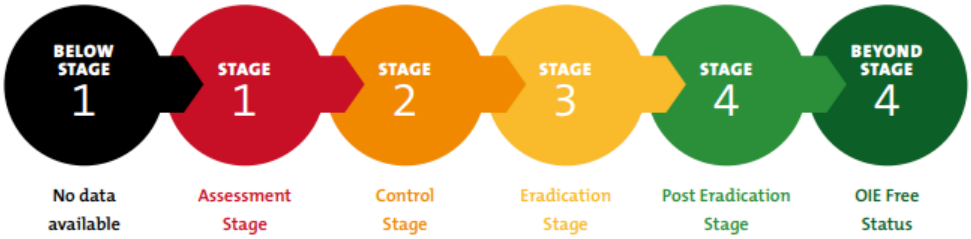


Figure X: The four stages correspond to decreasing levels of epidemiological risk and increasing levels of prevention and control.

Stage 1: the epidemiological situation is being assessed

Stage 2: the control activities are implemented including vaccination

Stage 3: PPR is being eradicated

Stage 4: 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. To enter stage 4 vaccination must be suspended.

Regardless of the stage in which a country initially places itself, sufficient capacity should be achieved relative to 5 key elements so that the country can move with confidence to the next stage of control and eradication. These five technical elements are:

- PPR diagnostic system
- PPR surveillance system
- PPR prevention and control system
- Legal framework for PPR prevention and control system
- Stakeholders' involvement on PPR prevention and control.

The PPR Monitoring and Assessment Tool (PMAT), a companion tool to the GCES was presented to countries/territories during the regional roadmap meetings, and used successfully by them to make self-assessments of their current stages. The PMAT also guides and facilitates the countries/ territories that have embarked on prevention and control. It gives guidance and milestones to PPR-endemic countries based on epidemiological and activities-based evidence. PMAT also measures activities and their impacts in each stage. At country level, the PPR status will be updated using the PMAT. This will also help to determine the progression toward final eradication.

2.2.3 Epi-zone approaches

An ecosystem approach with enhanced coordination and harmonization of activities together with regular exchange of information between 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. For the *ad hoc,* an ecosystem is a defined geographical area/ zone occupied by one or more closely related ethnic communities and their livestock and adjacent areas into which these animals are moved for pasture or trade purposes. The livestock population in such an area therefore constitutes a continuum that is epidemiologically uniform, regardless of the national boundaries. Possible ecosystems include the Somali Ecosystem (Djibouti, Ethiopia, Kenya and Somalia), Afar ecosystem (Djibouti, Eritrea and Ethiopia), Karamoja Ecosystem (Ethiopia, Kenya, South Sudan and Uganda), and Nile Ecosystem (Ethiopia, South Sudan and Sudan). Other ecosystems for consideration are those that are shared with other Regional Economic Communities (RECs) such as the Maasai Ecosystem (Kenya and Tanzania) and Darfur Ecosystem (Sudan, South Sudan, Central Africa Republic and Chad).

2.3 Result Areas and Activities

Outcome 1: Surveillance and Laboratory Capacity for Early Detection and Diagnosis of PPR Built

Capacity building at national and sub-regional levels has to be a major element of the control programme for transboundary diseases like PPR. Particularly, epidemiological and diagnostic capacities are the most important areas to be addressed immediately. Of critical importance right from the earliest stages is to develop the epidemiological skills required to conduct surveillance.

Output 1.1. Surveillance Capacity Built

Surveillance systems to be established for a program depend on the epidemiological situation of the disease in the country or the objectives to be addressed. The objectives of surveillance in the first five years of the PPR control program, purpose and tools to be used are summarized in the table below:

Table 1: Objective, Purpose and tools be used in the PPR national surveillance program.

1.	To determine the prevalence and distribution of PPR in different parts of the country/production systems and identify the risk factors associated with.	To mainly draw risk maps to define priority areas for control and establish baseline on the status of the disease before the intervention - to be compared against the changes made after the intervention.	**Sero- surveillance** supported with questionnaire survey - Random/Representative Survey – in the unvaccinated population **PDS and risk analysis studies** to identify risks hotspots and transmission pathways important for defining priority areas for the control shall be included.
2	To rapidly detect cases/ outbreaks during the implementation of a control program-	For rapid response, revising risk maps and refining the targeting of control interventions in the course of the program implementation	**Syndromic surveillance** supported with **Participatory disease surveillance** (PDS) and **outbreak investigation** (with rapid test)
3	To monitor the effectiveness/ progress of the disease control program	to assess the effectiveness of the vaccination program in controlling the disease (achievement of > 80% flock immunity)	**Sero-monitoring** - Random/ Representative survey in the vaccinated population/flock

To achieve these objectives, the main capacity building needs of countries revolve around:

- Improving the sero-surveillance and sero-monitoring capacities which is important to assess the status of the disease (amount, distribution and risk factors) and measure the progress of a control programs.
- Building syndromic surveillance, disease investigation and participatory disease surveillance capacity for detecting outbreaks of PPR in the implementation period so as to inform and fine tune the strategy in the implementation process.

Countries in the IGAD MS are at different stages in terms of the required surveillance capacities. Sudan, Kenya, Ethiopia and Uganda are relatively in a better position than the other members of the

group. The rest of the group members have poor surveillance set up and require substantial capacity building support. Activities that need to be undertaken to build the required support are indicated here under.

Activity 1.1.1: Strengthen the National Animal Health information system of MS

Passive surveillance is the most likely way that PPR outbreak occurrences will be detected and reported throughout all of the stages. A well-functioning reporting system, to communicate passive surveillance data from the field to the veterinary services, is an essential component of a surveillance system. In this activity, the status of countries in terms of having a functional animal health information system in support of the PPR surveillance activities will be assessed, capacity building needs identified and supports are planned. To accomplish this task the following sub-activities will be supported by the program:

1.1.1.1. Conduct detailed assessment on capacity building needs of Somalia, South Sudan, Eritrea and Djibouti for running a proper national epidemio-surveillance system, with the lens of planned PPR surveillance activities. A consultant will be hired to undertake the task.

1.1.1.2. Support the development/adoption of an epidemio-surveillance system appropriate for each country context

1.1.1.3. Strengthen and harmonize the general surveillance systems of Ethiopia, Sudan, Kenya and Uganda based on countries own need assessment studies.

1.1.1.4. Strengthen the knowledge and skill of professionals involved in surveillance particularly at the national level. The training should at least cover the following areas: Data management and analysis, risk analysis, impact assessment, contingency planning, international trade regulations, value chain analysis and livestock economics.

Activity 1.1.2: Improve the capacity of countries to plan and undertake PPR sero-surveillance and sero-monitoring

The purpose of this activity is to acquire capacity to plan and undertake an assessment to determine the presence (or possibly the absence) of PPR in a country or region, its distribution among the different geographic areas/production systems and, ultimately, its impact on these areas/systems; and build capacity to monitor the effectiveness of a control program. Sero-surveillance results, apart from informing the control strategy, also serve as bench marks to compare the changes made as a result of the control interventions. To build sero-surveillance and sero monitoring capacities of countries, the following sub-activities need to be done:

1.1.2.1. **Establish PPR sero-surveillance/monitoring team at national and sub national level.**

Each member state in the IGAD region will establish its own national and sub national sero surveillance/monitoring teams. The national team will be composed of two veterinary epidemiologists (one from the national epidemiology unit and the other from the national laboratory) and two virologists from the national laboratory. The overall role of the national team is developing the national sero-surveillance/assessment/ and monitoring plan, leading the implementation and providing overall guidance and coordination of tasks related to PPR sero-surveillance/monitoring. In the same way the sub national team will be formed around each sub-national laboratory and will be responsible for undertaking sero-surveillance/ monitoring activities in its command area.

1.1.2.2. Prepare standard operating procedures (SOP) for PPR sero-surveillance and sero-monitoring.

A consultant will be hired and two separate standard operating procedure documents, one for national sero-surveillance and the other for sero-monitoring, will be prepared at the sub-region level. The SoPs will cover all the basics required for designing random sero

surveys, including randomization, sample size determination and sampling, sampling frame preparation, field planning and implementation.

1.1.2.3. Train the national and sub national team on the standard operating procedures. A training program will be organized at IGAD level. All members of the national sero surveillance/ monitoring team from each country will be trained on the SOP and serve as training of trainers in their own countries. The training received at the IGAD level will be cascaded to the subnational surveillance and monitoring teams.

1.1.2.4. Procure equipment and consumables necessary for undertaking the sero-surveillance/ monitoring. Each national and sub national team will be equipped with the necessary facilities required to undertake the sero surveillance and sero-monitoring. The list of items to be purchased for each team is indicated in annex--- (here only field facilities for surveillance are considered - laboratory facilities for surveillance are considered under laboratory).

Activity 1.1.3: Improve the capacity of countries to undertake PPR Syndromic surveillance, PDS and outbreak investigation for early detection of cases/outbreaks

Most small ruminant diseases have similarities in clinical manifestations. PPR is just one of a group of diseases of small ruminants which can be difficult to tell apart on clinical grounds. Even experienced animal health professionals can find it difficult to be certain about identifying some diseases, including PPR. The most common small ruminant disease that have some level of similarities with the clinical signs of PPR include: sheep and goat pox, contagious caprine pleuropneumonia, foot and mouth disease, pasteurellosis, contagious ecthyma and blue tongue. One recent study of field veterinary performance suggested that about half of small ruminants presumed to be suffering from PPR are not infected and about half of the actual cases of PPR are not suspected on clinical grounds.

Clinical surveillance for PPR alone, therefore, does not give sufficient information to guide a focused eradication program. Surveillance will be much more effective if it is broadened to detect and identify a syndrome rather than concentrating solely on PPR, and further investigate the syndrome with diagnostic test to detect the ones that are caused by PPR. Syndromic surveillance, combined with the use of rapid diagnostic tests performed in the field or at district/subnational laboratories will enable investigators to find and rapidly confirm almost all PPR outbreaks.

Syndromic surveillance can also provide much useful information to be used to set strategies for a broad small ruminant health improvement programme. In the case of PPR we can use the term pneumo-enteritis (PES) for the syndrome and define an appropriate Case Definition.

The pneumo-enteritis case definition - "An outbreak of pneumo-enteritis is characterized as a number of disease cases in a flock (in exceptional cases an individual animal) in which the following clinical signs are present: Bilateral, clear or purulent ocular and nasal discharges TOGETHER WITH: Coughing, sneezing and fever AND one or more of the following: conjunctivitis, difficult breathing (dyspnoea), erosions (ulcers) in the epithelium of the mouth with or without a cheese-like coating on the epithelium, nodules around the mouth, diarrhoea or dysentery and death.

The confirmation, once the PES has been detected, is done by fielding a disease investigation team and using pen side tests for PPR. There will be three levels of certainty during the investigation process:

- **A suspected case of PPR** exists where a report is received indicating an outbreak of PES
- **A possible case** is signaled when an outbreak investigation confirms the presence of typical clinical signs of PES and/or there are epidemiological linkages to other outbreaks
- This becomes a **Confirmed Case** when animals are tested positive in a pen side test. For full control operations to be mobilized a confirmed diagnosis is required.

According to the system indicated above, the detection of syndromes will be through the routine passive system or PDS. Reporting of syndromes will be through the regular national passive surveillance systems which may vary from country to country, including cell phone based real time reporting

systems. The syndrome will then be investigated by the outbreak investigation team. If confirmed by the pen side test, full control operations will commence but samples from positive animals with the pen-side test will be sent to the national/ reference laboratory for further confirmation. If confirmed at national/ reference laboratories, sample will be sent to designated regional support laboratory / world reference laboratories for characterization. Based on the above premises, activities required to support the capacity building needs of countries are outlined as follows:

1.1.1.1. Prepare training materials and guidelines - Consultants will be hired to prepare the training materials indicated below, which will be used in the training of professionals, paraprofessionals and stakeholders at different stage of the small ruminant value chain.

- Syndromic surveillance manual for PPR and other SR diseases
- Participatory epidemiology techniques
- Standard operating procedures for PPR outbreak investigation

1.1.1.2. Establish PDS and Disease/outbreak investigation team at national and subnational level. Each member state will have its own PDS and disease/outbreak investigation team. The national team will be composed of two epidemiologists from the epidemiology unit at head quarter and one virologist from the national laboratory. The subnational team will be from the subnational laboratories and the composition will be same. The same team can be formed at county/district level as necessary, but the composition can be one veterinarian and two animal health technicians reporting to the sub national team. The overall role of the team is planning and implementing PDS and Disease/outbreak investigation as per the direction and guidance given by the national team.

1.1.1.3. Conduct experimental PPR infections at national/ reference laboratories in order to prepare a clear set of pictures and video films for demonstration and communication purposes. The experimental infection will also be used to train the veterinarians selected to conduct participatory disease searches, on disease recognition (syndromes of PPR), laboratory investigation and pen side test, etc.

1.1.1.4. Provide hands on training to veterinarians and animal health technicians on disease recognition, syndromic surveillance, participatory disease surveillance, disease/ outbreak investigation, tracing forward/backward, risk analysis and mapping at sub-regional, national and subnational level. The training at sub-regional level will be a ToT training which will then be cascaded to the sub nationals and beyond.

1.1.1.5. Enhance the awareness and engagement of producers and various actors in the value chain on diseases surveillance through various communication means.

The small ruminant value chain in all the member states will be mapped; and value chain actors and their training needs will be identified. Advocacy and communication materials on the disease, the benefits of the control program and surveillance system put in place, developed and widely disseminated. For producers and traders, trainings on disease recognition, importance of reporting and advantages of the control program will be organized by the program. Depending on countries context strong partnership between governments, NGO's, private sector and civil society organizations will be made (particularly for Somalia and South Sudan).

