

UNITED REPUBLIC OF TANZANIA



MINISTRY OF AGRICULTURE, LIVESTOCK AND FISHERIES

**NATIONAL PPR CONTROL AND ERADICATION STRATEGY
FOR TANZANIA**

2017 – 2030

JULY, 2017

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EXECUTIVE SUMMARY

Goats and sheep represent the second and third largest proportion of the livestock population in Tanzania, respectively. Tanzania's small ruminant wealth based on 2017/18 budget speech included 17 million goats and 5 million sheep. The majorities of these livestock species are indigenous breeds and are vital component of the mixed farming system where they are used for various purposes i.e. source of income and providing milk and meat. In addition to this important economic role, sheep and goats have significant role in socio-cultural activities such as funerals, dowries, festivals and holidays, etc. More than 99% of this livestock are kept in low-input low-output systems, owned and managed by 1,732,863 low income mixed and pastoral households who operate under traditional husbandry system, often with little or no access to informed and relevant animal production advice or reliable veterinary services.

Tanzania government's policy on increasing the output of animal products and improving productivity is significantly hampered by several constraints, especially infectious and non infectious diseases. Of the infectious diseases of small ruminants, PPR is considered as major constraint in small ruminant development in recent years. *Peste des Petits Ruminants* (PPR) is a highly contagious disease of wild and domestic small ruminants caused by a virus that belongs to the genus *Morbillivirus* in the family Paramyxoviridae of the same family as the one causing rinderpest. Conservative loss estimates following disease incursion in Tanzania indicated that at household level TZS 335,420 (US\$ 233.6) could not be earned due to PPR and in total TZS 735,820 (490.6 US\$) were lost due to mortality and forgone revenue. The cumulative loss due to PPR was estimated to be around TZS 101.8 billion (US\$ 67.9 million). When ranking the losses with respect to total economic losses, mortality losses contributed the highest (74 percent), followed by treatment and vaccination costs that both accounted for 13 percent.

After the successful global eradication of rinderpest, in 2011 the World Organisation for Animal Health (OIE) and the United Nations Food and Agriculture Organization (FAO) started to discuss the possibility of PPR progressive control leading to eradication and then formed a PPR working group. In March 2015, OIE and FAO officially launched a new programme to eradicate PPR by 2030 and presented a global control and eradication strategy. Since adoption of the World Animal Health Terrestrial codes, Tanzania has been monitoring implementation of its core capacities using the “**OIE -PVS Evaluation**” tool and submitting reports to OIE on an annual basis. Over the last couple of years, 4 Veterinary Service performance evaluations Mission have been invited and assess Veterinary capacity across 47 Technical Areas. The findings demonstrated that although there has been significant progress, gaps still exist in key core capacities for the country to prevent, detect and respond to Animal health emergencies and service provision. No core capacity has attained sustainable capacity (score 5), and the majority lies between limited to minimum OIE capacity (score 2 to 3). Development and organisation of this plan has taken into account the recommendation of the previous OIE-PVS evaluation mission reports, gaps identified and the deliberations of the 2015 OIE/FAO PPR eradication strategy which encourage high stakeholders engagement from the plan development process to the implementation and monitoring stage. The additional key element of the global eradication efforts is the need to upscale control initiatives by improving Veterinary Services and the inclusion of other small ruminant diseases (SRDs) which are equally important constraint to small ruminant production.

The plan will align all activities with the “**Regional, Continental and Global eradication effort**” and broader Veterinary Service strengthening with full small ruminant value chain involvement; map and mobilize existing and potential domestic and external financing to

support the delivery of the national action plan and strengthen institutional framework to support production and Animal Health service provision.

The implementation of the plan will consider a set of guiding principles and core values such as country ownership and leadership; community participation; strengthening partnerships; fostering inter-sectoral collaboration; evidence-led; shared responsibility; resilience and dynamism. This plan will cover key core 4 component areas i.e. **Enabling environment promotion; Support to the diagnostic and surveillance systems; Measures toward PPR eradication as well as Coordination, Management and partnerships.**

Funds for implementation of the plan will come from domestic sources as well as from development partners. The National PPR coordinator to be appointed and PPR Advisory committee composed of representatives from small ruminant production value chain, and as well with co-opted members from development partners will be a coordination platform, anchored under the guidance of the PS, Ministry of Agriculture, Livestock and Fisheries. This committee will administer the plan, and monitor and evaluate its implementation.

Progress towards the attainment of the targets set out in this national action plan will be evaluated quarterly, annually, at midterm and end term. Data will be collected through surveillance systems, annual reviews/assessments and reporting, after action reviews, exercises and simulations and joint external evaluations and other relevant assessments like the PVS, as well as periodic supervision and structured surveys/assessments. For some technical areas, there will be a need to reconceptualise and re-organise the managerial and support mechanisms and structures at national, sub-national and local levels, including defining a clear supervisory mechanism, roles of the various decentralized levels and the community. Additionally, evaluation of the entire eradication efforts and Veterinary Services will be based on PMAT tool that has been developed and agreed globally reflecting all required 33 OIE key minimum competencies. **The implementation plan for the strategy has been developed indicating activities, implementers and expected outputs.** In addition, the plan indicates budget estimates required to support implementation of this strategy. The strategy will be implemented over the period of 13 years, covering 3 key control phases with an indicative budget amounting to **Tshs 36, 557, 364,800.**

CHAPTER 1 : BACKGROUND

1.1 Introduction

Peste des petits ruminants (PPR) is a highly contagious virus that causes disease in domestic sheep and goats and wild caprines, and can infect a wide range of wild animal species. PPR virus (PPRV) is a morbillivirus and is closely related to measles virus of humans and rinderpest virus of cattle, which was recently eradicated. In naïve populations it can cause morbidity and mortality of up to 100%, while in endemic or previously exposed populations median morbidity is 30% (ranging from 3 to 100%) and median mortality is 13% (ranging from 0 to 63%) (Jones *et al.*, 2016). Losses are incurred due to drop in milk production, abortion, loss of body condition and death. The severity of outbreaks varies depending on the virus strain, the susceptibility of different species and breeds of sheep and goats, previous exposure of the population and level of flock immunity, and presence of co-infections that are exacerbated by the immune-suppressive effect of PPR.

1.2 Purpose

The purpose of this strategy is to elaborate course of action and milestone as Tanzania strive toward PPR eradication by 2030. The document describe a country framework for the control and eradication of Peste des Petits Ruminants (PPR). Further, it augment and catalyze other ongoing initiatives geared toward controlling other country specific priority small ruminant diseases (SRDs) such as sheep and goat pox (SGP) and Contagious Caprine Pleuropneumonia (CCPP).

1.3 Alignment to the Global, Pan African, regional and national strategies

PPR is one of the priority diseases identified in the Global framework for Trans-boundary Animal Diseases (GF-TADs) 5 Year Action Plan for 2013-2017. The plan is aligned to the Regional (EAC & SADC & IGAD), continental (AU-IBAR) and the global strategy for the control and eradication of PPR that was jointly launched by the Food and Agriculture Organization (FAO) of the United nation and World Animal Health Organization (OIE) in Abidjan, April 2015. By nature and to bring synergies, Tanzania PPR National control strategy is going to be linked with many on-going initiatives across all levels and this include;

- The livestock industry development vision, based on the Tanzania Development Vision 2025, which states that:
“By year 2025, there should be a livestock sector, which to a large extent shall be commercially run, modern and sustainable, using improved and highly productive livestock to ensure food security, improved income for the household and the nation while conserving the environment”
- The livestock industry mission which is:
“To ensure that livestock resource is developed and managed sustainably for economic growth and improved human livelihood
- The National Livestock Policy (NLP) statements on TADs control which include the following :
 - The Government will strengthen technical support services on TADs control and eradication.

- The Government in collaboration with other stakeholders will encourage and promote investment in production of veterinary vaccines and other livestock inputs.
 - The Government will strengthen infrastructure for the control of TADs
 - Efforts will be made to harmonize national and international policies on TADs control and eradication
- Livestock Sector Development Strategy of 2010
- National Strategy for Growth and Poverty Reduction which aligns with key core values of equity, gender and other social economic indicators
- On going research projects and programs addressing Animal health threats
 - Southern Africa Centre for Infectious Diseases (SACIDs) –mobile technology and repository of animal disease data and community surveillance
 - PPR epidemiology and infection biology (2013-6402 & 2014-4293), and transboundary infectious diseases in sheep and goats (2016-05667), funded by Sweedish Research Council(SRC).

1.4 The design process

Participatory approaches involving technical team from the Director of Veterinary Services, Zonal Veterinary Investigation Centres(ZVCs), Tanzania Veterinary Laboratory Agency(TVLA), Tanzania Livestock Research Institute(TALIRI) as well personnel from development partners working in animal health sector participated in preparing this strategy. The strategy has been informed by available consultancies reports, FAO-TCP project reports, Research reports(Understanding of the Epidemiology of Peste-des-Petits Ruminants in livestock –wildlife interface project led by The Pirbright Institute (BB/L013657/1) and the Royal Veterinary College (BB/L013592/1), country disease control policies and priorities, scientific information and evidence, various consultative processes amongst key Tanzania livestock industry stakeholders including Professional Association, Tanzania consumers Advocacy Society, regional and country FAO offices and continental stakeholders and collective years of experiences in the control of epidemic diseases particularly the eradication of rinderpest. Other consulted information include OIE reference documents and GF-TADs. To articulate sense of ownership, meeting (national and regional) inputs from various stakeholders were tapped to enrich this plan.

2.1 The context

2.1.1 Basic information on the country

Tanzania, officially the **United Republic of Tanzania (URT)**, is a country in East Africa in the Great Lakes region and lies between 3°S and 12°S and 26°E and 41°E. It borders the Indian Ocean to the East (800km), and has a long international border of approximately 3,900 km shared with eight countries including Kenya (796 km) and Uganda (396 km) to the North, Rwanda (217 km), Burundi (451 km), the Democratic Republic of Congo (478 km) to the West, Zambia (338 km) to the South West, Malawi (475 km) and Mozambique (750 km) to the South. The total area including inland water and Zanzibar is 947,303 km², of which 886,040 km² is land and 62,050 km² is water (Lake, 2013). Tanzania is the 13th largest country in Africa and the 31st largest in the world. The climate varies with geographical zones: tropical on the coast where it is hot and humid (rainy season March-May); semi-temperate in the mountains with short rains November-December and long rains February – May; while it is drier in the plateau region with considerable seasonal variations in temperature. Total rainfall increases towards the north around Lake Victoria. Rainfall is well distributed throughout the year reaching its peak during the period of March through May. Such diverse climate influence widely distribution of animals and wildlife.

Administratively, Tanzania is divided into thirty one regions; twenty-six on the mainland and five in Zanzibar (three on Unguja, two on Pemba). In total, there are 185 Local Government Authorities (LGA's). Of these, 34 LGA's are urban units, which are further classified into five city councils (Dar es Salaam, Arusha, Tanga, Mbeya, and Mwanza), 19 municipal councils, and 12 town councils.