Activity 1.1.4: Establish a formal sub-regional institutional set up for animal health information sharing among MS

Because of the transboundary nature of PPR, the efficient control and eradication of this disease is not a task of a single country but for all countries, infected or not infected but at risk, in a given epidemiologically linked sub-region. In consideration to that fact, a regional approach, that enhances cross country collaboration on exchange of information, facilitating joint planning on surveillance and disease control, harmonization and strengthening sub-regional capacity building on various

fronts is required. To facilitate this, in the first five years of the program, the following activities will be undertaken:

1.1.1.1. Designate Sub-Regional Leading Epidemiology Centre.

A set of criteria to designate sub-regional leading epidemiology centre will be developed by the sub region epidemiology network. The criteria will be endorsed by the CVO's of the sub-region and the selection of the centre will be done by an independent team organized by the Global secretariat.

This centre is expected to provide technical capacity building support to the national epidemiology/surveillance units/teams which are required to develop and implement their own national surveillance plans. Together with the sub-regional epidemiology network it also helps to harmonize national surveillance plans at sub-region level.

1.1.1.2. Establish sub-regional disease information system /database:

The database will be established within the sub-regional designated leading epidemiology centre. The centre will regularly receive PPR and other small ruminant diseases event information from member states, process and give feedback to and share the information to other MS. Together with the epidemiology network it will also undertake regional analysis and inform the surveillance system control measures being undertaken in the MS. The facilities required for establishing the system/database and manpower as required will be supported by the program through the PPR Project Management Unit (PMU) at IGAD/ ICPALD.

1.1.1.3. Strengthen the existing national and sub-regional epidemiological network:

This is important for harmonizing the national surveillance plans at sub-region level. Regular meetings of the national and sub-regional network will be supported by the program.

Output 1.2 Laboratory capacities built

Table 2: The test methods available for the diagnosis of PPR and their purpose as defined by OIE

Method	Population freedom from infection	Individual animal freedom from infection	Confirmation of clinical cases	Prevalence of infection/ surveillance	Immune status in Individual animals or population in post vaccination
Competitive ELISA	++	++	-	+++	+++
Virus Neutralization	+++	+++	-	+++	+++
RT-PCR	-	-	+++	-	-
Real-time RT-PCR(QRT-PCR)	-	-	+++	-	-
Virus isolation in cell culture	-	-	++	-	-
Immunocapture ELISA	-	-	+++	-	-
Agar-gel immunodiffusion	-	-	+	-	+
Counter immune electrophoresis	-	-	+	-	-

Test methods available for diseases considered in the differential diagnosis of PPR, such as sheep and goat pox, CCPP and FMD are indicated in the table below:

Table3: Test methods for diseases to be considered in the differential diagnosis of PPR.

Sheep and goat pox	PCR and Virus isolation
CCPP	Latex agglutination test
FMD	Antigen typing ELISA, Virus isolation and PCR
Bluetongue	Antigen identification- Real time RT-PCR, RT-PCR and virus isolation

The aim of capacity building of laboratories in member states is therefore to have one or more laboratories in each country to have

- the ability to do antigen/gene detection for confirmation using Immuno capture ELISA (less developed labs) and/or PCR tests for case detection/outbreak investigation (well-developed labs),
- the ability to detect antibodies using Competitive ELISA/Virus neutralization tests for sero-surveillance and sero monitoring,
- the ability to carry out tests for differential diagnosis of diseases common in their respective countries and
- get accredited for the tests they are doing so that the test results can be reliable.

The other important aim of laboratory capacity building in the region is to designate one of the laboratories in the region as PPR support lab and build its capacity to do PPR virus characterization for the MSs.

To achieve the above objectives the following activities will be undertaken in the first five years of the PPR control program:

Activity 1.2.1: Asses the capacity building needs (facility, knowledge/skill and system) of national/ reference laboratories in each member states against the desired diagnostic capacity indicated above

Most of national/reference veterinary diagnostic laboratories of countries in the sub-region are at variable levels in term of capacity to run these new assays, some of them being able to perform only some classical assays because of very limited funding support. The program will commission a consultant to assess capacities of MS in terms of undertaking PPR diagnosis and differential diagnosis of other small ruminant diseases that have similar clinical signs with PPR and identify their capacity building needs. The gaps in knowledge and skill, facilities and system for quality assurance will be addressed based on the findings of the assessment. Apart from this, the laboratory designated as regional support laboratory will be assessed separately for its capacity for virus characterisation, and the support will be provided based on the gaps identified.

Activity 1.2.2: Build the capacity of national/reference laboratories to enable them undertake quality assured tests for PPR and other SR diseases indicated above

1.2.2.1. Equip one or more reference/national laboratories in each member states with the necessary facilities and reagents.

Based on the capacity gap assessment result, the programme will ensure adequate stocks of reagents, laboratory devices, equipment in the national/reference laboratories involved in the diagnosis and differential diagnosis of PPR. Support will be provided by the designated regional support laboratory and the Joint FAO/IAEA Division.

1.2.2.2. Prepare training materials based on the training needs/gaps identified

Consultants will prepare training materials and standard operating procedures on various topics as identified in the training need assessment, including sample collection, handling and transport. The training materials prepared will be validated by the joint FAO/IAEA division before use.

1.2.2.3. Provide hands on training to the laboratory staff based on the materials produced

Regional ToT training will be organized with the support from the joint FAO/IAE division. The training will be hosted by the designated regional support/lead laboratory and selected staff from each national/reference laboratory will be trained on various diagnostic assays using the validated training material. The ToT trainees will organize training program in their respective countries to train the remaining staff in the national/reference laboratories. The training can also be provided to other sub-national labs as required.

1.2.2.4. Provide hands on training to the subnational laboratories to manipulate samples before they are sent to national/reference laboratories

Subnational laboratories operating in the PPR affected areas will be assessed against predefined criteria and some will be selected and their capacity built to be used as peripheral laboratories who will be engaged in processing/manipulating samples before they are sent to the national/reference laboratory for the final diagnosis. This way the through puts of national laboratories will be enhanced.

1.2.2.5. Provide hands on training to the field/subnational staff on sampling, handling and transporting of specimens to the lab,

The ToT trainees will provide training on sampling, handling and transportation of specimens to the sub-national laboratories and shall be cascaded to the district veterinary offices as required. The procedure will be strictly monitored to make sure that they are done as per the standard operating procedure developed for specimen collection, handling and transportation.

1.2.2.6. Install quality management system in each of the labs and get accreditation for each of the tests identified above:

Each national/reference laboratory will be supported to put in a quality management system. Tests to be used in the detection of antigen/gene/antibody of PPR must be accredited by third party. The accreditation will be supported by the program. However, until they get accredited the results of the laboratories will be accepted if and only if they qualify the proficiency testing institutionalized by the sub-region designated support/lead laboratory. This will help to assure the quality and harmonize the testing procedures to be used in the sub-region.

Activity 1.2.3: Establish a formal sub-regional institutional set up for providing diagnostic support and quality assurance to national/reference laboratories in Member States

1.2.3.1. Identify and designate sub-regional Support/lead laboratory for the program

A set of criteria to designate PPR and other SR diseases reference laboratory for the sub-region will be developed / adapted from FAO/ by the sub region laboratory network. The criteria will be approved by the CVO's of the region and the selection of the laboratory will be done by an independent team organized by the Global secretariat and FAO/IAEA division (one of a must to meet criteria is - it should be an ISO 17025 certified lab with an accreditation for the PPR tests as it is going to be engaged in proficiency testing with national labs). The designated support laboratory will provide diagnostic and virus characterisation support to the national/ reference labs in the region. It will also provide proficiency testing service to these laboratories until they get third party accreditation for the tests used in PPR diagnosis.

1.2.3.2. Build the capacity of the designated laboratory to provide support to MS and undertake virus characterization;

The capacity of the designated support/lead laboratory for virus characterization will be assessed, gaps identified and the capacity building work will be done by the joint FAO/IAEA division of the global program. Support will also be provided to facilitate the collection and shipment of test samples from MS to the designated support laboratory and from the designated support laboratory to the world reference and other laboratories in the network.

1.2.3.3. Support the designated laboratory to twin with one of the FAO/OIE PPR world reference laboratories

Support will be provided to a country, where the designated support laboratory is located, to request and receive twinning programs with FAO/OIE world PPR reference laboratories. It will also be supported to network to a sufficient standard so as to successfully implement modern techniques for the full identification and characterisation of PPR virus (PPRV).

1.2.3.4. Strengthen the existing national and sub-regional laboratory networks

The regional laboratory network will mainly be involved in facilitating capacity building, harmonization of test procedures, interpretation of results, proficiency testing etc. Support will be provided to the existing national and sub-regional laboratory networks by organizing meetings regularly (every six months) and encourage constant dialogue between diagnosticians and epidemiologists as it helps to understand the origin and direction of spread. The program will also support one regional meeting to be organised every year between national laboratory and epidemiology staff in the sub-region.

Outcome 2: Status of the disease in MS defined and clear intervention plan developed/ updated

The precise epidemiological situation of PPR is unknown or poorly known in most of the IGAD MS due to poor surveillance and laboratory capacities. In this situation, there is no structured information available on the presence and distribution of PPR that would possibly lead to the formulation of effective control plan. Therefore, an Assessment Plan will be developed, endorsed and implemented by the Veterinary Authorities and the presence, distribution, socio economic impact and main risk factors associated with PPR will be clearly elucidated to guide the development and implementation of intervention plan for step-wise PPR control.

Output 2.1. Status of the disease defined

Based on the surveillance capacity built under outcome one the status of PPR in each MS will be clearly established in the first year of the control program through epidemiological assessment of PPR. This will allow MS to acquire a better understanding of the presence or possibly the absence of PPR in the country, its distribution among the different farming systems and, ultimately, its impact on these systems. The information generated will guide MS to control PPR only in specific sectors or geographic zones or in the entire country.

Activity 2.1.1- Develop national assessment plan

Each member state will develop a national assessment plan. The plan will be developed by the national surveillance team and should be aligned with global and regional strategies for PPR control and eradication. It should also be fully endorsed by the veterinary authority.

Activity 2.1.2- Conducting detailed assessment to know the exact status

The national assessment plan will be fully implemented to elucidate the national PPR situation and to gain a better epidemiological understanding of the presence, distribution and main risk factors associated with PPR in the country. A better epidemiological understanding of PPR and of its impact can be reached through different methodologies including Participatory disease surveillance (PDS), sero-surveillance, a combination of PDS and sero-surveillance and post-assessment visits to confirmed PPR outbreaks to evaluate its impact

This assessment stage should be a relatively short period, one year, to allow control activities to start as soon as possible, but long enough to obtain a proper assessment, which will be the basis for the control Strategy. At the end of this assessment the epidemiological situation will be known to

determine the absence or presence of PPR in the country which would lead to zonation of targeted areas for a risk-based intervention.

Activity 2.1.3- Provide indications on the prevalence of other major SR diseases

A reasonably clear understanding of the epidemiology of other priority small ruminant diseases, which should include prevalence, seasonality, vectors involvement etc., will be documented. Almost all MS have selected priority small ruminant diseases based on defined criteria such as their impact on livestock keeping communities and the national economy. A participatory rapid appraisal would be carried out in defined regions/communities to further corroborate and refine the prioritization process. A clear understanding of the existing control measures applied as a regular or emergency response, including availability of vaccines should be considered in the prioritization process.

Output 2.2. Intervention plans developed/updated

Based on the output of the assessment done in each of the MS, an intervention plan will be developed. The specific objective of this plan is to progressively control PPR in the MS in order to enhance small ruminant productivity and production, and improve trade. The plan should be well aligned with global and regional strategies and fully endorsed by the veterinary authorities. Sub-regional analysis will carried out regularly to identify and understand sub-regional epidemiological systems in order to build coordinated and targeted control plans. Moreover, a harmonized plan based on the concepts of epidemiological zonation -epi-zones will be developed and implemented.

Activity 2.2.1- Develop/adjust country specific intervention plan

Each member state will develop a national intervention plan harmonized with other MS in the sub-region. The intervention plan will be developed by a team of national experts and should be aligned with global and regional programmes for step wise control and eradication of PPR. It should also be fully endorsed by the veterinary authority.

Activity 2.2.2- Sub-Regional analysis

Sub-regional analysis is needed to identify and understand sub-regional epidemiological systems in order to build coordinated and targeted control plans. Geographic areas that share virus flows or the clear risk of shared virus flows must be identified. In some cases, regional epidemiological systems will involve more than one regional economic community.

Sub-regional and national assessments are interrelated and mutually informative. As national assessments are completed, these should contribute to update sub-regional analysis. This will be done by the epidemiology network and the designated lead epidemiology centre of the sub region. As the assessment is a dynamic undertaking it will be updated annually during the regional Roadmap meetings in light of new information and changes in the epidemiology profile of countries in the sub-region.

Activity 2.2.3- Develop a harmonized plan based on the concepts of epidemiological zonation -epi-zones

An ecosystem approach with enhanced coordination and harmonization of activities together with regular exchange of information between 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. These are defined geographical area/ zone occupied by one or more closely related ethnic communities and their livestock and adjacent areas into which these animals are moved for pasture or trade purposes. The livestock population in such an area therefore constitutes a continuum that is epidemiologically uniform, regardless of the national boundaries. Possible ecosystems include the Somali Ecosystem (Djibouti, Ethiopia, Kenya and Somalia), Karamoja Ecosystem (Ethiopia, Kenya, South Sudan and Uganda), and Nile Ecosystem (Ethiopia, South Sudan and Sudan). The program will further identify other ecosystems in the IGAD region.

The programme will support MS to regularly organise bilateral and regional coordination meetings to harmonise PPR control, surveillance, cross border movement and legal framework.

Outcome 3: PPR Prevention and Control Capacity Built, Implemented and Incidence of the Disease Reduced

The program will build Institutional capacity for effective and efficient implementation of PPR control. The personnel in charge of implementing the programme will be appropriately trained. The objectives of vaccination campaigns is to reach out 100 percent of the targeted small ruminant population and to obtain 80 percent post vaccination flock immunity.

The programme will support national veterinary authorities to explore ways of working with communities and other stakeholders to implement biosecurity and movement controls between the vaccinated/non-vaccinated sectors/zones and PPR infected and free areas. Emergency preparedness plan for apparently free areas will be developed to prevent the introduction and establishment of PPR. MS will also be supported to formulate/design, validate and implement appropriate control plans for the prioritized Small ruminant diseases (SRD).