Since 1986, the government has undergone several reforms in sectors, including Public, Agriculture and Local government. The Public Sector reforms identify functions that will continue to be provided by the central government and those that can best be performed by other actors, such as local governments, service boards, executive agencies, NGOs and the private sectors. Sectors involved in animal health activities function at both the national and local governments. Within the devolved governance, veterinary services are managed under the Ministry of Agriculture, Livestock and Fisheries (MALF) at the national level and at sub national (regional, districts) level, by the President's Office Regional and Local Administration (PO-RALG), while the wildlife service is managed by the Ministry of Natural Resources and Tourism (MNRT). Affiliated institutions or agencies within each respective ministry provide technical support. Such agencies and institutions include Tanzania Veterinary Laboratory Agency (TVLA), Tanzania Livestock Research Institute (TALIRI), Tanzania Wildlife Research Institute (TAWIRI), Tanzania National Parks Authority (TANAPA) and Ngorongoro Conservation Area Authority (NCAA).

smallholder, agropastoral or pastoral systems. Distribution of small ruminants is fairly even, however, high concentration is found in the Northern, Lake and Central zones of the country (Figure 2ab). Distribution by each LGA's is shown in annex 6.

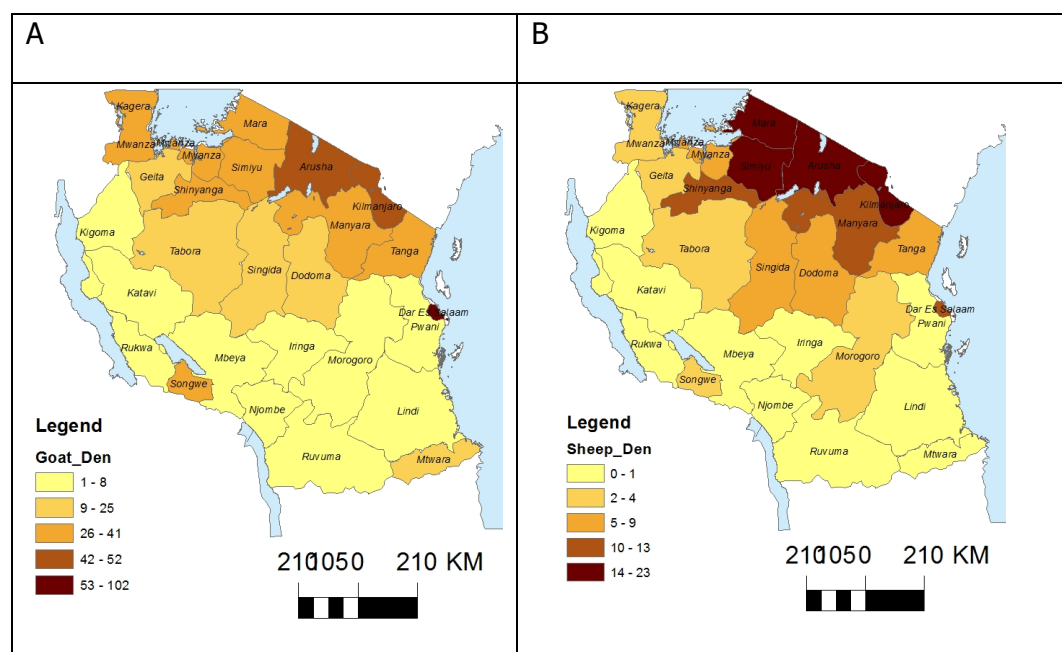


Figure 2 Sheep density by region

Figure 3 Goats density by region

Other reasons for the even distribution of small ruminants in Tanzania are their special attributes which include smaller value, ability to adapt to different environments and high rate of reproduction. Small ruminants are an important component of pastoral coping mechanism and easily supported to rebuild herds after environmental and political shocks.

2.1.3.1 Susceptibility, innate and passive immunity to PPRV

Predominant goats breeds and ecotype in Tanzania include East African short breed, Sonjo, Pare, Sumbawanga ecotypes. Other improved breeds include exotic (Saanen, Toggerburg) and crosses of these with indigenous breeds. Breeds of goats show varying degrees of resistance to PPR. Maternal immunity provides protection for 3–4 months. Infection with PPR provides lifelong immunity in recovered animals.

Sheep and goats are the most susceptible animal species with goats suffering a more severe clinical disease than sheep. Cattle, camels and pigs are usually infected without showing clinical signs and are not known to transmit the disease to other animals. In Tanzania, no PPR clinical disease has so far been detected in wildlife, but PPR infection appears to be widespread based on antibody detection in many wild species, in some cases at high prevalence. Based on recent research results undertaken in the Serengeti ecosystem and elsewhere (Mahapatra et al 2015) there are likelihood of spill-over of PPRV between small ruminants and wild animals. However, it is not clear whether wild animals are dead-end hosts in which the virus burns out, or bridging hosts where virus is transmitted within the wildlife population with subsequent spill-back into domestic populations helping to maintain the virus in the ecosystem, or maintenance hosts where the virus is transmitted and maintained in the wild population even if there is no further spill-over from domestic populations. This

uncertainty is of particular importance in many livestock-wildlife ecosystems where regular contacts between wildlife and domestic livestock are common.

Transmission of this PPRV from infected animals to susceptible animals requires many hours of close contact. Consequently, common grazing areas and markets are important in the spread of the disease. Most infection is through short-range aerosol from sneezing and coughing. Infection is primarily acquired via the respiratory system. Infected animals shed virus in expired air, and in all secretions and excretions at the onset of the fever and in the faeces at the onset of diarrhoea. The virus is fragile so that indirect transmission of virus is unlikely, either by animate or inanimate vectors.

2.1.4 PPR Risk factors along the small ruminants' value chain

Sheep and goats are important assets for smallholder farmers, and these animals often enter the formal economy only to a limited extent. The link between production systems, watering points, markets, slaughter points and consumers collectively constitute a “contact network” that provide an ideal opportunities for diseases transmission within herds/flock and between herds located at different geographical localities. The predominant production system in Tanzania pastoral is characterised by extensive animal mobility due various reason including disease avoidance and search for pasture and water especially during drought period. Disease risk factors related to animal and their products movement along the value chains are numerous and may include; presence of vulnerable unvaccinated stock; presence of disease incubating stock; movement of animals from infected area to clean area; movement of animals from the neighbouring infected countries through the country porous borders, among others. Reinforcement of animal movement along these risk points well supported by public awareness and legal instruments will be critical in control of PPR.

Marketing of live animals in the country takes place in primary, secondary and border livestock markets located close to main production areas. Often times, animals are either sold to traders or brokers at farm gate. The trading is done on negotiation between buyers and sellers with less consideration of grade. Trader/ broker will take the animal either to slaughter slabs/houses or to the secondary market or individual premises located at nearby village, districts, region for breeding or slaughter. Informal(home, market place and road side) slaughters for rituals, recreation and during festive are common in many livestock keeping communities in Tanzania. Once slaughter has been done, meat is transported to the butcheries, hotels, private consumers by the animal owners or through meat traders using certified or non certified meat vans. In intensive production system exchange of cows for small ruminants for flock expansion and borrowing bucks and rams for breeding purposes is common. Manure trade among small ruminant production communities is not often done.

The long distance movement of livestock and wild animals for grazing increases during the drought periods leading to high contact rates between livestock and wildlife at watering points. Besides, there are increased animal movements for slaughter around the end of the year and the time of religious festivals. During that time, animals are immuno-compromised because of insufficient water, pastures and long distance movement. It is at this time when animals from different places come into contact thereby increasing the risk of spreading the TADs. It is also at this time when livestock are grazed illegally in game reserves and national parks resulting in livestock coming into contact with wild animals which are considered to be carriers of most TADs. Detailed value chain analysis for sheep and goats is shown in Fig 3 below.

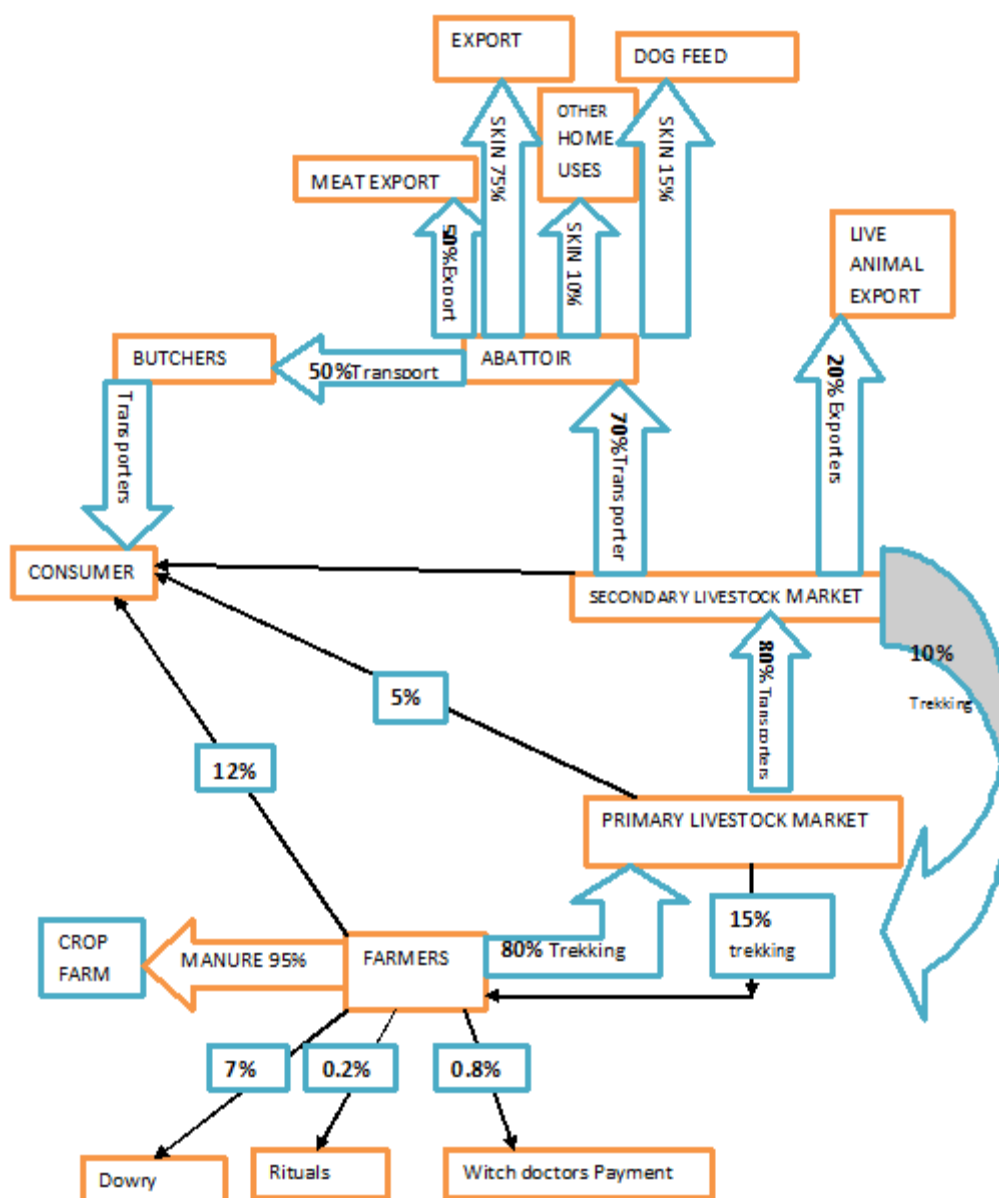


Figure 4 Small ruminants value chain in Tanzania

2.2 Current status and impacts of PPR

2.2.1 Current PPR-GCES Stage

Self-assessment was carried in 2015 and placed Tanzania in stage 2 in recognition of the PPR status based on surveillance, research and control activities carried out between 2008/2009 – 2015. However, a comprehensive stage assessment, involving the Regional Advisory Group, need to be carried out on existing regulatory and institutional capacities to respond to TADs including PPR and capacity to detect the disease.

2.2.2 PPR situation in the country and in neighbouring countries/region

The disease was first reported in northern Tanzania and confirmed in 2008 and officially reported to the World Organization for Animal Health (OIE) on 27th January 2009. By the end of 2010 the disease had further spread to eastern and southern parts of the country. So far the PPRV confirmed in Tanzania belongs to lineages II-IV. Lineage II has been described in northern and southern Tanzania, lineage III in northern and eastern Tanzania, and lineage IV in southern Tanzania. Lineage III is the lineage most commonly found in eastern Africa, whereas lineage II is most commonly found in western and central Africa.

In the recent past, there are indications of disease spreads and spill over to other regions that were considered to be free of the disease. Serological evidence of goats exposure to PPRV in Kigoma and sporadic outbreaks in Bahi (Dodoma), Misungwi (Mwanza), and Ngorongoro (Arusha) which were later on laboratory confirmed (SUA) are some of the evidence of further disease spread and persistency. Due to this widespread there is clear indication that the flock immunity is now low and the disease threatening 13.8 million small ruminants populations distributed in 15 regions of Tanzania mainland. At risk regions include Mara, Manyara, Arusha, Kagera, Mwanza, Shinyanga, Tanga, Tabora, Kilimanjaro, Dodoma, Mtwara, Ruvuma, Njombe, Mbeya and Rukwa.

The existence of disease in the neighbouring countries places Tanzania at a high risk due to constant movement of livestock and their products. In Kenya and Uganda PPR was recognized in 2007. There are no reports of PPR outbreaks in Rwanda and Burundi, although PPR is suspected to be present. The DRC reported problems with PPR in 2012, and it is now considered to have areas where PPR is present. Zambia has recently reported PPRV antibodies, but no clinical cases of PPR or presence of PPRV. There have been no reports of PPR outbreaks from Malawi and Mozambique, but targeted surveillance is ongoing.

2.2.3 Impact of PPR

The economic benefits of global eradication have been shown to be highly favourable (Jones *et al*, 2016). Healthy animals are crucial for a sustainable livestock production (Rushton *et al*, 2017). For cash-constrained smallholder farmers, death of a single sheep or goat could be devastating for the family livelihoods. Gender aspects might also be important in this regard, due to the fact that it is common for women to keep and/or be care-takers of sheep and goats. The recent socio-economic impact study of pastoral livelihood showed that sheep and goat are the only source of livelihood for up to 65% of the pastoralist (MALF, 2013). There is a very significant socio-economic justification for control and eventual elimination of PPR in the country since livestock production is an integral component of agriculture in the country which plays a big role in food security and poverty alleviation. Small ruminants in particular are usually an important source of food and income for poorer households and women. In pastoral communities where livestock is the major and familiar source of livelihood and an important component of coping mechanism, small ruminants are commonly the first step of rebuilding assets after environmental shocks like drought and disease. With a population of about 17.3 million small ruminants are not only important livelihood assets (cash and savings) in Tanzania but also a source of food security (milk and meat). Thus the main benefits of PPR control will be enhanced food security and livelihood assets.

The impact of PPR is felt at global, regional, national and local levels, affecting both trade and the local economy. Direct losses result from mortality, reduced productivity (milk and weight gain), and the costs of vaccination, antibiotics, veterinary services and disease surveillance. Indirect costs are mainly due to the sudden and rapid spread nature of the disease and include reduced fertility, losses due to quarantine and reduced small ruminants trade. This last aspect is particularly important at a regional/national/international level since the presence of PPR severely restricts stock trade whilst effectively closing the Middle East - export markets. Farmers also incur social costs, as small ruminants cannot be used for

functions. Therefore control and eventual eradication will provide by far great benefit to the livestock dependent communities, local, regional and national economy.

Study carried out in Tanzania using PE approaches (Swai *et al*, 2010) in pastoral communities indicated that cattle were the livestock species that made by far the greatest contribution to livelihoods. On average, cattle were considered to be about as important for livelihoods as both sheep and goats combined. For all livestock species, the main benefit derived from livestock was reported to be food, which included meat, milk, ghee and fat (32%). The second most important benefit was income from sales of surplus animals or produce (23%). Other lesser benefits include skins for sheep and socio-cultural roles (14%) for various reason, such as conflict resolution and payment of dowry with cattle or goats. Goats were often exchanged (16%) for cattle in the process of herd building; twelve goats or sheep can be exchanged for one heifer or a young bull. In some districts, hides for clothing (9%) and manure (6%) were also mentioned as an important livestock-derived benefit.

PPR has recently been identified as a target for global eradication by the international animal health community (OIE and FAO, 2015). Eradication is considered to be feasible because PPR virus has similar characteristics to the closely-related rinderpest virus that was the first livestock disease to be globally eradicated; transmission by direct contact; no environmental reservoir or vector; animals are infectious for a short period of time and do not become carriers; infection or vaccination stimulates life-long immunity; and effective vaccines and reliable diagnostic tests are available. The strategy will be launched in the year 2017 and expected to last for 13 years which is line with global eradication vision. Back to back implementation of this strategy, other control program for other small ruminant diseases will be taking place covering different targets and phases. Strategy implementation and performances will be guided by annual and Mid term progress and Review Plans.

2.3 Current capacity and activities to control PPR

2.3.1 Laboratory diagnostic system

The country laboratory diagnostic capacity refers to the range of methods and tests undertaken by veterinary laboratories. The diagnostic service range from antigen and antibody detection, virus nucleic acid recognition to virus isolation. The state of equipment and human resource and funding are indicated in the table below:

Table 1 Capacity profiles of Veterinary laboratories

S/N	Lab Capacity	State of Equipment	Human Resource/Staff	Modality of funding
A. Antigen detection:				
	Agar Gel Immuno-diffusion (AGID)	Good	Good	Government OIE twinning
	Immunocapture enzyme-linked immunosorbent assay (ICE ELISA)	Very good	Very good	Government Dev. Partners
	Haemagglutination Test (HA)	Very good	Very good	TVLA/Government
	FAT			TVLA/Government Dev. Partners
	Rapid tests			TVLA/Government
B. Virus nucleic acid recognition methods;				
	Conventional Reverse transcription PCR (RT-PCR) techniques	Very good	Very good	Government OIE twinning Dev. Partners
	Real-time RT-PCR	Very good	Very good	Government OIE twinning

				Dev. Partners
	ICE – ELISA	Very good	Very good	Government Dev. Partners
	LAMP Test	Very good	Good	TVLA/Government Dev. Partners
C. Antibody detection:				
	Competitive enzyme-linked immunosorbent assay (C-ELISA)	Very good	Very good	Government OIE twinning
	NPS ELISA	Very good	Very good	TVLA/Government
	3ABC-ELISA	Very good	Very good	TVLA/Government
	I-ELISA	Very good	Very good	
	Haemagglutination Inhibition (HI)	Very good	Very good	TVLA/Government
	Immunoblotting	Good	Good	TVLA/Government
	MRT	Very good	Very good	TVLA/Government
D. Virus isolation				
	Virus isolation in cell culture	Newly established	Good	Government OIE twinning
	Virus isolation in embryonated eggs	Very good	Very good	TVLA/Government
E.	Pathological Techniques			TVLA/Government
	Histopathology	Very good	Very good	TVLA/Government
	Haematoxylin and Eosin Staining	Very good	Very good	TVLA/Government
	<i>Post mortem examination</i>	Very good	Very good	TVLA/Government
	<i>Gross/clinical pathology</i>	Very good	Very good	TVLA/Government
F.	Parasitological Techniques	Very good	Very good	TVLA/Government
	Giemsa Staining Technique	Very good	Very good	TVLA/Government
	Magnetic Stirrer for detection of Trichinella larvae	Very good	Very good	TVLA/Government Dev. Partners
	Direct Smear : Thin smear Rapid test	Very good	Very good	TVLA/Government
	MacMaster Technique	Very good	Very good	TVLA/Government
	Wet smear and	Very good	Very good	TVLA/Government
	Buffy Coat Technique	Very good	Very good	TVLA/Government
	Test tube Flootation Technique	Very good	Very good	TVLA/Government
	Simple floatation technique	Very good	Very good	TVLA/Government
	Sedimentation Technique	Very good	Very good	TVLA/Government
	Tick identification Technique	Very good	Very good	TVLA/Government
G.	FUNGAL DETECTION			TVLA/Government
	Fungal detection -(SDA/LPCB)	Very good	Very good	TVLA/Government
H.	BACTERIAL CULTURE			TVLA/Government
	Bacterial culture identification and antibiotic sensitivity test	Very good	Very good	TVLA/Government
	Aerobic and anaerobic culture			
	ZN Stain	Very good	Very good	

2.3.2 Diagnostic tests currently used relevant to PPR and other priority small ruminant diseases

Diagnostic tests relevant to PPR and other SRDs undertaken at TVLA central laboratories, Centre for Infectious Disease and Biotechnology(CIDB) and TVLA satellite laboratories are shown in table 2

Table 2 Diagnostic services performed at Tanzania Veterinary Laboratory agency

S/N	Disease	Diagnostic Tests Performed in TVLA labs	Confirmatory test used for differential diagnosis
1.	PPR	C-ELISA, ICE-ELISA, PCR, AGID and Histopathology.	ICE –ELISA and PCR
2.	Brucellosis	C-ELISA, Rose Bengal test, PCR and CFT	C-ELISA and PCR
3.	RVF	ELISA, RT-PCR, qRT-PCR, and Histopathology	IgM capture ELISA and PCR
4.	Anthrax	Methylene blue staining and PCR	Direct polychrome methylene blue (M'Fadyean) – staining and qPCR
5.	CCPP	ELISA, CFT and PCR	
6.	Goat and sheep pox	AGID, ELISA, FAT, PCR and Histopathology	
7.	Rabies	FAT, dRIT and LAMP Test	FAT
8.	FMD	ELISA, PCR and FMDV-Ag Pen-side test.	Sandwich ELISA and PCR

2.3.3 Laboratory network within the country carrying out activities on PPR

TVLA network of laboratories and their capacity to perform PPR diagnostic activities are indicated in table 3.