Output 3.1. PPR Prevention and Control Capacity Built

The mounting of a major disease control intervention is a complex logistical operation that requires the very rapid and effective mobilization of resources and the moulding together of a large group of professional and technical persons into a cohesive force. For these reasons, a great deal of forethought and planning is necessary to develop a national animal disease control plan. Field operation teams will be established at various administrative levels and trained. The personnel in charge of implementing the programme will be appropriately trained and familiar with the vaccination strategy, on the transportation, storage, dilution of vaccines, marking and reporting work. Moreover, the programme will procure sufficient vehicles, cold chain, and vaccination, camping and cooking equipment for effective implementation of the targeted vaccination. Already available resources procured and capacities built under the EU SHARE program for countries such as Djibouti, Kenya, Ethiopia and Somalia will be taken into consideration in identifying current needs.

Activity 3.1.1- Establish field operation team and train vaccination team

The programme will support the establishment of field operation teams and capacitate them in the planning, monitoring, reporting etc. of field activities and logistics. Moreover, the capacity of public and private sector veterinarians, animal health assistants and CAHWs will be built to effectively implement the PPR control programmes as designed. This will include:

a. Familiarize all field veterinarians and para-professionals in the project area with vaccination strategy at least on an annual basis.

b. Train all field veterinarians and para-professionals on the transportation, storage, dilution and administration of vaccines, marking of vaccinated animals and reporting work;

Activity 3.1.2- Supplying the necessary logistics

The program will support MS in the provision of essential logistics for efficient and effective implementation of PPR vaccination in targeted geographic areas. The logistic include procurement and supply of 4 wheel drive vehicles, vaccination, cold chain and camping equipment. The allocation of the logistics to MS will depend on the population of the small ruminant targeted for vaccination, the number of vaccination teams and taking into account already existing capacity built through national and regional programs and projects such as EU SAHRE.

Output 3.2. 100% of the targeted population vaccinated, 80 % flock immunity attained and incidence of clinical PPR in the targeted population reduced to zero

As described in section 2.2 the approach to be adopted is a risk based targeted vaccination of small ruminant population in high risk areas. The objectives of vaccination campaigns for PPR is to reach

a post vaccination 80% immunity at flock level, in the targeted geographical area or farming system level in order to break the epidemiological virus maintenance and spread cycle. To obtain such a percentage the vaccination coverage should be almost 100% of small ruminant populations above three months old in targeted areas. The vaccination over subsequent years is expected to bring the incidence of clinical PPR disease to almost nil.

Activity 3.2.1- Pre-vaccination Sero-surveillance

A baseline sero-prevalence to establish previous exposure to virus or vaccination prior to the initial vaccination will be performed in all MS. The pre-vaccination sero-surveillance will enable countries to make comparison against post vaccination sero conversion and to assess if the desired 80% flock immunity is already achieved in a given area. This surveillance can actually be combined with the first vaccination program.

If PPR vaccination is done through public private arrangement using private animal health workers, the pre-vaccination sero-surveillance will be used as a monitoring tool to assess the efficiency and compliance of private operators to agreed terms of contracts.

Activity 3.2.2- Procurement and delivery of certified vaccine

Homologous PPR vaccines based on cell culture-attenuated strains of PPR virus are currently produced by IGAD MS such as Ethiopia, Kenya and the Sudan. Manufacture and quality testing of these vaccines and others imported outside of the sub-region must be done in accordance with the OIE Manual of Diagnostic Test and Vaccines for Terrestrial Animals (Terrestrial Manual) Chapter 2.7.11 in order to guarantee vaccine safety, potency and efficacy. An independent quality control of the vaccines should be done by Pan African Vaccine Centre (PANVAC) before mass utilization. All batches of vaccine used in the programme will be submitted to PANVAC for quality certification.

At sub-regional level, the needs of certified PPR vaccines will be assessed annually by IGAD in collaboration with the PPR Secretariat.

Activity 3.2.3- Vaccination

Vaccination is the key to preventing and controlling PPR in high risk or endemic areas. Targeted vaccination will be carried out in areas were the virus is believed to be circulating (endemic areas) or in immediately adjacent areas-at-risk where immune barriers are desirable.

a. In targeted areas

This is a normal control component, targeting a specific zone where PPR is endemic or at high risk, or a specific sub-population at higher risk or of higher commercial value to be vaccinated on a regular basis. Considering the complexity and experience from several countries, the programme will propose two rounds of vaccination campaigns in the targeted population followed by one or two vaccinations of the new-born animals in successive years. The objectives of vaccination campaigns for diseases such as PPR are classically to reach a post vaccination 80% immunity at flock, geographical area or farming system level in order to break the epidemiological virus maintenance and spread cycle. To obtain such a percentage the vaccination coverage should be almost 100% of small ruminant populations above three months old.

Currently, in the IGAD region, vaccination campaigns are mostly conducted in response to disease outbreaks but wider campaigns have been conducted in several countries with the active support of development partners, international and regional organizations. Some had been conducting vaccination for many years but reaching only an average of 15–30 percent of the stock. While in others recent experience with mass pulsed vaccination has demonstrated the feasibility of rapid area-wide clearance of PPR virus infection. These campaigns were immediately successful in greatly reducing the incidence of PPR even to a point approaching elimination giving confidence that concerted area-

wide action could achieve eradication. The later experience in the region underscores the feasibility of aiming 100% vaccination coverage to achieve elimination, rather than ongoing, low-coverage, annual vaccination campaigns.

Therefore, the emphasis at Stage 2 should be vaccinating for virus elimination, aiming at reducing the time frame for PPR eradication at national level. It is recognized that some countries might not be able to proceed at this speed, for whatever reason, which is why the programme budget includes a vaccination contingency component.

The total estimated SR population in the MS is 242 million and the population to target for vaccination in high-risk areas is estimated at around 145.2 million. As already mentioned in activity 2.1.2, specific country vaccination plans will be guided by the initial epidemiological assessment and subsequent surveillance.

b. Emergency component

Consists the delivery of vaccine upon detection of clinical outbreaks, either in the area or production system not yet vaccinated or in the area or production system already vaccinated. In case of the later investigations will be undertaken to determine the reasons for the failure of the vaccination measures. Contingency stock of vaccine will be maintained to address emergency PPR outbreaks. The programme will also support OIE's efforts aiming to establish a PPR sub-regional vaccine bank at IGAD level.

Activity 3.2.4- Post Vaccination Evaluation (PVE)

The program will conduct Post-Vaccination-Evaluation (PVE) with collection of data for evaluating the results of the vaccination programme and monitor the whole vaccination chain accordingly. PVE can contribute to the overall assessment of vaccine effectiveness, which encompasses the vaccine attributes and its delivery, vaccination coverage and immune response to vaccination. For PPR vaccine it is assumed that if a quality vaccine is properly administered the animals will sero-convert and be immune, hence the vaccination coverage is a proxy of the population immunity if the vaccine delivery is done correctly.

Sero-surveillance will be used to evaluate the immune response to vaccination. Protocols should, wherever possible, be harmonised within MS and at sub-regional level in order to gain a good understanding of the effectiveness of vaccination at national and regional level. Post vaccination serological surveys should also be combined with data collection on CCPs and other potential risk factors for disease spread or vaccine failure.

SOPs for proper cold chain management for the vaccine storage from the vaccine producer until the vaccine inoculation will be developed. Temperature registration cards are used in each point of the vaccine distribution system. These cold temperatures have to be maintained in a cold chain system that needs to be assured throughout the different delivery stages, from central purchase point to distribution centers to the vaccinators in the field. Once the vaccine is reconstituted, it needs to be utilized as soon as possible, but not later than 30 minutes after dilution.

Activity 3.2.5- Enhanced participatory disease search

As indicated in output 1.1, build surveillance capacity of MS, PDS is one of the methods of participatory epidemiology (PE), which uses participatory approaches and methods to improve the understanding of PPR epidemiology. The basic principal is that public or private veterinary professionals and local people work together to appraise and analyze situations.

PDS teams will be established in each of the MS and deployed to provide an estimate of PPR annual

clinical incidence in the target small ruminant population at the national level, either at the initial stage of the control programme or during all Stages of its implementation. The mobile PDS teams will be primarily based in the sub-national veterinary laboratories. Several methods are used successively during PDS including semi-structured interviews including focus-group discussions or individual farmers; ranking and scoring (e.g. disease matrix scoring); visualization through mapping, timelines, etc. This information must be cross-checked by using secondary information sources, by probing, by using triangulation and saturation principles, and/or by using laboratory diagnostics.

Activity 3.2.6- Outbreaks investigation, confirmation and characterization

All suspected outbreaks of PPR will be immediately investigated and confirmed by laboratory. Investigations will be conducted for all detected/reported outbreaks, whether in or outside the vaccination sectors/zones. Confirmed samples will be submitted to sub-regional designated support laboratories and world reference laboratories for characterization as required.

The program will improve disease notification and reporting system to enhance early detection and response to PPR outbreaks. An active real-time disease reporting system will be initiated and expanded through the introduction of improved disease surveillance tools and ICT based disease notification and investigation. Monitoring tools will be developed and implemented to ensure the sensitivity, specificity and timeliness of the reporting system.

An outbreak investigation Form will be designed to collate information related to possible date of introduction of the virus into the infected premises, possible means of introduction and Potential for spreading. Standard operating procedures and guidelines will be developed and enforced to ensure prompt measures are taken to contain virus spread once an outbreak is confirmed. The choice of control measures such as animal movement restrictions, culling or emergency vaccination, or a combination of these, will all depend on the policy of MS.

Activity Output 3.2.7 Biosecurity Improved

While developing and maintaining biosecurity is difficult, it is the cheapest, most effective means of disease control available, and no disease prevention program will work without it. Therefore, the programme will support MS to explore ways of working with livestock keepers and other stakeholders to implement biosecurity measures between the vaccinated/non-vaccinated and PPR infected/free sectors/zones. The programme will 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 task. Other interventions include developing and disseminating awareness materials and organising sensitization meetings and site visits to verify whether their biosafety/biosecurity conditions are adequate.

Output 3.3. PPR Contingency Plans developed and implemented

Emergency preparedness plan for apparently free areas will be developed to prevent the introduction and establishment of PPR. Emergency response plans should be up to date, tested in simulation exercises and embedded in national legal frameworks. Emergency funds should be 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 response efforts are executed rapidly and with success.

Support will be provided to countries in developing their contingency plan and regularly testing its application through desk or/and field simulation exercises. A provision for vaccines required for contingency operations (considering that around 5 percent of the eligible population of small ruminants could be vaccinated) will be established.

Activity 3.3.1- develop PPR contingency plan

Support will be provided to countries in developing their PPR contingency plan. The plan should be a well-articulated strategy document designed to define actions to be taken in the event of a PPR outbreak. It should contain details of the resources needed to meet such an emergency as well as an action plan for efficient, effective and rapid deployment of both human and material resources for effective containment of the disease and elimination of infection. An outline of suggested format and contents of a national PPR contingency plan is provided as a guide but should be modified to suit the needs and circumstances of individual countries.

Activity 3.3.2- regularly testing its application through simulation exercises

Simulations exercises are critical for better preparedness of all personnel and for further refinement of the Plan. The correct application of the contingency plan will be tested regularly through desk or/and field simulation exercises to maintain a high level of awareness. Participating in a simulation exercise gives the opportunity to evaluate and improve cooperation with stakeholders, as well as to develop the skills and capacities needed to respond to an unexpected or unusual event. Examples can be drawn from avian influenza and Ebola virus disease simulation exercises which played a key role in identifying the weak points in the system if the disease was to strike. Given the cost of carrying out actual field level simulation exercises, tabletop simulations on PPR are recommended for all MS because they are cheaper and faster to carry out. However, there should be at least one field level simulation exercise in the sub-region.

Activity 3.3.3- Keep stock of PPR vaccine for contingency operation

The program will keep stock of PPR vaccine for contingency operation through establishment PPR vaccine bank for the IGAD sub-region. This will be based on considering that around 5 percent of the eligible population of small ruminants could be vaccinated. The overall objective of this PPR Vaccine Bank is to rapidly provide MS with a stock of PPR vaccines in order to vaccinate the animal population at risk with high quality vaccines complying with international standards. The vaccine supplier will play a prominent role in ensuring the supply of high quality PPR vaccine that comply with OIE standards, rapid and smooth transportation of the vaccines requested to the countries of destination. This includes maintenance of the cold chain until delivery, marked by the official acknowledgement of receipt by the relevant authority of the beneficiary country, as well as guaranteeing quality of the vaccines delivered.

Output 3.4. Other Small ruminant diseases prevalence reduced

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. Combining PPR control with other activities such as vaccination against other small ruminant diseases increases efficiency, broaden impact and encourage fuller participation of livestock keepers.

The programme will undertake a feasibility study to determine the tangible benefits of a combined control programme of one or more diseases and support MS to formulate/design, validate and implement appropriate control plans for the prioritized Small ruminant diseases.

Combining activities to control and eradicate PPR with activities against other diseases should be considered cautiously as they could dilute the focus on PPR eradication. Every precaution will be taken to handle this risk and maintain a good balance between the possible positive and negative consequences of such approaches.

Activity 3.4.1- Identify other priority small ruminant disease for each member state

There are a number of other diseases of sheep and goats prevalent in the sub-region. Some of these diseases are common across the sub-region while some are unique to specific countries or specific

eco-zones within the region. Small ruminant diseases identified as priority for control by MS are shown in the table below.

Table 4: Other small ruminant diseases identified as priority for control by MS

Djibouti	Ethiopia	Eritrea	Kenya	Somalia	South Sudan	Sudan	Uganda
PPR	CCPP		CCPP	CCPP	CCPP	SGP	SGP
CCPP	SGP		SGP	SGP	RVF	CCPP	CCPP
RVF			Brucellosis	Brucellosis	SGP	RVF	Blue tongue,
FMD			RVF		Helminthiasis	Brucellosis	Brucellosis
SGP			Helminthiasis		Mange		

Activity 3.4.2- Undertake feasibility study to determine the tangible benefits of a combined program without compromising the PPR control and eradication.