Table 3: Tanzania Veterinary Laboratory network relevant to PPR diagnostic activities

SN	Lab	Molecular techniques	Serological techniques	Virological techniques	Pathological techniques
1.	Centre for Infectious Diseases and Biotechnology (CIDB)	Real Time and Conventional PCR	c-ELISA AGID	Virus isolation in cell culture ICE-ELISA Rapid antigen tests	N/A
2.	TVLA Centre-Arusha	-	c-ELISA	ICE-ELISA Rapid antigen tests	Clinical Pathology Post mortem
3	TVLA Centre-Dodoma	-	c-ELISA	Rapid antigen test	Clinical Pathology –Microscopy and Post mortem
4.	TVLA Centre-Iringa	-	c-ELISA	Rapid antigen test	Clinical Pathology –Microscopy and Post mortem
5.	TVLA Centre-Mwanza	Real Time PCR (qPCR)	ELISA	ICE-ELISA Rapid antigen test	Clinical Pathology –Microscopy and Post mortem Histopathology
6.	TVLA Centre-Mtwara	None	C-ELISA	Rapid antigen test	Clinical Pathology –Microscopy and Post mortem
7.	TVLA Centre-Tabora	None	C-ELISA	Rapid antigen test	Clinical Pathology –Microscopy and Post mortem
8.	Sokoine University of Agriculture College of Veterinary and	Conventional PCR and Real Time PCR (qPCR)	c-ELISA; AGID	ICE-ELISA Rapid antigen test	Clinical Pathology and Post mortem

	Medical Sciences (CVMS)	Sequencer for Sequencing and Characterization			
9.	TAWIRI Vet Lab	Conventional PCR	C-ELISA	Rapid antigen test	Clinical Pathology and Post mortem Histopathology

2.3.4 The laboratory diagnostic gaps TVLA is facing

1. Inadequate financial resources including fragmented funding
2. Difficult to clear non-conformance related to maintaining minimum reorder values of reagents and kits.
3. The inadequate/lack of funds pose a significant challenge to Quality Assurance Program (QAP) implementation efforts.
4. Low number of samples received and processed due to low awareness of farmers on use of animal laboratory diagnostic services.
5. High rate of staff exit owing to retirement age and scientists exodus;
6. Delayed delivery of kits, reagents and consumables due to bureaucratic procurement system especially those which are not available within the country.
7. Inadequate and yet dilapidated transport facilities
8. Inadequate laboratory consumables;
9. Shortage of equipments and reagents;
10. Worn out infrastructure which require frequent renovation
11. Frequent power cut-off and limited service of the standby generator;
12. Insufficient number of staff both researchers and supporting staff;
13. Inadequate fund allocation on research and development;
14. Delayed completion of CIDB BSL-3 laboratory.

2.3.5 Surveillance system

PPR passive and active surveillance in Tanzania is an on-going process. Surveillance is coordinated through 8 strategically located zonal veterinary investigation centre each serving a minimum of 5 administrative regions and 30 local government administrations (LGA's). The main source of information is from community/ producers and the dissemination is upward to LGA's, regions, zonal veterinary Investigation centre to National epidemiology Unit. Disease out break that warrant detailed active investigation is coordinated and undertaken jointly between District Veterinary Office (LGA's) and zonal veterinary investigation centre (ZVC).

The following minimum physical structures are available from grass root to national levels for surveillance operation: -

At farm/communal/village

Temporary crushes are built by livestock keepers whenever vaccinations are being conducted

- Primary livestock markets – Zoo sanitary Inspectors
- Watering points
- LDCs – Ward Veterinary Field officers
- dips – Dip attendants
- Slaughter slabs – Meat inspectors

At District level

- Diagnostic facility
- Veterinary centers/clinics/facilities
- Slaughter facilities

- Cold chain facilities
- Transport facilities
- Check points

At Zone level

- Diagnostic facilities
- Zoo sanitary check points
- Secondary livestock markets
- ICT – information networking
- Cold chain facilities
- Transport facilities
- Holding grounds

At National level

- Referral diagnostic facilities – TVLA - CIDB, TAWIRI, SUA
- Meat processing plants/Abattoirs
- Cold chain facilities

2.3.6 Control and prevention

Following PPR outbreak in Tanzania, emergency disease containment was supported by NGO – VetAid Tanzania through provision of vaccine and vaccination operations covering five districts that reported disease outbreak. Subsequently, the Ministry of Livestock Development and Fisheries got support for vaccination of PPR through Vaccination for Control of Neglected Animal Diseases in Africa (VACNADA) project. Vaccinations were undertaken in the regions and districts(LGA's) neighboring Kenya where the disease was reported first in Tanzania and this included districts in the northern zone (Kiteto, Simanjiro, Longido, Meru, Arusha, Monduli Ngorongoro and Siha Districts) and the lake zone (Tarime, Rorya, Bunda and Serengeti).VACNADA was implemented by the African Union-Interafrican Bureau for Animal Resources (AU-IBAR) in partnership with the Global Alliance for Livestock Veterinary Medicines (GALVmed), the African Union-Pan African Veterinary Vaccine Centre (AU-PANVAC) and the French Centre for International Cooperation in Agronomic Research for Development (CIRAD). However through SADC TADs project and local government initiative vaccination has continued into various villages in different districts depending on outbreaks. Other control measures that are commonly used during disease outbreak include heightening surveillance, both active and passive and imposing movement control bans.The later has been a challenge due to poor enforcement capacity and drought that mitigate movement of animals in search for water and pasture.

2.3.7 Legal framework

PPR is a notifiable disease according to OIE and AU/IBAR Animal Health Code for Terrestrial Animals (2007). There is an established legal framework within the country for the control of animal diseases covering key issues related to land ownership (including setting aside land for grazing), movement and transport of animals. However, weak enforcement of laws due to fragile institutional arrangements has caused significant shortfalls. List of laws/regulations that are in place for the time being and can be used in the control of PPR: -

- The Land Act No. 4 of 1999
- The Village Land Act No. 5 of 1999
- Food, Drugs and Cosmetic Act No. 1 of 2003
- The Veterinary Act No. 16 of 2003
- Animal Diseases Act No. 17 of 2003
- Animal Diseases Act (Animal Diseases Regulations 2007)
 - *Appointment and duties of Inspectors*
 - *Compensation*

- *Ante and Post-mortem Inspection*
- *Animals and animal products movement control*
- *Animal pesticides control*
- *Listing, notification and control of notifiable diseases and disposal measures.*
- Presidential Circular No. 1 of 2002
- The Local Government (District Authorities) Act No. 7 of 1982
- The Local Government (Finance) Act No. 8 1982
- The Meat Industry Act No. 10 of 2006
- The Dairy Industry Act No. 8 of 2004
- Animal Welfare Act A No. 19 of 2008 Revised 2010
- The Hides, Skins and Leather Trade Act No. 18 of 2008
- Central Veterinary Laboratory Act CAP 245 (R.E. 2009)
- National Livestock Research Institute Act No. 4 of 2012
- Livestock Registration, Identification and Traceability Act No. 12 of 2010
- The Grazing Land and Animal Feed Resources Act No. 13 of 2010

Additionally, enforcement of these laws and regulation are implemented by other actors such as police and the courts using their appropriate laws empowered by them. International guidelines provided by OIE, WTO, EU, SADC, EAC and AU/IBAR form a part of the legal framework that should be put into use judiciously.

2.3.8 Stakeholders involvement

Stakeholder is any individual, community, group or organization with an interest on the outcome from PPR control as a result of being affected positively or negatively or who may have influence on the implementation of the PPR control. The management of PPR requires strategic and tactical participation of the numerous and diverse stakeholders.

Table 4: List of stakeholders and their expected role and level of importance

S/no	Name of Institution/stakeholder	Roles/Responsibilities/ how are they engaged	Level of Importance/Influence	Benefit
1	Ministry of Finance	• Main source of funds • Formulation of Policy • Budgetary mainstreaming (Medium Term Expenditure Framework-Guidelines) • External support coordination	• Highly important and influential	• Increased revenue collection • Increased foreign currencies • Reduced importation of Goats and sheep meat
2	Ministry of Agriculture,Livestock and Fisheries (MALF)(DVS)	• Formulation of policies, strategies and Main Coordinator of implementation • Harmonize progress on local PPR control efforts with regional and international bodies. Budget approval and Source of funds • Regulation and enforcement of legislation(Import control, certification &inspection of facilities,products) • Disease monitoring, reporting and notification to public & OIE •	• Highly important and influential	• Increases food security and livelihood • Resources will be allocated to other disease control • Support resilient pastoralist livelihoods and sustainable agro and pastoralist production system
3	Ministry of Natural Resources and Tourism	• Coordination of wildlife activities • Source of funds	• Highly important and low influence	• Reduced potential spillover of the virus from livestock to wildlife
4	President's Office Planning Commission	• Planning guidance • Plan coordination	• Highly important and influential	• Increases food security and livelihood •
5	Prime Minister's Office - Regional Administration and Local Government (PMO – RALG)	• Disaster Management (operations and recovery stages)Coordination • Source of funds (Emergency Fund) • Workforce deployment	• Highly important and influential	• Increases food security and livelihood •
6	Ministry of Home Affairs	• Enforcement of laws ie quarantine and animal movement •	• Highly important and influential	• Smooth access to vaccine
7	Tanzania Food and Drugs Authority(TFDA)	• Registration of vaccine • Regulate importation of vaccine	• Highly important and low influence	• Quality veterinary input assurance
8	Central Veterinary Laboratory	• Rapid Response Team member	• Highly important and	• Health animals and capacity

		• Research on vaccine development • Vaccine production/Quality control • Diagnosis • Validation of vaccines • Training	influential	building
9	Tanzania National parks Authority (TANAPA) Tanzania Wildlife Research (TAWIRI) Ngorongoro Conservation Area Authority (NCAA)	• Research on PPR • Surveillance in wildlife/livestock interface areas • Source of funds	• Highly important and low influence	• No spillover of the virus from livestock to wildlife • Research findings
10	Zonal Veterinary Centres	• Surveillance and monitoring • Data collection, processing and reporting • Training • Vaccination	• Highly important	• Resource for PPR control will used to control other diseases
11	Nelson Mandela African Institute of Science and –Technology(NM-AIST)/Sokoine University of Agriculture	• Generate evidence based information ie : • Research on PPR • Vaccine development and validation • PPR diagnosis • Training	• Highly important and influential	• Research findings
12	Tanzania Meat Board	• Source of funds • Sensitization of stakeholders	• Highly important and influential	• Increases food security and livelihood •
13	Tanzania Dairy Board	• Source of funds • Sensitization of stakeholders	• Highly important and influential	• Increases food security and livelihood •
14	Local Government Authorities (Councils)	• Formulation of Rapid Response Teams • Source of funds • Supervise, regulate and enforce implementation of laws and by-laws • vaccination • Sensitization of stakeholders • Training of Livestock farmers	• Highly important and influential	• Increases food security and livelihood •
15	Private sector and Civil Societies	• Service provision (Sanitary mandates/ Vaccinations). • Procurement and distribution of inputs.	• Highly important and influential	• Increased business • Increased income