The programme will undertake a feasibility study to determine the tangible benefits of a combined control programme of one or more diseases without compromising the integrity of the PPR control & eradication effort. The regional and national analysis will be the only way to confirm the extent to which addressing several diseases together is appropriate to the local contexts.

Activity 3.4.3- support the formulation and validation of a control plan

Countries will be supported to formulate/design and validate appropriate control plans for the prioritized Small ruminant diseases (SRD) agreed during the regional Roadmap meetings. Appropriate template and guidelines will be developed for each of the prioritized small ruminant diseases to assist MS to formulate their national strategic plan.

Activity 3.4.4- Implement control plan for the identified disease

Countries will be supported to implement the control plan for prioritized small ruminant diseases. Progress made and challenges encountered in implementing SRD control activities will be discussed during the sub-regional Roadmap meetings.

Outcome 4: Stronger Veterinary Services in Support of PPR Control and Eradication Built

The effective control and eradication of PPR in each country will require well-functioning and well-resourced national Veterinary Services, as key components of the control and eradication effort – risk analysis, disease surveillance, disease investigation, laboratory diagnosis, quality assurance of vaccines, effective vaccination campaigns, and post vaccination evaluation, among others, are primarily the responsibility of the national Veterinary Services.

The quality of the VS depends on a set of factors, which include fundamental principles of an ethical, organizational, legislative, regulatory and technical nature. The program will support MS in reinforcing their legal framework, undertake regular assessment of their veterinary services using the OIE PVS tool and facilitate the creation of a partnership for the exchange of scientific and technical knowledge, ideas and experience through twinning arrangements.

Output 4.1. Legal framework reinforced

An adequate legal framework is a cornerstone that provides national and local authorities, particularly the Veterinary Services (VS), with the necessary authority and capability to implement PPR eradication activities. It constitutes also an enabling environment for stakeholders' involvement. For each stage toward eradication, it should be guaranteed that the national legislation framework in place provides authority for the types of activities due to be carried out.

As a follow up to an evaluation of the Performance of Veterinary Services (PVS) using the OIE PVS Tool, and at the request of Members, the OIE conducts missions to help governments that wish to modernise the national veterinary legislation and thereby help the veterinary services to meet the OIE standards. After an initial 'identification' mission the country may request a longer term collaboration with the OIE, under a formal agreement, with the objective of modernising the national veterinary legislation.

Activity 4.1.1- Assessment of legal framework through OIE legislative support mission (identification mission)

In this regard, countries that have not already requested OIE for a Veterinary Legislation Identification Mission under the OIE Veterinary Legislation Support Programme (VLSP) will be encouraged to make the request to OIE. This will assist countries to initiate the modernization of their veterinary legislation to provide legal support to the country's commitments to undertake the prevention, control and eradication of PPR. Legal experts will be engaged in the framing of revised legislative documents to guide national multidisciplinary task forces where necessary.

The objectives of the VLSP Mission were to raise awareness of the importance of veterinary legislation for modern, effective operation of the veterinary services, review the principles for developing high-quality veterinary legislation and review the current status of the Member's legislation relative to the OIE standards for veterinary legislation.

Activity 4.1.2- Based on the findings; proceed to VLSP legislation agreement with the OIE (including stakeholder consultation)

This will include assisting countries that had already undertaken the OIE Veterinary Legislation Identification Missions prior to the launch of the regional step-wise PPR control in order to tailor the legislation to adequately support implementation of the national plans. This can also be accomplished through the second, or Agreement Phase, of the OIE VLSP, which provides technical-legal support for legal drafting activities focused on legislation needs that were identified during the Veterinary Legislation Identification Mission.

Activity 4.1.3- Support the enactment and enforcement of the legislations through awareness creation at different levels

The national Ministries responsible for livestock will be encouraged to lobby relevant national institutions to accelerate processes for enactment and adoption of the revised legislation for its enforcement to support the implementation of plans for the prevention, control and eradication of PPR. MS will be supported to undertake awareness creation and popularization of legislations to various stakeholders.

From stage to stage, the country legal framework might need to be upgraded, notably to ensure that it supports efficient PPR prevention and control. Countries will be encouraged to request an OIE PVS Veterinary Legislation Identification Mission, if they have not already had one or if an update is desirable.

Activity 4.1.4- Organize regional harmonization of veterinary legislation

At regional level, progressive harmonization among the countries of the legal frameworks and competencies of VS are essential to build a common framework. AU-IBAR and OIE have already jointly conducted 5 such regional harmonization of veterinary legislation seminars for African RECs through the EC-funded programme ``Reinforcing veterinary governance in Africa'' (VET-GOV programme).

In collaboration with IGAD, the programme will facilitate regional seminars to harmonize veterinary strategy, including legislation and promote exchanges of information regarding animal health policies and strategies.

Output 4.2. Veterinary services strengthened

The program recognizes that good quality VS are indispensable for the successful and sustainable implementation of PPR. Therefore, MS will be supported. For VS to achieve their objectives and to support compliance with OIE international standards, the OIE has developed the Performance of Veterinary Services (PVS) Pathway, comprising PVS Evaluation ("diagnosis"), PVS Gap Analysis ("prescription") and various options in support of national planning based on the findings ("treatment"). The PVS Pathway is designed to assist VS to establish their current level of performance, to identify gaps and weaknesses regarding their ability to comply with OIE international standards, to form a shared vision with stakeholders (including the private sector), and to establish priorities and carry out strategic initiatives geared towards meeting their objectives, aligned with international standards.

Activity 4.2.1- Support PVS evaluation (including gap analysis)

OIE PVS Pathway is a continuous process aiming to sustainably improve compliance of Veterinary Services with international standards and their sustainable efficiency. Most of the IGAD MS with the exception of South Sudan and Somalia have undertaken the PVS evaluation and gap assessment. The program will support MS which have not done the evaluation and those who did the evaluation before five years to undertake a follow up evaluation. In general, the OIE recommends that an OIE PVS Follow up mission be conducted every two to three years. Since PVS assessment for Djibouti, Ethiopia, Kenya, Sudan and Uganda is done before three years follow-up missions will be carried out to allow an evaluation to be made of the progress that countries have made in sustainably improving their compliance with OIE's standards on quality since the time of the last PVS evaluation.

Activity 4.2.2- Regional level training on PVS evaluation tools for countries to build capacity on self-assessment

At regional level, the programme will support training of national VS staff on the use of the OIE PVS tool for self-assessments of the performance of veterinary services. Moreover, for bigger countries with federal arrangement such as Ethiopia and Sudan training of national experts on PVS evaluation will be carried out to undertake an independent evaluation of states.

Activity 4.2.3- Support twinning programs (statutory and education)

Twinning is an integral to the wider OIE initiative to improve the capacity of veterinary services in developing countries. Its main objectives are to improve a country's compliance with OIE standards by adapting its national system of veterinary governance to suit its context and needs, thereby enabling it to apply the appropriate standards. Focus will be made on improving specific areas of twinning that will provide demonstrable and practicable benefits to the MS concerned. So far there are no MS that apply and implement twinning arrangements to strengthen their veterinary statutory body. Moreover, with the exception of the Sudan there is no much done in terms twinning related to veterinary education. Therefore, the program will facilitate the creation of a partnership for the exchange of scientific and technical knowledge, ideas and experience through veterinary education and statutory twinning arrangements.

Activity 4.2.4- Support countries to request for OIE Laboratory mission

The PVS Laboratory Mission begins with the PVS Gap Analysis Report. So far, Sudan and Uganda carried out OIE laboratory mission. Therefore, the program will support the remaining countries to undertake OIE laboratory missions.

By addressing needs identified through PVS Pathway Evaluation and PVS Gap Analysis, the PVS Laboratory Mission determines the resources required for a national veterinary laboratory network to appropriately strengthen the capacity and structure of its Veterinary Services This may help the

country to adapt the level of investment for local, sub-national and national laboratories and inform political decisions on the possible creation of national reference laboratories.

Activity 4.2.5- Promote alternative veterinary services delivery model

The chances of PPR eradication success are related to the possibility of reaching the vast majority of small ruminants, particularly for vaccination, and this can be a challenge in smallholder village production especially in very remote or insecure areas. The quality and adaptability of the delivery systems will be a key element of program implementation and alternative service delivery approaches will be considered, including the use of veterinary paraprofessionals and community-based animal health workers, provided that appropriate legislation and veterinary supervision are in place. Moreover, the program will encourage awarding sanitary mandate to the private sector through contractual arrangement to implement the PPR vaccination.

Outcome 5: Functional Coordination Framework for the Control and Eventual Eradication of PPR Established

Output 5.1: Functional Coordination at sub-Regional and National level Established

The success of the PPR control program in the sub-region requires the establishment of functional coordination mechanisms at sub national, national and sub-regional level with defined and functional linkages to the coordination mechanism at continental and global level. To ensure this, the following activities need to be done.

Activity 5.1.1: Establish functional coordination framework at national and sub national level:

The programme will support countries in the sub-region to establish within the Ministry in charge of Livestock, a PPR control project management office which will serve as a national forum for coordination, planning and implementation of PPR control program. As evidenced in the RP eradication program, for bigger countries, branch coordination offices which will be housed in the sub national laboratories and reporting to the national PPR project management office are also important. Under the national project management office three teams namely: surveillance, disease investigation and operations will be established and work closely with the project coordinator. Surveillance and disease investigation teams will also be formed at the branch coordination office level and will be responsible for activities in their command areas. National epidemiology and laboratory networks will work closely with the surveillance and disease investigation teams. A national PPR steering committee to oversee the implementation of the PPR control program will be established. The steering committee members will be decided by the ministry in charge of livestock. The program will support national and sub-regional planning and coordination meetings.

Activity 5.1.2: Establish functional coordination framework at the sub-region level:

At the sub-region/IGAD level, a PPR project management unit (R-PMU) will be established within IGAD/ICPALD and will be responsible for coordinating and harmonizing the program at the sub-region level. The sub-region PMU supports the development and fine tuning of the sub-regional PPR control/eradication roadmaps and provides countries with a common long-term vision. It also provides framework for countries to develop and embark on national risk-reduction strategies with similar progress pathways, milestones and timelines that are supportive of the sub-regional efforts. The sub-regional designated lead epidemiology centre and diagnostic laboratory will be linked to the sub-region project management unit. The sub-regional data base established under the designate lead epidemiology centre will facilitate animal health information sharing among MS which is vital in the control of transboundary diseases like PPR. Under the sub-regional PMU a vaccine bank with the aim of giving rapid response to emergencies particularly for those countries not producing the vaccine will be established.

The PPR control program will also have a steering committee at sub-regional level to oversee the implementation of the program in the sub-region. The steering committee members will be drawn from each member states and meets once a year. The technical committee for PPR will also be strengthened and will continue to provide technical guidance to the PPR control/eradication program.

At global level, the PPR Secretariat is responsible for the overall management of the programme and its implementation, assessment, refinement and reporting. The sub-region PMU will establish functional linkage with the global secretariat.

2.4 Sustainability

Sustainability of program outcomes is highly likely. Sustainability is a core program principle and has been factored into program design through the following design features and/or expected measures:

- A key strategy to ensure sustainability of program activities is **participation of stakeholders** in the design and implementation of the program. During implementation these consultations will continue in all MS and at all administrative levels (at which all stakeholders are represented) as well as with beneficiary groups. Through this approach, stakeholders will be involved in the definition, and implementation of development strategies in their communities as well as in the implementation of the activities of the program, which will ensure ownership hence a high degree of sustainability, even after donor funding has ended.

- **IGAD and its MS interest and commitment.** There is strong IGAD and MS commitment to this program. Agriculture and nutrition are very high on the development agenda of MS, with increased budgetary allocations towards this sector. The programme is in line with MS objectives of increasing national food production as a contribution to self-sufficiency, raising household incomes and adding to food security. Projects and activities by development partners will also reinforce the current development focus on agriculture and food security issues, which this program addresses.

- **The demand for livestock and products** is growing fast, even faster than most other agricultural commodities. This is mainly attributed to human population growth, income growth and urbanization. This growth in demand is projected to continue for the coming fifty years. This creates great opportunity for IGAD member states endowed with huge livestock resource. There is growing understanding that the sector can be used as an engine for development of MS, but this can only be realized through control and eradication of devastating diseases such as PPR.

- A strong **political commitment** of the international community in favour of PPR Eradication, as an important tool to address other global challenges like poverty alleviation, food security and nutrition, resilience, women empowerment and climate change. The programme is in line, and with the same timeframe, with the Sustainable Development Goals.

- The **program's monitoring and evaluation** plans will ensure that its environmental and social benefits are adequately measured, valued and disseminated which would further promote its sustainability.

2.5 Risk and assumptions

Table 5: Risks and Mitigation Measures

No	Risk statement	Mitigating action
1	Political instability, security problems or conflicts	Targeting operations in secure and stable geographical zones.
2	Prolonged adverse climatic conditions such as drought, floods etc.	Take into account migration patterns for pasture and water to reach out livestock keeping communities.
3	Lack of transparency from national authorities regarding the PPR situation	Advocating, from IGAD and AU-IBAR levels, to national leaders and managers to ensure transparency and timely notification of PPR.
4	Weak political support for PPR control and eradication	High-level continental and sub-regional consultations through AU-IBAR and IGAD could support involvement of national political leaders.
5	Difficulties in reaching out remote inaccessible pastoral areas.	Use alternative animal health delivery systems using private animal health service providers, NGOs and CAHWs.
6	Weak or inexistent national policies for PPR control and eradication.	Drafting and endorsement of National Strategic Plans.
7	Insufficient or inexistent national budget for PPR control and eradication.	Advocate and sensitize MS ministries in charge of Finance and Budget.
8	Weak support from livestock keeping communities for PPR control and eradication (conflicting priorities).	The programme will undertake large sensitization of beneficiaries through, community dialogues, communication and awareness raising activities.
9	Legal framework for PPR control and eradication is weak, absent or very limited.	Legislation review and progressive upgrading of the national legal frameworks.
10	Inadequate capacity of national veterinary services.	Recruitment, training and capacitating of national vets and paravets.
11	Veterinary infrastructures are not suitable (including diagnostic national laboratories).	Strengthening infrastructures and modernization of laboratory equipment.
12	No national vaccine manufacturing plants or limited production capacities or inferior quality of the vaccines.	Strengthening laboratory capacities in the region, ensure access to OIE vaccine banks. Facilitate access to other vaccine manufacturing plants in other regions.