		• Source of funds • disease reporting • Sensitization of the stakeholders • Advocacy		
16	Primary Producers (Livestock farmers, Commercial farmers)	• Collaborating and implement PPR control measures • Breeding and rearing of animals • Sensitization of members. • Reporting disease to Veterinary Authority • Provision of health, welfare for animals	• Highly important and influential	• Increases food security and livelihood • Increase income
17	Livestock Traders (Local and Exporters), middle men and transporters	• Implement PPR control measures • Invest in PPR control infrastructures e.g. trucks, holding grounds, quarantine stations. • Source of funds • Buying and selling of animals • Reporting disease to DVS	• Highly important	• Increased business • Increased income
18	Development partners (Donors and international organizations)	• Source of funds • Technical backstopping • Support Capacity Building (Training, equipment and logistics • Co-ordinate international collaboration on PPR control	• Highly important and influential	•
19	Media(local & national radio station, newspapers and Tv?)	• Mass communication • Public awareness	• Highly important and influential	•
20	Veterinary Council of Tanzania	• Monitoring performance of professionals and para-professionals • Regulate veterinary training	• Highly important and influential	•
21	Tanzania Veterinary Association	• Promote veterinary profession • Pressure group • Advocacy	• Highly important and influential	•
22	Farmers organization, Community based organization	• Marketing of animals and products • Provision of inputs & credit to members • Advocacy for members	•	•
23	Consumers	• Feed-back to Veterinary Services	•	• Safe animal products

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2.3.9.1 Public Private Partnerships in animal health services delivery in general and PPR control services

Public Private Partnership (PPP) is been encouraged in livestock sector development. Currently and previously private sector has been working hand in hand with the government on control of PPR and other TADs. NGO like Vet Aid has worked with government for surveillance and vaccination against PPR in the northern zone in 2001. Vet Care LTD was contracted to vaccinate against PPR in northern and Lake Zone in 2003. Oxfam and Private Animal Health service providers (or Vet shops), have contributed significantly toward provision of vaccine in many remote pastoral communities of northern Tanzania. In addition to that, local government have been operating with private sector in various activities of disease control and prevention. Such relationship will be fostered and promoted during the implementation of this plan. The end desire is to facilitate accessibility of vaccine and timely services to livestock keepers.

2.3.9.2 Public awareness activities in place for the improvement of small ruminants' health and the control of PPR and other TADs

Public awareness activities for the improving small ruminants' health and control of PPR and other trans- boundary animal diseases have not been adequately publicized due to several factors including lack of resources. Building on previous disease outbreaks and the awareness materials that have been developed over time, public awareness as an activity will feature highly in the course of implementing this strategy. Several communication materials targeting key strategic areas and specific stakeholders groups/areas (live stock markets, schools, mosque, churches) will be developed and disseminated broadly to wide range of stakeholders along the small ruminant production value chain.

2.3.9.3 Weaknesses and gaps in stakeholders' involvement in the prevention and control of PPR and other SRDs

Despite of technological advancement on PPR diagnosis and vaccine development, there are several social and technical barrier impeding effective control of the disease amongst stakeholders. Some of the weakness and gaps are the following:

- Diagnosis of the mild forms of PPR that are the normal in endemic situations;
- Présence of other diseases presenting similar clinical signs
- The huge burden and knowledge gap on SRDs such as CCPP, SGP, Helminthiasis, Blue tongue, Nairobi sheep Disease and Brucellosis amongst others
- Low enforcement capacities to mount mass vaccination and regulate informal slaughter, animal movement due to severe shortage of staff and mobility facilities in some districts
- Resources (finance, logistical etc) to mount field surveillance and diagnosis has been erratic and inadequate;
- Weak infrastructure (roads, telecommunication) in remote areas
- Limited knowledge on the epidemiology of PPR including its transmissibility in different population settings and host species;
- Timely and accessibility of good vaccines has been a challenge partly due to inadequate and un-maintained cold chains
- Lack of rapid field diagnostic kits

2.3.9.4 Other small ruminant priority diseases (current status and prospects for control)

Combination of PPR control programmes with control measures for other diseases is advisable as it embraces the principles of the economy of scale and incentive for the small ruminant rearing communities. The diseases that will be combined with PPR control in Tanzania include CCPP, SGP, brucellosis, RVF, (based on Regional Animal Health network forum) or after participatory prioritization of SRDs in Tanzania. Ranking of the disease to be combined in the control programme will be based on various risk assessments conducted in different production systems and other factors including vaccine availability, prospect for combining vaccine and vaccine delivery system.

CHAPTER 3: ORGANISATION OF VETERINARY SERVICES

Prevention and control of PPR will be managed by MALF through mandated department of Veterinary Service in close cooperation with VS affiliated institutions, agencies, ZVCs, private and public animal health service providers and livestock keeping community. Sectors and institutions that contribute to the broader VS include:

➤ Public Health institutions:

a. Tanzania Food, Drug and Cosmetic Administration Authority (TFDA) for vaccine registration and certification

➤ Natural Resources and Tourism institutions:

a. Tanzania Wildlife Research Institute (TAWIRI)- for wildlife surveillance, research and diagnosis,

b. Tanzania National Parks – for wildlife surveillance

c. Ngorongoro Conservation Authority – for wildlife surveillance

➤ Agriculture institutions:

a. Tropical Pesticide Research Institute (TPRI) –for animal pesticide registration and certification

➤ Educational institutions:

a. Sokoine University of Agriculture (SUA): for research and training

b. Nelson Mandela – African Institute of Science and Bio-technology (NM –AIST) –for training

➤ Private Sector:

a. animal health service providers i.e. drug companies, animal feed compounders, milk processors, consultancy and training organisations

The key role and responsibility of VS include :

- Coordinating all epidemiological animal disease surveillance, early warning and data management activities
- Provide policy guidelines/brief/ framework at national level on issues relating to animal and veterinary public health, livestock census, diagnostics and investigation.
- Responsible for the facilitation of the development of vaccination policies for animal disease prevention.
- Responsible for facilitating the implementation of both qualitative and quantitative Animal diseases investigations
- Responsible for facilitation of the implementation of staff training programs in epidemiological disease surveillance, risk assessment, data management and disease control.
- Responsible for the facilitation of the preparation of animal and veterinary public health disease information, livestock census and investigation reports for dissemination locally as well as internationally to OIE, AU-IBAR, EAC and SADC Epidemiology Unit (Focal point unit: for disease notification to the above organisation)
- Responsible in close collaboration with other department (i.e. Policy and Development-DPP) for ensuring that disease information is effectively assessed and economic impact evaluated and advising on cost effective control measures.

- Responsible for facilitating the planning, developing and disseminating animal and livestock census messages
- Responsible for the coordination of the maintenance of all Zonal veterinary investigation centre and field based research
- Ensure that ZVC are properly equipped and appropriately manned by qualified staff
- Coordinating and participating in animal health surveillance networks within and beyond the country
- Formulate and enforce the legal and regulatory framework for the control of animal, pests and diseases
- Regulate the quality safety and standards of animal products and livestock feeds
- Ensure compliance with international standards and conventions

The role of Private sector will be recognizing (using disease recognition manuals) and reporting disease event at source. Additionally, private sector will be commissioned to undertake sanitary mandates i.e. vaccination and certification under guidance of CVO. Other activities will be sourcing PPR and other SRDs vaccine, farmer and community sensitization.

Several veterinary evaluation assessments have been conducted to address gaps in various core capacities and competencies as summarized in the Table below

Table 5: OIE PVS evaluation assesment conducted 2008-2016

Mission and purpose	Date when conducted	Level of confidentiality*	Comments (if any)
OIE PVS initial evaluation	2008	Not confidential –report is accessible to wide range of stakeholder	Report revealed broken chain of command, low funding and serious lack of veterinarian in the field and over reliance of para vets. On the positive side, the evaluation acknowledge the existence of vet school and reasonable working epidemiosurveillance and early warning system
OIE PVS Follow up evaluation	2016	Still confidential	Despite of large number of staff training, deployment (at national and subnational level) has not been to the level required. Underreporting is high because over 90% is based on clinical signs and state funding for core and sustained surveillance has been low, border control have weak points with gaps in infrastructures and funding disease control program has been low over years
PVS gap analysis	2009	Not confidential – report is accessible to wide range of stakeholder	Recommend strengthening competencies on use of veterinary laboratory diagnosis, epidemiosurveillance and information system
Veterinary Legislation Identification Mission	2014	Not confidential – report is accessible to wide range of stakeholder	Veterinary statutory body authority has greatly improved from 2008 to 2016, however statutory capacity showed no remarkable change since last evaluation(2008)
Other OIE capacity building activities (; laboratory mission; twinning programmes)	2013	Not confidential – the report is accessible to wide range of stakeholder	PVS Pathway Laboratory Mission report

Chapter 4: PPR STRATEGIC ERADICATION FRAMEWORK

The current strategy is aimed at detailing measures that will be implemented in a period of 13 years to control the disease. The PPR strategy developed is in line with the PPR-GCES, the Pan-African PPR Strategy and the SADC regional PPR strategy. Strategic interventions are aimed at ensuring that PPR is effectively controlled such that incidence of PPR and other SRDs is reduced significantly; the production and trade losses are minimized within the coming 13 years. PPR is a notifiable disease of major socio-economic importance in Tanzania (National Livestock Policy, 2006) and provisions for its control will be enforced in accordance with the provisions of the Animal Diseases Act, 2003 and other existing local by-laws.

4.1 PPR progressive control

For the purposes of PPR control a phased approach with successive steps from an endemic situation to eradication of the infection will be implemented. A harmonized tool for monitoring the implementation of PPR control strategies will be developed together with an accompanying assessment tool. The monitoring methodology will be in line with the one proposed for the Global PPR control strategy. The combination of PPR specific activities/outcomes and Veterinary Services critical competencies (according to the OIE PVS Evaluation tool) within the monitoring tool will be put into practice. Three distinct zones (infected, surveillance and disease free) will be identified with specific PPR activities and outcomes. Zoning will be done in accordance with the provisions of the Animal Diseases Act of 2003.

4.1.2 Infected zones

The infected zone refers to those geographical or epidemiological units with laboratory confirmed and or reported clinical PPR cases for which rapid response is very important to prevent PPR spread. The capacity for rapid response at National, Zonal, regional and Local Government Authorities (LGAs) level will be enhanced through technical training, acquisition of diagnostic equipment and establishment of infrastructures/facilities to contain the disease at source. Provisions shall be made for procurement of vaccines, vaccination equipment and support of vaccination campaigns and mobilization of Rapid Response Teams at Local Government Levels.

To reduce further spread of the disease, on-farm disease biosecurity measures and targeted vaccination of small ruminants will be carried out. Vaccination programmes will utilize vaccines manufactured according to the OIE Terrestrial Manual as well as certified by AU-PANVAC. For sometime Tanzania has been using PPR vaccine produced from the Nigeria 75/1 strain and this vaccine has been shown to be safe and effective. Vaccinated animals will be marked using affordable identification/marketing system such as ear notching to distinguish vaccinated animals from unvaccinated ones. The OIE guidelines recommend a 10-km radius around the disease foci(s) in areas where intensive livestock management is practiced, and a 50-km radius in areas where extensive husbandry is practiced. The essential activity in this zone is tracing and surveillance to determine source and extent of the infection.