13	Basic facilities of the vaccination chain are not in place (vehicles, cold chain, syringes, other small equipment, …)	Support the countries in getting all the basic equipment and train on its use.
14	Long porous cross border between neighbouring countries in the sub-region.	Promoting regional meetings harmonize action plan and approaches in the control of PPR.
15	Absence of regional designated support laboratory to undertake advanced tests and support national laboratories.	Supporting the establishment of a designated regional support Laboratory.

PART 3: FUNDING, MONITORING & EVALUATION AND COMMUNICATION

3.1 Funding

The estimated budget for the five years programme is 204.5 million USD (see the summary by output below)

Table 6: Indicative Budget Summary

Outcome/output	Budget in USD	Percent share
Outcome 1 Surveillance and Laboratory Capacity Built		
Output 1- Output 1.1. Surveillance capacity built	25,215,000	12.33
Output 1.2 Laboratory capacity built	17,424,000	8.52
Outcome 2: Status of the disease in MS defined		
Output 2.1. Status of the disease defined	1,040,000	0.51
Output 2.2. Intervention plans developed/updated	0,280,000	0.14
Outcome 3: PPR Incidence of the Disease Reduced		
Output 3.1. PPR Prevention and Control Capacity Built		6.31
Output 3.2. Incidence of the PPR in the targeted population reduced to nil	100,264,813	49.04
Output 3.3. PPR Contingency Plans developed and implemented	0,559,000	0.27
Output 3.4. Other priority small ruminant diseases prevalence reduced	27,107,000	13.26
Outcome 4: Stronger Veterinary Services		
Output 4.1. Legal framework reinforced	0,742,400	0.36
Output 4.2. Veterinary services strengthened	10,068,800	4.92
Outcome 5: Functional Coordination		
Output 5.1. Functional Coordination	8,869,000	4.34
TOTAL	**204,482,013**	**100.00**

The detailed budget is indicated in annex 3.

3.2 Monitoring and Evaluation

A robust monitoring system is a fundamental requirement for ensuring delivery of programme activities, services and their impact to enable performance measurements and corrective feedback. Programme-level performance will be monitored on regular basis based on the programme objectives and results as outlined in the Programme logical framework (Annex 1). Necessary adjustments will be made to ensure that objectives are on track with the goals and are ultimately met.

The Project Monitoring and Evaluation system will collect data and information to measure performance and progress towards objectives, and be a learning tool to provide information for critical reflection on programme strategies and operations. It would support decision-making at

various levels and be a basis for results-based management. The salient elements will comprise as follows:

(i) Output monitoring to measure the progress of activities and achievement of outputs against annual targets for each programme component. The output indicators in the programme operational logical framework will form the basis for monitoring.

(ii) Participatory Monitoring and Evaluation (PME) at the community level involving M&E managers and field staff. PME forums will be set up in villages, with simple tools to help the communities monitor their progress, evaluate performance, and identify implementation issues. Wherever possible, they will involve women and youth groups.

(iii) Outcome monitoring will measure changes occurring as a result of programme interventions. This would entail annually measuring and assessing whether the programme is moving towards achieving its objective, step-wise reduction of the incidence and spread of PPR leading to final eradication.

(v) Impact evaluation will assess the contribution of the programme in achieving its overall goal. It will consist of baseline, mid-term and end-of-project surveys. This survey will be coordinated by the M&E Unit, and contracted to an external agency.

The Results and Impact Monitoring System of the program reports on semi-annual and annual basis on a number of first and second level results indicators that correspond to the output and outcome indicators respectively. The third level and impact monitoring system results are the anchor indicators used for impact assessment.

Periodic progress reviews will be carried out in close consultation with IGAD/ICPALD, AU-IBAR, donors, OIE regional and sub-regional offices, FAO country and regional offices in order to adjust work plan to respond to real needs and circumstances.

The program will carry out external evaluations, via independent consultants, as follows:

- a mid-term evaluation mission;
- a final evaluation, at the beginning of the closing phase;

The program shall analyse the conclusions and recommendations of the mid-term evaluation and jointly decide on the follow-up action to be taken and any adjustments necessary, including, if indicated, the reorientation of the program. The reports of the other evaluation and monitoring missions will be given to the MS, in order to take into account any recommendations that may result from such missions. The MS shall collaborate efficiently and effectively with the monitoring and/or evaluation experts, and inter alia provide them with all necessary information and documentation, as well as access to the project premises and activities. Monitoring and evaluation reports will be shared with donors and partners in a timely manner.

3.3 Communication and Advocacy

Effective communication with stakeholders for awareness creation will be crucial to the success of controlling and eradicating PPR. The programme will be supported by strong advocacy and communication coordinated between MS and IGAD/ICPALD to increase visibility of programme achievements and ensure an effective communication of Programme activities, results and goals with target beneficiaries, partners and key national and international stakeholders.

At sub-regional and national level animal health communication units dealing with PPR and other SRD to work in cooperation with animal health experts, as well as with other relevant partners will be established. A comprehensive communication action plan will also be developed to design, produce

and disseminate accurate, useful and timely public information on the prevention and control of PPR and other SRD. The plan will be elaborated within three months of inception of the project, identifying key messages, target audiences and a budgeted work plan of action with clear indicators of achievement.

A multimedia approach will be used to create awareness among livestock owners and extension staff through communication programs. Awareness creation program will be based on radio spots, posters and leaflets in major languages of the MS. The main aim is to increase the number of PPR and SRD reports received by the veterinary services and assure their proper management. Apart from this, special sensitization campaigns targeting not only stockholders but also the entire community will be carried out on regular basis through local administrations at grass root levels. Member States will utilize the most appropriate media, formats and languages at different levels to ensure effective communication on the strategy and its implementation. Overall, awareness will aim to:

- Enhance understanding among livestock keepers, traders, veterinary services and policy makers of their respective roles;
- Inform general and specific audiences in MS and internationally on the results, experiences, good practices promoted and the results and lessons learnt from the programme and;
- Ensure accountability and beneficiary feedback, which will contribute to innovative real-time reporting and evaluation of programme impact.

ANNEXES

ANNEX 1: Log frame

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
Goal / Impact	Enhance the contribution of the small ruminant sector to regional food security and nutrition, human health and economic growth, thereby alleviating poverty, increasing resilience and income generation and improving the livelihoods of smallholder farmers and general human wellbeing.	SDG indicators Increases in flock productivity Improvements in incomes from small ruminant husbandry systems Reduced poverty rate in targeted areas increased off-take of small ruminants and trade opportunities	National reports and statistics on livestock sector and on food security National household income and expenditure survey	Assumptions: security situation remains stable to allow access to all targeted areas No major conflict in & migration from neighboring countries; No extreme droughts (water shortages) or floods during the implementation of the project in targeted areas; Project approved and implemented in a timely manner. MS stays committed to the control and eradication of PPR.
Objective / Outcome	Achieving a progressive reduction of the incidence and spread of PPR leading to final eradication.	Incidence of PPR reduced to nil Mortality and morbidity due to PPR stopped Annual maps showing the areas that are free from PPR.	Results of participatory impact assessments on disease prevalence Serological surveys EMPRES WAHIS	Assumptions: The political situation in target countries remains stable to be able to access field sites. Co-operation from all stakeholders for vaccination and disease reporting. The MS continue their political and financial support

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
Outcome 1: Surveillance and Laboratory Capacity for Early Detection and Diagnosis of PPR Built				Assumption: Trained experts are deployed systematically to provide advisory services, have easy access to necessary tools to reach-out to the farmers Trainings are provided and/ or workshops delivered in local language Competent national experts are identified Risks: Limited response to disease reports by veterinary services will be disincentive to farmers
OUTPUT 1.1.	**Surveillance capacity built**	High-risk areas identified and control strategies developed based on this information	Reports	Security problems in South Sudan and Somalia will be improved

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
Activity 1.1.1	Strengthening the National Animal Health Information System of MS - (general)	- Countries infrastructure and system needs for running proper national Epidemio-surveillance system assessed (Somalia, South Sudan, Eritrea and Djibouti) - Based on the identified needs/gaps and context of countries, appropriate Animal health information system developed/adopted and deployed in all the four countries - Countries in the sub-region with relatively better animal health information system (Ethiopia, Sudan, Kenya and Uganda) strengthened and harmonized. - Three national epidemiology staff from each country (totally 24) trained on basic epidemio-surveillance techniques (Data management and analysis, risk analysis, impact assessment, contingency planning, international trade regulations, value chain analysis and livestock economics.)	- Capacity building need assessment document covering all the four countries. - The presence of functional Epidemio-surveillance systems in the four countries - The presence of harmonized Epidemio-surveillance systems in the four countries - Reports on number of national experts trained in the specified areas.	
Activity 1.1.2	Improve the capacity of countries to plan and undertake PPR sero-surveillance and sero-monitoring	- National and sub national sero-surveillance/ monitoring team established in each of the eight MS. - Two standard operating procedures, one for PPR sero-surveillance and the other for sero-monitoring, prepared. - Three epidemiology experts from each member state (totally 24) trained on SOPs ToT training organized at sub-region level and cascaded to the sub national level - - The surveillance/monitoring teams are equipped with the necessary facilities	Reports SOP documents for sero surveillance and sero monitoring Reports Reports and improvements in performance	

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
Activity 1.1.3	Improve the capacity of countries to undertake PPR Syndromic surveillance, PDS and outbreak investigation for early detection of cases/ outbreaks	- Three manuals (PPR syndromic surveillance, participatory Epidemiology and Disease Investigation) and one video-clip on the disease progression prepared. - National and sub national PDS and Disease/outbreak investigation team established in each of the eight MS. - All members of the national PDS and disease investigation team in each MS received hands on ToT training on PDS techniques, syndromic surveillance and outbreak investigation and cascaded to the sub national level - Producers and other value chain actors trained on disease recognition	No and type of manual produced Reports Reports Reports	
Activity 1.1.4	Establish a formal sub-regional institutional set up for animal health information sharing among MS	- A Sub-Regional Leading Epidemiology Centre designated and capacitated - A sub-regional disease information system / database established - Existing national and sub-regional epidemiological networks strengthened	Report Report and commencement of information sharing among MS electronically Reports	
OUTPUT 1.2	Laboratory capacities built	Proportion of supported laboratories with ability to safely and accurately diagnose PPR and other priority small ruminant diseases	Proficiency test results	FAO/IAEA will give the necessary support at the sub-region level

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
Activity 1.2.1	Asses the capacity building needs (facility, knowledge/ skill and system) of national/ reference laboratories in each member states against the desired diagnostic capacity indicated above	- Capacity building needs of reference laboratories in all member states assessed	Capacity need assessment document	
Activity 1.2.2	Build the capacity of national/ reference laboratories to enable them undertake quality assured tests for PPR and other SR diseases indicated above	- 8 reference laboratories (one in Each MSs) well equipped and capable of undertaking PPR diagnosis - A manual on laboratory techniques and sampling based on the gaps identified prepared - Sub-regional ToT training with the support of FAO/ IAEA organized and 24 laboratory experts(three from each country) trained based on the manual prepared and cascaded to the national and subnational labs and on sample collection, handling and shipment to field staff - Quality management system in all the reference laboratories (one in each MS) installed	Report Laboratory manual produced Report on the number of experts trained as ToT, Trained at national and sub national level and also field staff on sampling Report/number of laboratories with functional quality management system	

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
Activity 1.2.3	Establish a formal sub-regional institutional set up for providing diagnostic support and quality assurance to national/ reference laboratories in MS	- A Sub-Regional Lead/support laboratory designated - Capacity of the designated sub-regional support/ lead laboratory to provide support to MS and undertake virus characterization built - The designated laboratory twinned with one of the FAO/OIE PPR world reference laboratories - Existing national and sub-regional laboratory networks strengthened	Report Report and the designated support laboratory undertake virus characterization support to MS Report Report	
Outcome2: Status of disease in MS defined and clear intervention plan developed/ updated (epidemiological assessment)		A comprehensive risk-based Control Strategy and intervention plan developed or updated	Intervention plan	Governments remain committed to endorse and implement the intervention plan
Output 2.1	Status of the disease defined	The distribution of PPR, Hot spots, risk pathway and its impact defined.	Document defining the epidemiology of PPR produced	
Activity 2.1.1	Develop national assessment plan	Proportion of country assessment plans that are endorsed at national level Each country will formulate a national assessment plan based on data gaps to be filled or hypotheses to be tested using the PMAT.	Evidence of endorsement of assessment plans	Governments remain committed to endorse the recommended assessment plans
Activity 2.1.2	Conducting detailed assessment to know the exact status of the disease in each MS which will also serve as bench mark	Proportion of MS that actually carried out the assessment	Survey and assessment report	
Activity 2.1.3	Provide indications on the prevalence of other major SR diseases	Assessment done to establish prevalence of priority small ruminant diseases	Survey data	