Post vaccination monitoring will be carried out to estimate efficiency of vaccination.

In addition, epidemio-surveillance network will be strengthened to collate and analyze surveillance data to revise the risk maps and simultaneously guide interventions.

Awareness will be raised among all value chain actors to reduce risk of disease spread and encourage timely reporting of suspected disease events.

4.1.3 Surveillance zones (high risk zone)

These zones surround infected zones or may emerge after a considerable effort of implementing targeted vaccination and sanitary measures. Surveillance will be carried out focused on detection of incursions. To reduce further spread of the disease, targeted vaccination of small ruminants based on critical control points such as livestock markets and transport routes used by traders and semi pastoralists is recommended. In addition, awareness will be raised among all value chain actors to encourage timely reporting of suspected disease events.

4.1.4 PPR free zone (low risk zone)

Emphasis will be on strict animal movement control measures to prevent entry of disease from infected and surveillance zones aimed at demonstrating absence of the disease. In this zone there will be a prompt response mechanism such that disease is contained at the source once detected. Improved technologies for disease detection and control will be promoted. Some identified livestock and wildlife species may act as sentinel population. In this Stage a dossier may be prepared and submitted to OIE for country, zone or compartment recognition as PPR-free (without vaccination).

4.1.5 Capacity building

Capacity building will be implemented to ensure adequate availability of technical skills, facilities and equipment to diagnose and control PPR. The focus will be on provision of adequate communication, field and laboratory equipment and reagents as well as training of field and laboratory personnel. In addition, capacity building for farmers will seek to ensure adequate level of knowledge of PPR in the community to facilitate early detection and reporting of the disease. Capacity building is very critical for smooth implementation of Stages 1 and 2 of the PPR strategy to meet the critical competence required in terms of laboratory capabilities and raising of stakeholders awareness.

Twinning of laboratories with reference laboratories and Inter laboratory collaboration between veterinary diagnostic laboratories will be encouraged.

4.1.6 Technical training

4.1.6..1 Field staff

Diseases such as Blue tongue, Foot and Mouth Disease, Heart water, Orf, Pasturellosis, Pox and Contagious Caprine Pleuropneumonia may pose a challenge in the diagnosis of PPR because of similarities in the manifestation of the clinical signs. Field personnel will be trained to perform differential diagnosis and undertake surveillance for PPR and other small

ruminant diseases. Disease(s) recognition manual(s) and other standard operating procedures (SOPs) developed by Regional programs ie SMP-AH consistent to PPR and other PPR related diseases for ease of diagnosis and reporting disease outbreak will be developed and promoted widely.

4.1.6.2 Laboratory personnel

The effective control of PPR is dependent on timely and correct diagnosis of the disease. Actions will be taken to ensure that laboratory personnel have the necessary skills required for a timely and reliable diagnosis of not only PPR but also other diseases affecting small ruminants.

4.1.6.3 Farmers training and public awareness

Farmer training programmes will be developed to build the capacity on how PPR occurs; how it looks like, how it is best controlled as well as what to do when they suspect it. Farmer awareness programmes will be developed to inculcate ownership and support for disease control campaigns among livestock owners and other stakeholders. Information, Communication and Education (IEC) materials (Communication strategy) will be developed aimed at ensuring that stakeholders are aware of the nature and their role of reporting, potential consequences of PPR and other TADs, and the benefits of prevention, control and eradication. Potential attention will be given to females and youth, who are custodian of small stock.

4.1.6.4 Traders, transporters, brokers and abattoir worker training

Value chain actors namely agrovet shops owners, traders, transporters and butcherer training programme are critical and key component of PPR control. The aim of these trainings is to engage stakeholders to identify key factors important for improving sheep and goat health in smallholder settings/farms. Focus group interviews, questionnaires and discussions will be used. Communication dynamics between different actors will be observed.

4.1.6.5 Simulation exercises

Simulation exercises will be carried out to evaluate and update the strategy. PPR desktop and table top simulations are recommended given the high costs of carrying out field level simulation exercises. Field simulation experiences will be drawn from regional exercises.

4.1.6.6 Research

Research to develop pen side tests for PPR diagnosis, DIVA tests and genotyping of strains at molecular level will be highly encouraged. Epidemiological and Risk analyses will be carried out to define geographical areas and/or production systems at higher risk, to understand transmission dynamics, drivers of virus lineage and maintenance in various ecosystems. Other research areas include development of thermo-tolerant vaccines, the role of wildlife/livestock interface (potential spill over from domestic to wildlife) and other domesticated

animals (cattle, camels) in the transmission of disease and the identification of critical points and optimal methods for intervention. Value chain socio-economic studies will be conducted to generate information that will inform policy decision making at various level of governance.

4.1.7 PPR Eradication

4.1.7.1. Animal movement control

Enforcement of the animal and their products movement will be aimed at preventing entry and exit of disease at the same time maintaining disease freedom. Eradication phase will follow after discontinuation of vaccination that is after at most 5 years of risk based vaccination backed up with assessment of its effectiveness.

4.1.7.2 Surveillance

Combination of surveillance approaches(passive, active, risk based, real time -mobile) will be employed to support the PPR control and eradication efforts. Participatory epidemiology (PE) has been suggested as a particularly suitable research method when studying epidemiology and social impacts of diseases such as PPR. Protocols for both types of surveillance will be developed which among other things will give guidelines on sampling procedures.

4.1.8 Cross cutting issues

4.1.8.1 Communication

A communication strategy will be developed to address issues pertaining to PPR control that are amenable to resolution through communication. Communication will be aimed at increasing the level of awareness and knowledge on PPR as well as addressing attitude and practices that facilitate the persistence and spread of PPR in the country. Communication will also seek to ensure that stakeholders are aware of their role and responsibility in disease reporting as well as the potential consequences of PPR and other TADs, and the benefits of prevention, control and eradication. Communication of information on PPR will be channeled through a variety of methods including but not limited to workshops, electronic and print media.

4.1.8.2 Information and knowledge management

Epidemiology unit will be strengthened for data collection, collation, storage and analysis for timely reporting of PPR status. To ensure standardization and consistency of data management, Livestock Information Management System (LIMS) and continental ARIS will be used and reports shared with interested parties.

Guiding Principles

4.1.6.11 Risk based approach

The disease control activities to be implemented in any given area will be determined by the risk profile of the geographical location/ or production system. Other factors to be taken into account include vastness of the country and on assumption that risk factor for the disease is not uniformly distributed. Approach and interventions to control the disease will be risk based to ensure focused and effective measures in place, three risk zones (infected, high (surveillance) and low risk zones) are identified. To this effect, capacity on risk analysis techniques will be built so that the available resources can be used more strategically by concentrating on critical points of the disease incursion, dissemination and transmission cycle to make sure those chances of success and impact are maximized. In addition to determining the major risk factors for PPR the risk analysis will provide an estimate for:

- The chances of risk of introduction / entry of the disease
- The likely mechanisms and portals of PPR exposure / transmission
- The potential impact of the consequences should the disease enter

4.1.6.12 Cross border

Peste des Petits Ruminants (PPR) is a notifiable and a trans boundary animal disease that has the potential for rapid spread and serious socio-economic impacts.

Ethnic groups that live on these sides of the borders maintain cross-border social ties which commonly involve exchange of livestock. There are traditional livestock movements aiming at exploiting temporal and spatial distribution of range resources within the ecosystem along the borders. Other practices include Illegal movement of livestock in search of pasture and water, animal health services as well as a result of cattle rustling and civil strife. Moreover, Tanzania and some of the border countries have rich wildlife resources creating to and off seasonal migration of animals. These wildlife also play a significant role in the epidemiology of some of the TADs in the area. Strengthening of border and import controls and reinforcing Quarantine/ holding ground will be used as a first line of defense against the disease spread. Previous best practice on RP eradication that involved liaison and establishing linkages with neighboring countries will be adopted and promoted. Activities to be given priorities includes developing and strengthening existing cross-border MoUs, initiating and hosting of regular cross-border meetings, joint, coordinate and harmonized surveillance, joint simulation exercises, sharing disease intelligences and disease control plans.

4.1.6.13 Control of other national priority SRDs

Common small ruminant diseases in Tanzania include Bacterial diseases which are CCPP, Brucellosis, Dermatophilosis, Anthrax, Tetanus and Salmonellosis. Viral diseases include PPR, Orf, Goat & Sheep pox, Blue tongue, RVF and FMD. Furthermore there are Protozoa and parasitic diseases which include Coccidiosis, Mange, Liver fluke, Fleece, Lice and ticks. Clinical PPR resemble other diseases like CCPP and most of the time PPR is misdiagnosed as CCPP, Orf, Sheep & Goat pox. Therefore control of other diseases will scale up the effort as well will help to avoid mis-diagnosis of PPR disease. Moreover field personnel training, capacity building in laboratory equipment, personnel and intensification of active and passive

surveillance will improve surveillance of PPR and other diseases. Improvement of bio-security and zoosanitary services also will enhance early detection in case of outbreak of diseases.

4.1.6.14 Self-Sustaining Mechanisms for Animal Health Services Delivery

Several key elements of this strategy are in place to ensure that the surveillance, research, supplies and vaccination activities methods and plans will be integrated and sustained by Tanzania government and supporting partners.

- Regular meetings and engagement workshops involving all stakeholders, public and private will be held throughout the formulation and implementation of the strategy, fostering strong in-country and transboundary partnerships, and ensuring ongoing planning to facilitate a smooth transition of ownership of the activities and network to be established in the course of strategy implementation to the Tanzania and supporting partners.
- Trained field personnel will remain at their duty station after the end of the post eradication phase.
- Community members, traders, transporters, butchers, will have improved skills to recognize PPR-like signs and other diseases thereby increasing their capacity to fulfil their essential roles in field surveillance.
- Developments made at local institution laboratories in terms of training and diagnostic infrastructure will help establish them as a PPR diagnostic centre of expertise. These advances will be of long-term benefit (1) to support veterinary services, (2) to provide training opportunities for Tanzanians, and (3) to support national and international research groups.
- The strategy will equip scientists with expertise in participatory surveillance of PPR and other animal diseases. The training envisaged as part of this strategy will allow them to tackle emerging and endemic transboundary animal diseases in the long term.
- Public and Private sector involvement from vaccine, drugs procurement, distribution and sanitary mandates will compliment animal health service delivery in the long run.

4.1.6.15 Adaptive Management

Strategic interventions are aimed at ensuring that PPR is effectively controlled such that incidence of PPR and other SRDs are reduced significantly; the production and trade losses are minimized within the coming 13 years. Rapid response is very important if PPR spread is to be prevented. The capacity for rapid response at National, Zonal, regional and Local Government Authorities (LGAs) level will be enhanced through technical training, acquisition of diagnostic equipments and establishment of facilities to contain the disease at source. Efforts will be made to regulate livestock movement to control spread of the disease. Provisions shall be made for procurement of vaccines, vaccination equipment and support of vaccination campaigns and mobilization of Rapid Response Teams at Local Government Levels.