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
OUTPUT 2.2	Intervention plans developed/ updated	Proportion of country strategies and plans that are endorsed at national level	Evidence of endorsement of strategies and plans	Governments remain committed to endorse the recommended intervention plans
Activity 2.2.1	Develop/adjust country specific intervention plan	Each MS prepare intervention plan and endorsed	An endorsed intervention plan	The plan is aligned with global and regional PPR strategies and programs.
Activity 2.2.2	Regional analysis	epidemiological systems well defined and understood	An endorsed minute of the roadmap meeting	To be updated annually during the regional Roadmap meetings
Activity 2.2.3	Develop a harmonized plan based on the concepts of epidemiological zonation -epi-zones	build coordinated and targeted control plans at sub-regional level Proportion of countries with epizones that have harmonized vaccination calendars	Agreement signed and plan developed for joint intervention	Commitment of MS to harmonize plans and interventions
Outcome 3: PPR Prevention and Control capacity Built, Implemented and Incidence of the Disease Reduced		PPR prevalence and incidence rates reduced to nil	Results of PDS EMPRES, WAHIS	The political and security situation in target countries remains stable to be able to access field sites.
OUTPUT 3.1	PPR Prevention and Control Capacity Built	Cumulative number of beneficiary trainees. Logistics to undertake vaccination procured and distributed to operation teams.	Pre-post training questionnaires Delivery notes for equipment, vehicles and supplies	Appropriate technical staff are assigned for training by the government. Timely provision of all required logistics to field operation teams
Activity 3.1.1	Procure Vehicles, cold chain, vaccination and camping equipment.	Procurement of vehicles, Cold chain equipment, vaccination equipment , camping equipment and other essential supplies including cold chain monitoring cards	Quotations from suppliers. Orders made out to suppliers. Invoice. Receipts	Timely procurement of supplies and equipment

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
Activity 3.1.2	Train all field veterinarians and para-professionals on the transportation, storage, dilution of vaccines, vaccination, marking and reporting work;	Number of field vaccination staff trained disaggregated by the type of training	Training report Trainees evaluation forms	MS assign qualified and well experienced experts to give the training
OUTPUT 3.2	Incidence of the PPR in the targeted population reduced	100 percent of the targeted small ruminant population vaccinated 80 percent post vaccination flock immunity attained	Vaccination forms Sero survey results	Collaboration from all stakeholders
Activity 3.2.1	Pre-vaccination sero-surveillance to establish baseline	Field survey conducted as per the survey design	Antibody prevalence study reports.	Proper interpretation survey data to guide targeted vaccination
Activity 3.2.2	Procurement and delivery of certified vaccine	Dose of vaccine procured All batches of vaccines comply with OIE quality requirements	Quotations from suppliers. Orders made out to suppliers. Invoice. Receipts Quality control certificates Delivery note	Vaccines manufacturing companies have the capacity to produce adequate vaccines in time. Storage capacities are available in the target areas.

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
Activity 3.2.3	Vaccination	Vaccination conducted in high risk areas Vaccination conducted during emergency outbreaks Proportion of vaccinated animals marked	Vaccination logs/ reports/records Signed vaccine delivery notes.	Government allow access to vaccination sites Governments are willing to collaborate with neighboring countries on implementing preventive and control measures The security situation is stable to allow effective vaccination Vaccines timely received in the targeted areas. Livestock farmers will allow their animals to be vaccinated. Veterinary services have funds and personnel available to run vaccination campaign.
Activity 3.2.4	Post vaccination evaluation	at least 80% of animals should have a serological titer to be considered protective at 21 or 28 days post PPR vaccination. monitor the entire vaccination chain the temperature along the cold chain is always between +2°C and +8°C. Decrease and progressive disappearance of PPR outbreaks assessed	Sero monitoring results Filed monitoring reports PDS results	The evaluation will be performed in line with standard protocols
Activity 3.2.5	Enhanced participatory disease search	Participatory disease search teams established in each MS Number of suspected PPR outbreaks investigated using PDS.	PDS reports	Use of adequately trained and equipped cadre of PDS practitioners

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
Activity 3.2.6	Outbreak investigation, confirmation and characterization	An outbreak investigation form designed Detected/reported out breaks Investigated (75% of PPR outbreaks are investigated). Carry out prompt preliminary precautionary measures within 3 days once a suspicion is raised Implement prompt measures within 3 days to contain virus spread once an outbreak is confirmed.	Outbreak investigation form Outbreak investigation report Laboratory report	The type of measures to be taken (animal movement restrictions, culling or emergency vaccination, or a combination of these) is a country policy choice
Activity 3.2.7	biosecurity improved	Number of meetings held by the specific Working Group on biosecurity in live markets and at farm level Number of site visits to those facilities to verify whether their biosafety/biosecurity conditions are adequate (target: at least, each facility is visited one time / year) Develop and disseminate awareness materials Organize sensitization meetings.	Minutes of meetings Sit visit reports Communication materials Reports of sensitization meetings	The PPR legal framework should be properly enforced to enforce adequate biosecurity.
OUTPUT 3.3: PPR CONTINGENCY PLANS DEVELOPED AND IMPLEMENTED	Contingency Plans developed and implemented	Number of contingency plans updated and tested	Contingency plans Simulation reports	MS fully support the implementation plan with adequate budget and resources
Activity 3.3.1	Develop the contingency plan	Develop a contingency plan and officially endorsed and approved by the Veterinary Authority	Official approval document	Governments are willing to endorse emergency plans
Activity 3.3.2	Regularly test its application through simulation exercise (desk and/or field)	At least one simulation exercise in each MS in at least one area recognized as cleared from the PPR virus	Records of testing of contingency plans (reports, etc.)	Availability of exercise evaluation Guide
Activity 3.3.3	Keep stock of PPR vaccine for contingency operation	Vaccine stock to vaccinate 5% of the eligible population	Vaccination logs/ reports/records	Vaccine bank established

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
OUTPUT 3.4	Other Small ruminant diseases prevalence reduced	Proportion of agreed/approved control plans for the prioritized SR diseases which are under implementation	Need more detail to be able to determine a data source	Governments continue to consider other small ruminant diseases as a priority
Activity 3.4.1	Identify other priority small ruminant disease for each member state	Priority diseases identified	List of priority diseases in each MS	
Activity 3.4.2	Undertake feasibility study to determine the tangible benefits of a combined program without compromising the PPR control and eradication.	Feasibility study carried out in each of the MS	Report on feasibility study	Should be considered cautiously as they could dilute the focus on PPR eradication.
Activity 3.4.3	Support the formulation and validation of a control plan	formulate/design and appropriate control plans for the prioritized Small ruminant diseases (SRD)	Template and guideline developed Template and guideline distributed to MS Control plan for prioritized diseases	Political commitment of MS to harmonize approaches in the control of other SR priority diseases
Activity 3.4.4	Implement control plan for the identified disease	Number of vaccinations done for targeted disease Proportion of eligible small ruminate vaccinated for targeted disease Incidence of targeted disease is greatly reduced	Vaccination logs/ reports/records Results of participatory impact assessment on disease prevalence	The distribution of the priority SR diseases geographically overlap with PPR distribution
Outcome 4: Stronger Veterinary Services in Support of PPR Control and Eradication Built		Proportion of MS that comply with OIE quality standards for veterinary services	OIE PVS evaluation reports Twinning reports	Governments are willing to comply with OIE quality standards
OUTPUT 4.1	Legal framework reinforced	VLSP missions to identify gaps in law followed by VLSP Agreements to draft needed laws.	VLSP Mission reports identify gaps and weaknesses in country legislation New legislation drafted to address gaps.	Governments are willing to enact legislation changes

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
Activity 4.1.1	Assessment of legal framework through OIE legislative support mission (identification mission)	Working Groups (involving competent authorities, legal experts and relevant stakeholders) established to evaluate gaps in the veterinary legislation with regard to PPR that may need to be addressed at least two working group meetings held every year Number of amendments proposed to update the PPR legal framework	OIE identification mission report Working group minutes and reports Assessment report	OIE support available to undertake the legal framework identification mission
Activity 4.1.2	Based on the finding, proceed to VLSP legislation agreement with the OIE (including stakeholder consultation)	VLSP Agreements to draft needed laws. 100% comments made by relevant stakeholders are responded	Signed agreement between OIE and MS OIE legislative mission report and recommendation Minutes of stakeholder consultation	OIE commitment to support VLSP agreements
Activity 4.1.3	Support the enactment and enforcement of the legislations through awareness creation at different levels	Number of PPR specific acts issued by the Veterinary Services in support of the field control Activities Number of proposals submitted to update the legal framework Number of awareness creation sessions	Laws enacted by MS Reports on awareness creation	From stage to stage, the country legal framework might need to be upgraded, notably to ensure that it supports efficient PPR prevention and control
Activity 4.1.4	Organize regional harmonization of veterinary legislation	Two seminars on regional harmonization of veterinary legislation Organize or undertake expert missions for IGAD region to identify areas for legislation improvement an harmonization	Seminar reports Expert mission report	MS commitment to harmonize veterinary strategy, including legislation and promote exchanges of information regarding animal health policies and strategies.
OUTPUT 4.2	Veterinary services strengthened	Selected PVS Critical Competencies relevant to PPR work improved	PVS evaluation reports	MS commitment to ensure quality of veterinary services

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
Activity 4.2.1	PVS evaluation (including gap analysis) for countries which have not done the evaluation and those who did the evaluation before five years need to request a follow up evaluation	Number of MS requested and carried out PVS Evaluation and/ or gap assessment (for those never perform PVS evaluation so far) Number of MS requested and carried out PVS follow up assessments (for those older than 5 years since they did PVS Evaluation)	PVS assessment report PVS gap analysis report	MS make official request for PVS evaluation
Activity 4.2.2	Regional level training on PVS evaluation tools for countries to build capacity on self-assessment	One training involving 16 persons (two from each MS)	Training report	Qualified trainers are deployed to undertake the ToT training on PVS evaluation
Activity 4.2.3	Support twinning programs (laboratory, statutory body and education)	Number of MS twinned for laboratory program Number of MS twinned for statutory body Number of MS twinned for veterinary education	Official request for OIE for twinning arrangement Official agreement for twinning Twinning reports	OIE commitment to support twinning arrangements
Activity 4.2.4	Support countries to request OIE laboratory mission	Number of OIE laboratory missions requested Number of laboratory missions carried out	MS official request to OIE Official agreement between OIE and MS OIE laboratory mission report	OIE commitment to support laboratory mission
Activity 4.2.5	Promote alternative veterinary services delivery model (sanitary mandate, CAHWs)	Number of sanitary mandates awarded to the private sector Number of CAHWs involved in PPR control in pastoral areas	Sanitary mandate contracts Vaccination monitoring reports	Government adopts policy that allows private sector role in vaccination and prepared to provide sanitary mandates to the private sector.
Outcome 5: Functional Coordination Framework for the Control and Eventual Eradication of PPR Established				High level political commitment at IGAD, National and sub national level will be ensured

	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
OUTPUT 5.1	Functional Coordination at sub-Regional and National level Established	Proportion of countries will all the set ups indicated below		Same as above
Activity 5.1.1	Establish functional coordination framework at national and sub national level	- Proportion of functional national project management offices established with in the ministry in charge of livestock - For bigger countries Branch coordination offices established to coordinate the program at sub national level - Countries that have established the three teams under the project management office: surveillance, disease investigation and operations established - Countries that have established PPR steering committee to oversee the implementation of the PPR.	Report Report Report and minutes	

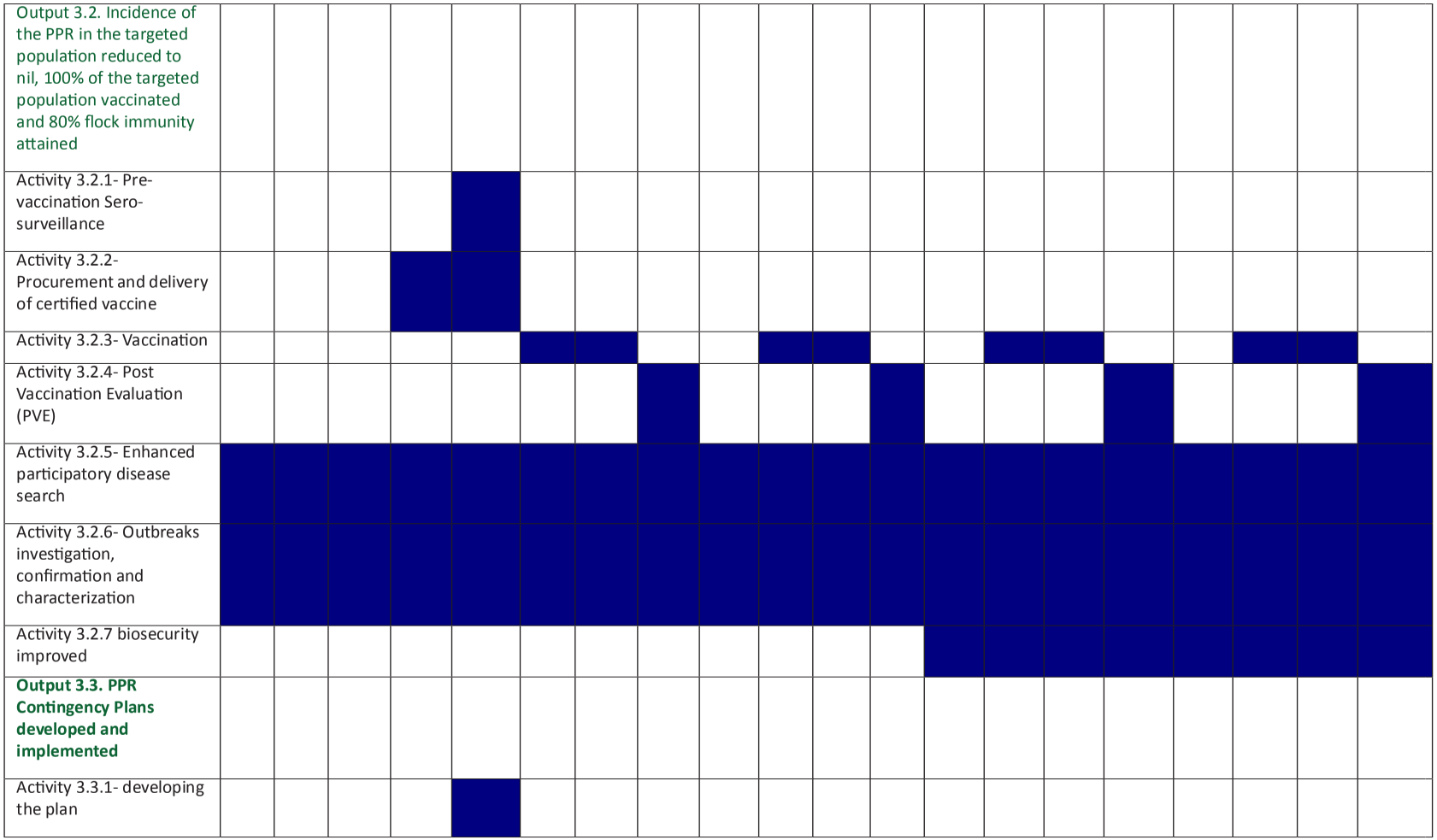
	Description	Measurable indicators of achievement / Targets*	Sources/Means of verification	Assumptions and Risks
Activity 5.1.2	- Establish functional coordination framework at the sub-region level	- sub-regional PPR control project management unit with in IGAD/ICPALD established. - Sub regional PPR control steering committee established - Sub-regional vaccine bank established - Functional linkage among the sub region project management unit, the sub-regional designated epidemiology centre and lead diagnostic laboratory and MS established - A roster of PPR experts to support program implementation prepared.	- Reports and existence of harmonized and well-coordinated PPR control program - The list of PPR experts	