PPR control should not be taken as a ‘stand-alone activity’ but rather as a pathway into strengthening the Veterinary Services (VS) in a sustainable manner. This in turn will create better possibilities to control other priority diseases and pursue sensible and cost-effective

combinations and synergism of activities. The activities to strengthen VS are not PPR-specific and therefore are expected to have spill-over effects on the control of all major TADs.

4.1.6.16 Partnerships

Managing PPR require efforts, collaboration and coordination of several stakeholders. Apart from primary stakeholders (Table 4), strategic stakeholders that should play a significant role in terms of resource mobilization and advocacy are prudent during the implementation of this plan. Partnership and the proposed roles are shown in table 6.

Table 6: Partnership and their role/responsibility

National/Government sectors	Roles and responsibilities
President's Office, Regional Administration and Local Government (PORALG)	PORALG provide support in directing and controlling preparedness and response operations in the event of an disease incursion, communication and warnings, field surveillance, vaccination , public information, resources and supplies required for disease control
Ministry of Finance and Planning	Ministry of Finance and Planning has a primary role in resources and supply. Collaborate in reaching the financial institutions to involve them in resource mobilization and information dissemination
Ministry of Agriculture, Livestock and Fisheries	Provide policy direction, mobilise resources in liaison with other Ministries/institutions, facilitate PPR control and prevention including surveillance and diagnosis to support control efforts
Ministry of Natural Resources and Tourism	Facilitate diseases surveillance ,control and prevention at interface including research, diagnosis and surveillance to support disease monitoring systems
Ministry of Foreign Affairs and International Cooperation	Collaborate in dissemination of information to other countries through embassies and regional organizations
Institutions and Agencies- (SUA, SACIDs, TVLA, TAWIRI, TFDA and other Research Institutions)	Collaborate with respective sectors in the implementation of the plan in respective areas(ie research, training, vaccine procurement and vaccination)
Partnership with regional and sub-regional projects, donors, NGOs , CBO's	Collaborate in resource mobilization, support communication and information dissemination and vaccine procurement
Partnership with International organisations (AU-IBAR, FAO, OIE, RECS i.e. IGAD and EAC, IAEA, NGOs)	Support and technical and financial back stopping the implementation of the strategy

4.2 Results Framework

Control and Eradication Plan

Guiding Principles

The following principles will guide the implementation of this plan:

- Prevention, control and eradication of PPR and SRDs is a national public good and requires strong political and financial commitment at national and LGA's levels.
- Sustainable utilization of existing supportive institutions and whenever possible drawing on lessons learnt
- Use of a PPP approach to realize technical, political, and regulatory frameworks required to effectively manage PPR and SRDs
- Science-based and continually adjust to new information and technologies

Core values

The following are the core values that will guide the implementation of this control plan:

- **Country Ownership and leadership**, with the government coordinating and ensuring that all interventions by stakeholders are in line with relevant national guidelines;
- **Community participation**, with the involvement of communities, civil society (FBOs, CBO's) and the private sector;
- **Equity in access to services**, focusing on highly vulnerable and resilient population groups, and under-served areas;
- **Strengthening partnerships** across all partners, the private sector, research and academic institutions;
- **Fostering inter-sectoral and cross-border collaboration** at local; district, zonal and regional level between livestock and wildlife sector to reinforce timely information sharing and coordinated interventions.
- **Shared responsibility**: Global PPR eradication is a shared responsibility that cannot be achieved by a single country or sector. Its success depends upon collaboration among animal health and wildlife sectors and neighbouring countries.
- **Transparency**: openness and willingness to promote and share information to facilitate rapid response
- **Resilience** - recognising the varied players ie. Producers, traders, brokers, slaughters, private sector, animal health officers with the ultimate aim of reaching a common goal
- **Dynamism**- This plan will be receptive to new problem that can emerge, situations, and changes in law policy and institutions. Therefore, the plan will be reviewed and updated periodically in order to accommodate changes to make the Plan viable

Vision, Mission and Goals

Vision

A resilient nation able to promptly detect, prevent and effectively respond geared toward eradication of PPR and other small ruminants health threats in order to protect animal health and mitigate against negative impacts on the economy.

Mission

A nation that has attained and sustained all the minimum OIE core capacities and competencies.

Goal

To eradicate PPR and other SRDs in order to create wealth and economic growth of livestock and livestock products dependent communities and Tanzania at large.

4.2.1 Overall Objective

The overall objective is to reduce morbidity, mortality and socio-economic impact due to PPR and SRDs threats and contribute to MDG no. 1 (to food security, poverty alleviation and resilience of livestock-dependent communities in Tanzania).

4.2.2 Specific objectives

The specific objectives include:

- Effective control and eventual eradication of PPR disease
- Reduce the impact of other Small Ruminant Diseases (SRDs)
- To align all activities with the “global approach” and a broader animal health system strengthening with whole of veterinary service approach.
- To strengthen and sustain the national capacity to promptly respond to and recover from the negative effects of outbreaks and other animal health emergencies

4.2.3 Expected outputs and activities

The expected outputs :

- PPR eradicated from the country
- Other SRDs controlled
- Veterinary services strengthened

4.2.4 Coordination, Management, and partnerships

The success of the National PPR eradication programme requires the establishment of functional coordination and networking mechanisms at national, regional and global levels. At national level, a PPR national coordinator and advisory committee will be established to oversee the implementation of the plan, advice, mobilise resources and serve as a forum for information sharing, planning, and reporting on progress made and challenges encountered. The national coordinator will be responsible for coordinating all PPR activities and serve as liaison person to the regional and continental group. Additional role of national coordinator is to link PPR control stakeholders such as affiliated institutions, civil society, researchers, vaccine manufacturers and distributors and participate in the Regional PPR coordination meetings and updating stakeholders on disease status. Other bodies to work with include the

4.3 Progressive Control Pathway

The framework for PPR control will be based on the global progressive step wise control programme that has been endorsed and adapted at continental and regional levels. The key components and activities along the pathways and at each stage will be identifying risk and formulate mitigation measures in order to reduce the disease impacts. The global proposed phases are: Phase 1 : Preparation phase 1 (3 yrs) ; Eradication phase 2(5 yrs) ; Accreditation phase 3(3yrs) and Post-eradication phase 4(4years). Building on self country assesment report, Tanzania fall under eradication phase.

Phase 2: Eradication phase

The objective is to reduce the incidence of PPR in endemic foci and prevent further spread into free areas based on PPR generated data over years and disease risk maps. Achieving this objective will be through conducting the following activities :

- In the free areas, the main focus will be to prevent incursions and maintain freedom from PPR through sanitary measures and surveillance. These will include strenthening the following :
 - Structured surveillance system (syndromic, participatory and passive surveillance) and early detection
 - Movement controls (movement restriction and quarantine)
 - Awareness creation to various level of stakeholders
 - Outbreak response and tracing
- Enhance and support the participation of producers, traders and other stakeholders along the value chain including researchers and wildlife
 - Support joint participatory planning and control programmes (requires operational funds and;
 - awareness creation on all aspects of PPR control
- Depending on the epidemiological situation and other risk profiles, conduct and implement targeted vaccination in high risk geographical zones/ areas. Requirements include vaccines, operational funds.
 - Promote and faciliatate field validation and use of technologies for disease detection, reporting and control (including rapid pen-side diagnostic tests, quality assured thermostable PPR vaccines and the combination of PPR control interventions with interventions for other priority diseases of small ruminants).
- Promote and faciclitate animal health service delivery through engagement of private sector in vaccine and drugs procurement, distribution and vaccination under private-public partnership.
- Develop and implement effective communication strategy to assure stakeholder participation

- Update disease risk maps and revise target and intervention where appropriate
- Strengthen capacity building at all levels (testing preparedness and response plan, training, vehicles facilities, cold chain and utilities)
- Conduct Post vaccination sero-monitoring to assess the effectiveness of the vaccinations. Requires operational funds, field and laboratory materials (Communication materials, sampling equipment and laboratory kits). Parallel activities to be undertaken include :
 - Surveillance (Active, syndromic and passive surveillance)
 - Movement controls (movement restriction and quarantine)
 - Awareness creation

Phase 3: Accreditation phase

The objective of this phase will be to verify eradication of PPR and eventual seeking for OIE accreditation of freedom. Activities include:

- Structured surveillance activities (random surveys for proof of absence of PPR).
- review of emergency preparedness and contingency planning.
- review of the impact of control measures (vaccination, bio-security).
- Strengthen awareness campaigns targeting value chain actors (animal health, wildlife, NGOs, CBOs, FBOs, media, traders, meat processors)
- Application for endorsement of National PPR control programme by the OIE

Phase 4: Post eradication phase

The objective of this phase will be to consolidate best practices and document lesson learnt, challenges and continuous monitoring of disease incursion. Activities will include:

- Undertake period sero monitoring of virus activities
- Strengthen awareness campaigns targeting value chain actors (animal health, wildlife, NGOs, CBOs, FBOs, media, traders, meat processors)
- Take inventory of virus containing materials and prepare plan for disposal
- Continue monitoring disease through passive, syndromic and participatory surveillance
- Evaluate socio-economic impact of PPR and other small ruminant diseases
- Document good disease management practice and upscale for control of other diseases

CHAPTER 5: Monitoring and Evaluation

The objective of M&E is to build a harmonised and coordinated framework for supervision, monitoring and evaluation in order to generate data for decision making, programme development, resource allocation and management at all levels and among all stakeholders.

Progress towards the attainment of the targets set out in this national strategy plan will be evaluated quarterly, annually, at midterm and end term covering all projected phases. Data will be collected through periodic progress reports, annual reviews/assessments and reporting, after action reviews, exercises and joint external evaluations and other relevant assessments like the PMAT, as well as periodic supervision. Building sustainable capacity at all levels-national, local governments, the private sector and communities to carry out supervision, monitoring and evaluation of key strategy result area is important. For some technical areas, there will be a need to reconceptualise and re-organise the managerial and support mechanisms and structures at national, subnational and local levels, including defining a clear supervisory mechanism, roles of the various decentralized levels and the community.