Annex 2: Work plan

Outputs and activities	Year 1				Year 2				Year 3				Year 4				Year 5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Outcome 1 ***Surveillance and Laboratory Capacity for Early Detection and Diagnosis of PPR Built***																				
Output 1.1. Surveillance capacity built																				
Activity 1.1.1 Strengthening the National Animal Health Information System of MS - (general)																				
Activity 1.1.2 Improve the capacity of countries to plan and undertake PPR sero-surveillance and sero-monitoring																				
Activity 1.1.3 Improve the capcity of countries to undertake PPR Syndromic surveillance, PDS and outbreak investigation for early detection of cases/ outbreaks																				
Activity 1.1.4 Establish a formal sub-regional institutional set up for animal health information sharing among MS																				
Output 1.2 Laboratory capacity built																				

Activity 1.2.1. Asses the capacity building needs (facility, knowledge/skill and system) of national/ reference laboratories in each member states against the desired diagnostic capacity needs.																					
Activity 1.2.2. Build the capacity of national/ reference laboratories to enable them undertake quality assured tests for PPR and other SR diseases.																					
Activity 1.2.3. Establish a formal sub-regional institutional set up for providing diagnostic support and quality assurance to national/ reference laboratories in MS.																					
Outcome 2: Status of the disease in MS defined and clear intervention plan developed/ updated (Epidemiological assessment)																					
Output 2.1. Status of the disease defined																					
Activity 2.1.1- Develop national assessment plan																					
Activity 2.1.2- Conducting detailed assessment to know the exact status of PPR																					

Activity 2.1.3- Provide indications on the prevalence of other major SR diseases																				
Output 2.2. Intervention plans developed/ updated																				
Activity 2.2.1- Develop/ adjust country specific intervention plan																				
Activity 2.2.2- Regional analysis																				
Activity 2.2.3- Develop a harmonized plan based on the concepts of epidemiological zonation -epi-zones																				
Outcome 3: PPR Prevention and Control Capacity Built, Implemented and Incidence of the Disease Reduced																				
Output 3.1. *PPR Prevention and Control Capacity Built*																				
Activity 3.3.1.1- Training field vaccination team																				
Activity 3.1.2- logistics (camping equipment, vehicles, cold chain facilities procurement, cold-chain maintenance)																				


Output 3.2. Incidence of the PPR in the targeted population reduced to nil, 100% of the targeted population vaccinated and 80% flock immunity attained
Activity 3.2.1- Pre-vaccination Sero-surveillance
Activity 3.2.2- Procurement and delivery of certified vaccine
Activity 3.2.3- Vaccination
Activity 3.2.4- Post Vaccination Evaluation (PVE)
Activity 3.2.5- Enhanced participatory disease search
Activity 3.2.6- Outbreaks investigation, confirmation and characterization
Activity 3.2.7 biosecurity improved
Output 3.3. PPR Contingency Plans developed and implemented
Activity 3.3.1- developing the plan

Activity 3.3.2- regularly testing its application through simulation exercises (desk and/or field)																				
Activity 3.3.3- Keep stock of PPR vaccine for contingency operation (5% of the eligible pop)																				
Output 3.4. Other Small ruminant diseases prevalence reduced																				
Activity 3.4.1- Identify other priority small ruminant disease for each member state																				
Activity 3.4.2- Undertake feasibility study to determine the tangible benefits of a combined program without compromising the PPR control and eradication.																				
Activity 3.4.3- support the formulation and validation of a control plan (template and guideline will be developed and distributed to MS)																				
Activity 3.4.4- Implement control plan for the identified disease																				
Outcome 4: Stronger Veterinary Services in Support of PPR Control and Eradication Built																				

Output 4.1. Legal framework reinforced																				
Activity 4.1.1- Assessment of legal framework through OIE legislative support mission (identification mission)				■																
Activity 4.1.2- Based on the finding, proceed to VLSP legislation agreement with the OIE (including stakeholder consultation)					■															
Activity 4.1.3- Support the enactment and enforcement of the legislations through awareness creation at different levels						■	■	■												
Activity 4.1.4- Organize regional harmonization of veterinary legislation									■	■	■	■								
Output 4.2. Veterinary services strengthened																				
Activity 4.2.1- PVS evaluation (including gap analysis)					■				■											
Activity 4.2.2- Regional level training on PVS evaluation tools for countries to build capacity on self-assessment				■																
Activity 4.2.3- Support twinning programs (statutory and education)					■	■	■													

Activity 4.2.4- Support countries to request for OIE Laboratory mission																				
Activity 4.2.5- Promote alternative veterinary services delivery model (sanitary mandate, CAHWs etc.) as appropriate																				
Outcome 5: Functional Coordination Framework for the Control and Eventual Eradication of PPR Established																				
Output 5.1: Functional Coordination at sub-Regional and National level Established																				
Activity 5.1.1- Establish functional coordination framework at national and sub national level																				
- Establish national project management offices within the ministry in charge of livestock.																				
- For bigger countries Establish Branch coordination offices to coordinate the program at sub national level.																				

- Establish surveillance, disease investigation and operations teams under the project management office																				
- Establish PPR steering committee to oversee the implementation of the program.																				
Activity 5.1.2- Establish functional coordination framework at the sub-region level																				
- Establish sub-regional PPR control project management unit with in IGAD/ICPALD.																				
- Form sub regional PPR control steering committee.																				
- Establish Sub-regional vaccine bank																				
- Establish functional linkage among the sub region project management unit, the sub-regional designated epidemiology center and lead diagnostic laboratory and MS.																				
- Prepare a roster of PPR experts to support program implementation.																				

ANNEX 3: Budget

OUTPUTS AND ACTIVITIES	UNIT	QTY	RATE in USD	TOTAL (USD)	REMARK
Outcome 1 Surveillance and Laboratory Capacity for Early Detection and Diagnosis of PPR Built					
Output 1- Output 1.1. Surveillance capacity built				**25,215,000**	
Activity 1.1.1. Strengthening the National Animal Health Information System of MS - (general)				**4,104,500**	
- Countries infrastructure and system needs for running proper national Epidemio-surveillance system assessed (Somalia, South Sudan, Eritrea and Djibouti)	Consultancy to assess the gaps in man-days	30 man-days	450 /day	13,500	
- Based on the identified needs/ gaps and context of countries, appropriate Animal health information system developed/ adopted and deployed in all the four countries	Consultancy for system development in man-days	60 man-days	450 /day	27,000	
	No of countries to which the animal health information / surveillance system will be set up	4	750,000 / country	3,000,000	500,000 for set up and 50,000 for maintenance
- Countries in the sub-region with relatively better animal health information system (Ethiopia, Sudan, Kenya and Uganda) strengthened and harmonized.	No of countries to be strengthened	4	200,000 / country	800,000	

- Three national epidemiology staff from each country (totally 24) trained on basic epidemio-surveillance techniques (Data management and analysis, risk analysis, impact assessment, contingency planning, international trade regulations, value chain analysis and livestock economics.)	No of epidemiologists trained from the eight countries	24 per year for five years = 120	2,200 / trainee	264,000	24 people x [$400 for travel+ ($300DSA*6)-days] x 5 years = $264000. Trainers are from the FAO/IAEA
Activity 1.1.2. Improve the capacity of countries to plan and undertake PPR sero-surveillance and sero-monitoring				**2,011,400**	
- National and sub national sero-surveillance/ monitoring team established in each of the eight MS.	Eight national sero-surveillance/ monitoring team established	-	-	-	
- Two standard operating procedures, one for PPR sero-surveillance and the other for sero-monitoring, prepared.	Consultancy for preparing SOP for sero-surveillance and sero-monitoring in man days	20 man days	450/man day	9,000	450 USD/day
	Color Printing	4000 copies	10 /copy	40,000	10 USD/SOP

- Three epidemiologists from each member state (totally 24) trained on SoP ToT training organized at sub-region level and cascaded to the sub national level	No of epidemiologists trained as ToT	24*2= 48	1300/ trainee	62,400	Two times in five years for a period of two days for training and one day travel each= 24 people x [$400 for travel+ ($300DSA*3)-days] x 2 time in five years = $32400.
	Training at sub national level for 1080 veterinarians	1080 trainees + 120 trainers = 1200	250/trainee	300,000	Djibouti and Eritrea 12, Ethiopia and Sudan 48 and others 24 each every year for five years= 1080 trainees and 120 trainers. The training is for three days and the local DSA is 50 USD, travel expenses 100 USD
- The surveillance/ monitoring teams are equipped with the necessary facilities	Sets	32	50000/set	1,600,000	Djibouti and Eritrea 2 sets, Ethiopia and Sudan 6 sets and others(Kenya, Uganda, South Sudan and Somalia) 4 sets and each set costing 50,000 USD For details see annex----
Activity 1.1.3. Improve the capcity of countries to undertake PPR Syndromic surveillance, PDS and outbreak investigation for early detection of cases/outbreaks				**16,349,100**	

- Three manuals (PPR syndromic surveillance, participatory Epidemiology and Disease Investigation) and one video-clip on the disease progression prepared.	Consultancy to prepare three manual in man days (20 days each)	60 man days	450 /Man Day	27,000	
	Experimentally infecting sheep/ goats with PPRV and documenting the progression and syndromes (lump-sum)	1	18,100	18,100	- Will be carried out at the designated regional support/ lead lab - 20 sheep and goats are required and each costing 80 USD, feed labour for the experimental period is 100 USD each = 180USD each= 3600 USD - expert fee for documentation 300/USD/day for 15days= 4500 USD - Tests to be used estimated at 10,000 USD - Totally 18100
- National and sub national PDS and Disease/outbreak investigation team established in each of the eight MS.	-	-	-	-	

- All members of the national PDS and disease investigation team in each MS received hands on ToT training on PDS techniques, syndromic surveillance and outbreak investigation and cascaded to the sub national level	No of veterinarians trained on ToT - (3 from each country for five years)	120	2200 / trainee	264,000	8 countries * 3 trainees from each country = 24 people x [$400 for travel+ ($300DSA*6 days] x 5 years = $32400. Trainers are from the FAO/IAEA
	Cascaded to sub national level, total 1080 trainees in five years	1080 trainees + 120 trainers = 1200	400/trainee	480,000	Ethiopia and Sudan 16, Djibouti and Eritrea 4 and others 8 each and each team has three members every year for five years + trainers
	Each trainee at the sub national level will train 20 paraprofessionals on disease recognition every year	1080 *20 = 21600 (4320 paraprofession-als every year)	150/trainee	3,240,000	A one day training DSA for one training day and one travel day totally 2 days DSA = 50 USD/day and transport cost 50 USD totally 150 USD per person
- Producers and other value chain actors trained on disease recognition	Each animal health technician will train 200 value chain actors every year in his/ her vicinity	21600	200/AHT/ Year	4,320,000	Training material 200 USD /AHT/Year
	Airtime for TV and Radio	No of countries (8)	1,000,000/ country	8,000,000	200,000 USD per country per year for the TV and radio air time for five years 1,000,000 USD
Activity 1.1.4. Establish a formal sub-regional institutional set up for animal health information sharing among MS				**2,750,000**	
- A Sub-Regional Leading Epidemiology Centre designated and capacitated	Capacity building of the epidemiology staff (10) in the designated center	100	2500/ trainee	250,000	10 people x [$400 + ($300*7)-days] x 2 times x 5 years = $250,000.
	Equipping the center with the necessary hard and software	set	1,000,000/ center	1,000,000	

- A sub-regional disease information system /database established	No established (at the designated center)	1	1,000,000/ database	1,000,000	Assumptions are from the global strategy (USD 500,000 for the initial set up and 100,000 for maintenance every year for five years)
- Existing national and sub-regional epidemiological networks strengthened	No of participants (2*20 = 40 per year)	200 (five years)	2500/ participant	500,000	20 people x [$400 + ($300*7)-days] x 2 times x 5 years = $500,000.
Output 1.2 Laboratory capacity built				**17,424,000**	
Activity 1.2.1. Asses the capacity building needs (facility, knowledge/skill and system) of national/ reference laboratories in each member states against the desired diagnostic capacity				**27,000**	
- Capcity building needs of reference laboratories in all member states assessed	Consultancy to assess the capacity building needs of national reference laboratories in man-days	60 man days	450 /man day	27000	
Activity 1.2.2. Build the capacity of national/ reference laboratories to enable them undertake quality assured tests for PPR and other SR diseases indicated above				**15,941,000**	

- 8 reference laboratories (one in Each MSs) well equipped and capable of undertaking PPR diagnosis	Diagnostic Equipment (PCR, ELISA and other necessary facilities for viral isolation – 8 set -one for each country)	8stes	1,000,000/ set	8,000,000	
	Laboratory test kits (PCR, ELISA, VI and including pen side)	8sets	750,000/set	6,000,000	–lab test kits (PCR, ELISA, VI) for eight reference laboratories = 8 laboratories/one in each country/ x $150,000 x 5 years = $6,000,000.
	Capacitating satellite laboratories in bigger MS to process samples for the reference labs (4 in Ethiopia and 4 in Sudan)	8	150,000/sat lab	1,200,000	
- A manual on laboratory techniques and sampling based on the gaps identified prepared	Consultancy to prepare the manual in man days	20 man days	450 /man day	9,000	
- Sub-regional ToT training with the support of FAO/ IAEA organized and 24 laboratory experts(three from each country) trained based on the manual prepared and cascaded to the national and subnational labs and on sample collection, handling and shipment to field staff	ToT training for 24 laboratory experts (three from each MS) per year= (24*5)=120	120	2,500 / trainee	300,000	Three experts from each country trained every year for seven days= [$400 transport cost+(6 days training +1 travel day) * 300 USD]*5 = $12,500
- Quality management system in all the reference laboratories (one in each MS) installed	Technical support to 8 reference labs (one in each country) 90 days each - in man days	720 man days	600 /man-day	432,000	8 reference laboratories * 90 days technical consultancy support for each lab distributed over 12 months * 600 USD/day

Activity 1.2.3. Establish a formal sub-regional institutional set up for providing diagnostic support and quality assurance to national/ reference laboratories in MS				**1,456,000**	
- A Sub-Regional Support/Lead laboratory designated and capacity of the designated sub-regional laboratory to provide support to MS and undertake virus characterization built	Equipping the designated support lab with facilities for virus characterization	1 set	500,000/set	500,000	Other aspects of the training are covered by the reference lab training above as it is also one of the reference labs in one the MSs. Here only equipping is considered.
	Capacitating the laboratory staff (60 days training for 2 laboratory staff every year)	10 experts	25400/ trainee	254,000	FAO/IAEA organize the training = (1400 travel fee +(60 days*400) =25400 10 trainees in five years
	Support missions to national reference laboratories provided	2 missions/ country/year= 16 and in 5 years= 80	1900/ mission	152,000	– Support missions to national laboratories by eight laboratory experts twice a year. 8 people x [$400 + ($300*5-days)] x 2 times x 5 years = $152,000.
- The designated support laboratory twinned with one of the FAO/OIE PPR world reference laboratories	Lump-sum	-	-	50,000	
- Existing national and sub-regional laboratory networks strengthened	No of participants (20 participants * 2 times a year = 40 per year)	200 (in five years)	2500/ participant	500,000	20 people x [$400 + ($300*7)-days] x 2 times x 5 years = $500,000.
Outcome 2: Status of the disease in MS defined and clear intervention plan developed/ updated (Epidemiological assessment)					

Output 2.1. Status of the disease defined				**1,040,000**	
Activity 2.1.1- Develop national assessment plan	A national expert team	8	10,000/ country	80,000	
Activity 2.1.2- Conducting detailed assessment to know the exact status (distribution, hotspots and risk pathways identification) of the disease in each MS which will also serve as bench mark	Number of surveys	8	100,000/ country	800,000	
Activity 2.1.3- Provide indications on the prevalence of other major SR diseases	A participatory rapid appraisal in each of the countries	8	20,000/ county	160,000	
Output 2.2. Intervention plans developed/updated				**280,000**	
Activity 2.2.1- Develop/ adjust country specific intervention plan	Expert team for each country	8	10,000/ country	80,000	
Activity 2.2.2- Regional analysis	Organizing Regional road map meetings once a year	5	20000/year	100,000	Regional road map meeting meetings: 20 people x ($400 + $300*2-days) x 1 time x 5 years = $100,000.
Activity 2.2.3- Develop a harmonized plan based on the concepts of epidemiological zonation -epi-zones	Organize bilateral harmonization meetings between countries 2 meetings per year	10	20000/year	100,000	Bilateral harmonization meetings: 10 people x ($400+$300*2 days) x 2 time x 5year
Outcome 3: PPR Prevention and Control Capacity Built, Implemented and Incidence of the Disease Reduced					
Output 3.1. *PPR Prevention and Control Capacity Built*				**12,912,500**	

Activity 3.1.1- Training field vaccination team b. Train all field veterinarians and para-professionals on the transportation, storage, dilution and administration of vaccines, marking of vaccinated animals and reporting work;					
- Familiarize all field veterinarians and para-professionals in the project area with vaccination strategy at least on an annual basis.	Training at sub national level for 1080 veterinarians	3000 trainees + 150 trainers = 3150	150/trainee	472,500	3000 trainees and 150 trainers. The training is for one day and the local DSA is 50 USD, travel expenses 100 USD
- Train field vaccination teams on the transportation, storage, dilution and administration of vaccines, marking of vaccinated animals and reporting work;	Training at sub national level for 1500 veterinarians	1500 trainees + 120 trainers = 1620	250/trainee	405,000	1500 trainees and 120 trainers. The training is for three days and the local DSA is 50 USD, travel expenses 100 USD
Activity 3.1.2- logistics (camping equipment, vehicles, cold chain facilities procurement, cold-chain maintenance)					
- Vehicles hard top for lab and surveillance	Number (6 for each country)	48 vehicles	45,000 USD	2,160,000	
-Field vaccination vehicles	1 vehicle per 3 vaccination teams	140 vehicles	32,000 USD	4,480,000	415 vaccination teams. Double cabin pickups
-Vaccination and camping equipment	Set per vaccination team	415	13,000 USD	5,395,000	
Output 3.2. Incidence of the PPR in the targeted population reduced to nil, 100 % of the targeted population vaccinated and 80 % flock immunity attained)				100,264,813	
Activity 3.2.1- Pre-vaccination Sero-surveillance					

- Sample collection	Number of sample 6000 sera samples per country	48,000	1.5 USD	72,000	Inclusive of all the cost involved except the testing
- Sample testing	Sample	48,000	1.5 USD	72,000	
Activity 3.2.2- Procurement and delivery of certified vaccine	Dose of vaccine	291,654,810	.025 USD	7,291,370	
Activity 3.2.3- Vaccination	Animal	291,654,810	.30 USD	87,496,443	Inclusive of all costs except the vaccine
Activity 3.2.4- Post Vaccination Evaluation (PVE)					
- Sample collection	Number of samples	96,000	1.5 USD	144,000	a single survey is performed per stage. It is assumed that 6,000 samples are taken per survey.
- Sample testing	Number of samples	96,000	1.5 USD	144,000	
Activity 3.2.5- Enhanced participatory disease search	Number PDS teams 50 teams x 5 year	250	5000/PDS team	1,250,000	
Activity 3.2.6- Outbreaks investigation, confirmation and characterization	Number of outbreaks	3065	1000/ outbreak	3,065,000	Year1 -5 outbreak/500,000 Year 2 -3 outbreak/500000 Year 3 -2 outbreaks/500,000 Year 4- 1 outbreak/500,000
Activity 3.2.7 Biosecurity improved					
Number of meetings held by the specific Working Group on biosecurity in live markets and at farm level	Biosecurity meetings 2 per country	16	5,000/ meeting	80,000	
-Number of site visits to those facilities to verify whether their biosafety/biosecurity conditions are adequate	Number of visits	50	1000/visit	50,000	

-Develop and disseminate awareness materials	Lump sum	-	-	100,000	
-Organize sensitization meetings.	Number of sensitization meetings	50	10,000/ meeting	500,000	
Output 3.3. PPR Contingency Plans developed and implemented				**559,000**	
Activity 3.3.1- developing the plan	A national expert team	8	10,000/ country	80,000	
Activity 3.3.2- regularly testing its application through simulation exercises (desk and/ or field)					
- Table top simulation	Number of table top simulation	16	200/ participant	64,000	20 participant per simulation A two day simulation exercise DSA for two days and one travel day totally 3 days DSA = 50 USD/day and transport cost 50 USD totally 200 USD per person 20x200x16= 64,000
- O- One field level simulation	One field simulation at sub regional level	1	50,000/field simulation	50,000	
Activity 3.3.3- Keep stock of PPR vaccine for contingency operation (5% of the eligible pop)	Dose of vaccine	14,600,000	.025/dose	365,000	5% of eligible population
Output 3.4. Other Small ruminant diseases prevalence reduced				**107,000**	
Activity 3.4.1- Identify other priority small ruminant disease for each member state	National workshops to identify or update priority small ruminant diseases	8	10,000/ workshop	80,000	
Activity 3.4.2- Undertake feasibility study to determine the tangible benefits of a combined program without compromising the PPR control and eradication.	Consultancy to undertake feasibility study in man-days	30 man-days	450 /day	13,500	Consultancy to undertake feasibility study in man-days

Activity 3.4.3- support the formulation and validation of a control plan (template and guideline will be developed and distributed to MS)	Consultancy to develop template and guideline in man-days	30 man-days	450 /day	13,500	Consultancy to develop template and guideline in man-days
Activity 3.4.4- Implement control plan for the identified disease					Budget not foreseen in this programme
Outcome 4: Stronger Veterinary Services in Support of PPR Control and Eradication Built					
Output 4.1. Legal framework reinforced				**742,400**	
Activity 4.1.1- Assessment of legal framework through OIE legislative support mission (identification mission)	Consultancy to carry out OIE laboratory mission	160 man days	450/man day	72,000	20 man days for each country
Activity 4.1.2- Based on the finding, proceed to VLSP legislation agreement with the OIE (including stakeholder consultation)	Consultancy to carry out VLSP	320 man days	450/man day	144,000	40 man days for each of the countries
Activity 4.1.3- Support the enactment and enforcement of the legislations through awareness creation at different levels	Number of awareness creation meetings on legislations	50	10,000/ meeting	500,000	
Activity 4.1.4- Organize regional harmonization of veterinary legislation	3 participants from each of the countries for workshop to harmonize legislation	24	2,200 / trainee	26,400	24 people x [$400 for travel+ ($300DSA*3)-days] = $26,400.
Output 4.2. Veterinary services strengthened				**1,068,800**	

Activity 4.2.1- PVS evaluation (including gap analysis)- for countries which haven't done the evaluation and those who did the evaluation before five years need to request a follow up evaluation.	Consultancy to carry out PVS evaluation in man-days	320 man days	450/man day	144,000	40 man days for each country (20 man days for PVS and 20 man days for Gap assessment)
Activity 4.2.2- Regional level training on PVS evaluation tools for countries to build capacity on self-assessment	3 trainees from each country 24 trainees	24	2,200 / trainee	52,800	24 people x [$400 for travel+ ($300DSA*6)-days] = $52,800. Trainers are from OIE
Activity 4.2.3- Support twinning programs (laboratory, statutory and education)	Number of twinning arrangements	16	50,000/ twinning	800,000	
Activity 4.2.4- Support countries to request for OIE Laboratory mission	Consultancy to carry out OIE laboratory mission	160 man days	450/man day	72,000	20 man days for each country
Activity 4.2.5- Promote alternative veterinary services delivery model (sanitary mandate, CAHWs etc.) as appropriate	Letter of Agreement with private operators				To be covered from the vaccination budget

Outcome 5: Functional Coordination Framework for the Control and Eventual Eradication of PPR Established					
Output 5.1. Functional Coordination at sub-Regional and National level Established				**4,869,000**	
Activity 5.1.1. Establish functional coordination framework at national and sub national level				**3,436,000**	
- National project management office with in the ministry in charge of livestock established	Equipping and furnishing the project office (set)	8	33,000/ country office	264,000	Staff for the project coordination office is assumed to be seconded from the ministry in charge. Here only top ups of 1000 USD/Month for the coordinator and 500USD/ month for others is considered
- For bigger countries Branch coordination office to coordinate the program at sub national level	Equipping Branch coordination offices for Sudan and Ethiopia (8 each)	16	16500/ branch co office	132000	
- Three teams under the project management office: surveillance, disease investigation and operations established	Top ups for the coordinator and 9 experts (three members in each team).	8 (for the 9 experts)	270,000/ country	2,160,000	Top up 500 USD/ Month= 6000 per year and in five years 30,000 per per person. For 9 experts 270,000 USD per country.
		8 (for the coordinator)	60,000/ country	480,000	For the coordinator= Top up 1000 USD/Month = 12000 USD and in five years 60,000 USD
- Establish PPR steering committee to oversee the implementation of the PPR established	Organizing national steering committee meetings twice a year	8	50,000/ country	400,000	National Steering Committee (SC) meetings: 20 people x ($150 transport + $50*2-days) x 2 time x 5 years = $50,000.
Activity 5.1.2. Establish functional coordination framework at the sub-region level				**1,333,000**	

- sub-regional PPR control project management unit with in IGAD/ICPALD established.	Salary for the coordinator and deputy coordinator at the IGAD/ICPALD level.	2	420,000/ person	840,000	Salary for a senior expert 7000 USD/ Month for five years = 7000*12*5= 420,000
	Equipping and furnishing the project office (set)	1	33,000/set	33,000	
- Sub regional PPR control steering committee established	Organizing Regional steering committee meetings once a year	5	20000/year	100,000	Regional Steering Committee (SC) meetings: 20 people x ($400 + $300*2-days) x 1 time x 5 years = $100,000.
- Sub-regional vaccine bank established	Establishing a cold store for PPR vaccine in one of the vaccine producing facilities in the region	2	100,000/ cold room	200,000	
- Functional linkage among the sub region project management unit, the sub-regional designated epidemiology center and lead diagnostic laboratory and MS established	Regional PCP meeting once in a year for three days	5	32000/year	160,000	Regional PCP meetings: 20 people x ($400 + $400*3-days) x 1 time x 5 years = $160,000.
- A roster of PPR experts to support program implementation prepared	One Roster	-	-	-	-

ANNEX 4: Examples of epi-zones in the IGAD region

Epizones	Target countries	Remark
Somalia ecosystem	Djibouti, Ethiopia, Eritrea, Kenya, Somalia	
Karamojong ecosystem	Kenya, South Sudan, Uganda	
Afar Ecosystem	Djibouti, Eritrea and Ethiopia	
Nile Ecosystem	Ethiopia, South Sudan and Sudan	
Maasai Ecosystem	Kenya and Tanzania	Involving countries out of IGAD
Darfur Ecosystem	Sudan, South Sudan, Central Africa and Chad	Involving countries out of IGAD

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