Moreover there will be a need to increase the training, recruitment and deployment of the required human resources at all levels. In addition, it will be critical to ensure the utilization and dissemination of information to all stakeholders for purposes of improving management, sharing experiences, upholding transparency and accountability

Strategies

(a) Advisory committee

Based on suggestion made during Regional meetings and endorsed by CVOs, country plan will be externally monitored by Regional Advisory Group (RAG) and Regional Control Coordination Committee of PPR and other small ruminant diseases (PPR/SRDs-CCC) to be established. The terms of reference for the two committees will be as follows:

(i) RAG:

- To review self and external assessment of the PPR stages at the roadmap meeting to be conducted from time to time
- To guide PPR training and capacity development activities to support regional and national strategies
- To provide advice on the status of PPR assessments including the analysis of Critical Competences
- To support technical review and implementation of the national strategic plan
- To advise on issues or factors preventing effective progress of the PPR roadmap
- To support countries in the preparation of applications to OIE for endorsement of their national control strategy and their dossier for official country freedom recognition

(ii) Regional Control Coordination Committee of PPR and other small ruminant diseases (PPR/SRDs-CCC)

- To create understanding on the existing status and national and regional activities on PPR CCC and other SRD

- To verify gaps and challenges in the control of PPR and other SRD
- Review and endorse the regional framework and national strategies for progressive control of PPR and other Small Ruminant Diseases and other relevant recommendations
- Ensure harmonization of PPR/SRDs control programmes in the region
- To coordinate and exchange information on good practices and lessons to avoid duplication of efforts and improve complementarities on the control of PPR and other SRDs in the region;
- Undertake the role of advocacy for buy-in and timely actions of the control and eradication programs

(b)Annual assessments and reporting

The main purpose of completing the (PMAT) Monitoring tool questionnaire will be to fulfil the obligation of Member States and the PPR global eradication Secretariat to report annually to the World Animal Health Assembly and FAO summit on the implementation of national strategy.

(c) After Action Reviews

It is imperative to complement the annual reporting tool by reviewing a real-life experience of a PPR event, which can offer an opportunity to learn lessons and identify opportunities for improvement that were not recognised through the annual reporting tool regarding the functionality of the core key result area. This plan will support after action review using the methodology proposed by other organisation i.e. FAO

(d) Other assessments

Additionally, other animal assessments will also be used to assess the implementation of the plan and this include;

- Performance for Veterinary Services reports(Oie Gap, Follow up, Laboratory and Legal)
- Livestock sector analysis
- Baseline Analysis Report(BAR); Improving human and animal disease surveillance

Periodic supervision

Periodic supervision and routine monitoring will be done to ensure the activities are implemented according to target based on PMAT tools. These activities will be integrated in to the routine quarterly supervision schedules within respective sectors(Livestock and Wildlife). The supervision will be carried at all levels; starting from the National level i.e. Ministry supervising staff at regional levels including staff at Local Government Authorities; and Local Government Authorities staff supervising those working beneath them.

CHAPTER 6 : Estimated budget

Table 7 Estimated budget for Five years of implementation

Items	Quantity		Budget IN TSHS					
		Unit cost	YEAR 1 (000')	YEAR 2 (000')	YEAR 3 (000')	YEAR 4 (000')	YEAR 5 (000')	Total budget (000')
1. Epidemiology and surveillance								
Equipment								
Train 40 personel for Surveillance			200,000.00					200,000.00
Carry out surveillance in 185 districts			250,000.00	250,000.00	270,000.00	290,000.00	300,000.00	1,360,000.00
Train 50 staff on risk analysis			50,000.00					50,000.00
Vacutainer tube	10,000,000	250	1,250.00	1,250.00				2,500.00
Needle	10,000,000	20	100,000.00	100,000.00				200,000.00
Cryovials	10,000,000	100	500,000.00	500,000.00				1,000,000.00

Swabs	5,000,000	200	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00	1,000,000.00
Needle holders	1,000	50	50,000.00					50,000.00
Camera with GPS	10	500000	5,000,000.00					5,000,000.00
Car Fridges	20	500,000	10,000.00					10,000.00
Cool boxes	1,500	150000	225,000.00					225,000.00
Viral Transport media	50,000	3000	30.00	30.00	30.00	30.00	30.00	150,000.00
Sampling bottles	50,000	3000	30.00	30.00	30.00	30.00	30.00	150,000.00
Permanent markers	18,500	3000	11,100.00	1,110.00	11,100.00	11,100.00	11,100.00	55,500.00
Sampling bags	50,000	100	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	5,000.00
Note books	5,000	2000	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	10,000.00
Writing pad/Pens	5,000	2000	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	10,000.00
Transport								

Etc.								
2. Vaccination								
Carry out Vaccination campaign			293,548.00	312,903.00	334,194.00	357,613.00	383,374.00	1,681,632.00
Procure Vaccines	4300000	250	2,500,000.00	2,550,000.00	2,600,000.00	2,650,000.00	2,700,000.00	13,000,000.00
Vaccination equipments								
Automatic Syringes @ district 20	3700	50000	185,000.00					185,000.00
Needle 30PKt @ District	5550	15000	83,250.00	83,250.00	83,250.00	83,250.00	83,250.00	416,250.00
Freedge for 185 districts	185	1000000	185,000.00					185,000.00
Protective gears	2775	150000	416,550.00					416,550.00
Sterilization stove 5 @ district	925	100000	92,500.00					92,500.00
3. Laboratory								
Procure Diagnostic kits			40,000.00	43,000.00	46,300.00	49,930.00	53,923.00	233,153.00
Train 40 laboratory personel			4,548.00	4,903.00	5,294.00	5,723.00	6,195.00	26,663.00

Transfer and sample storage			1,200.00	1,500.00	2,000.00	2,300.00	2,500.00	9,500.00
Procure lab Equipments			50,000.00	55,000.00	63,000.00	66,000.00	70,000.00	304,000.00
4. Communication								
Airtime/ Internet services			2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	10,000.00
Laptops/lpad	200	1500000	3,000,000.00					3,000,000.00
5. Training/studies								
Field officers refresher course on PDs			100,000.00	110,000.00	120,000.00	130,000.00	140,000.00	600,000.00
Support adaptive research			200,000.00	210,000.00	221,000.00	23,310.00	246,410.00	900,720.00
6. Coordination and Management								
Stakeholders/consultative meetings			60,000.00	70,000.00	80,000.00	85,000.00	90,000.00	385,000.00
Simulation exercise 200 personel			160,000.00			200,000.00		360,000.00
Monitoring and evaluation			60,000.00	66,000.00	69,000.00	75,000.00	80,000.00	350,000.00

Purchase of 10 vehicles	10	100000000	1,000,000.00					1,000,000.00
Fuel and maintenance			100,000.00	100,000.00	100,000.00	100,000.00	100,000.00	500,000.00
7. Personnel								
Political leaders Sensitization			20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	100,000.00
Sub total								33,233,968.00
8. Contingency								
10% Proposed Budget								3,323,396.80
TOTAL								36,557,364.80

Chapter 7: Resource mobilization

Control of PPR is a public good that requires considerable government investments in terms of both human and physical resources. Apart from resources, mainstreaming PPR control in the government budget lines will be explored to sustain the control activities. Apart from government funding, private sectors mainly animal health service providers will be motivated and encouraged to participate in the control activities. Other players envisaged include research institutions and donor partners. Researchers are expected to undertake and support adaptive research and donors are expected to provide financial and technical backstopping.

The ongoing PPR related projects which are being coordinated through Sokoine University of Agriculture and University of Zambia include:

- PPR epidemiology and infectious biology (2013-6402 & 2014-4293), and transboundary infectious diseases in sheep and goats (2016-05667), funded by Swedish Research Council (SRC).
- African integrated ecological research for peste des petits ruminants elimination – a model for complex ecosystems. Greater Serengeti ecosystem: southern Kenya (Narok and Kajiado Counties), northern Tanzania (Ngorongoro, Karatu, Monduli and Longido Districts, Arusha Region; Serengeti District, Mara Region, and Meatu District, Simiyu Region). This collaborative research initiative between wildlife department and livestock department along the Tanzania/ Kenya border is testing the hypothesis that the elimination of peste des petits ruminants (PPR) virus infection from domestic small ruminants leads to the elimination of PPR virus infection from in-contact wildlife populations. This research is funded by UK -Department for International Development (DFID) through Biotechnology and Biological Sciences Research Council (BBSRC) to be launched in September 2017.

Actions that will be taken to mobilize resources include developing success disease control case studies, lobbying and demonstration of the economics of disease control intervention to policy makers and other potential donors.

CHAPTER 8: ANNEXES

Annex 1: Logical Framework: M&E

National Strategy description	Objectively verifiable indicators of achievement	Source and means of verification	Assumptions ¹
Goal			
To contribute to food security, wealth creation, trade enhancement, nutrition, poverty alleviation and resilience of livestock-dependent communities	Improved sales for local and export market of small ruminants and products.	• Livestock markets records • export records • abattoir ante-mortem and meat inspection records.	Lucrative market of small ruminants
Purpose			
Eradication of PPR, reduction of other SRDs incidence and OIE accreditation of freedom from the disease achieved	PPR incidences cleared and other SRDs incidences in districts minimized significantly.	Weekly, Monthly, quarter and annual animal health reports, Dossier	Funding, human resource-timely available
Key Results Areas			
R1: PPR and SRD Controlled			
1.1 Pre-vaccination sero-monitoring			
1.1.1 Field surveys and samples analysis	8 surveys	Reports	Funding
1.1.2 Purchase of field survey equipment/ reagents	surveillance kits purchase	Delivery notes	Funding
1.2. Management of PPR, CCPP, sheep and goat pox, through vaccinations and appropriate treatments.			
1.2.1 Purchase of vaccines, and equipment,	18 million doses of PPR, SGP CCPP, each Equipment	Delivery notes	Availability of funds and vaccines

¹Countries are expected to provide information that may affect the implementation of the planned activities by responding to the listed questions

	Other inputs		
1.2.2. Carry out vaccination and treatments	Carry out two vaccination programme for each disease 80% of targeted animals vaccinated	Reports Vaccination records	Funding and farmer participation and compliance
1.3 Capacity building of laboratory diagnostics			
1.3.1. Procurement of laboratory equipment, test kits, shipping materials, and other laboratory consumables	8 Laboratories equipped	Delivery notes report	Funding availability
1.3.2. Training and workshops	6 local training workshops conducted 6 regional network meetings attended	Reports	Funding availability
1.3.3. Refurbishment of laboratories	8 laboratories biosafety and biosecurity enhanced	Completion certificates	Funding
1.4.4. Sample processing and analysis	90 % of submitted samples processed and analyzed and feedback given.	Reports	Funding and timely availability of laboratory consumables
1.3.5. Shipping of samples to the local reference laboratories	90 % of eligible samples referred	Reports and shipping documents	Funding
1.4 Develop an effective communication strategy to assure stakeholder participation			
1. 4.1. Prepare message for producers, extension workers, policy makers, media and community	6 messages produced	Reports	Funding availability , social cultural barriers
1.4.2. Print and distribute messages for the different stakeholders	200,000 Pamphlets printed 200,000 brochures printed	Dispatch/delivery notes	funding
1.4.3 Hire Local radio for dissemination of messages in local FM stations	10,000 radio spots	Contracts with the radio stations CD reports and feedback reports	Funding availability of radio stations
1.4.4 Print messages in local print media	50 print messages	Print media copies	Funding
1.4.5 Conduct dissemination community with local leaders	5000 public/community meetings	Reports	Funding

1.4.6 Formation of community disease reporting committees	500 operationalized committees	Reports	Funding and community commitment
1.4.7 Conduct coordination and feedback workshops for partners	52 workshops conducted	Reports	Funding
1.5 Development and activation of preparedness and contingency plans for PPR free areas	One preparedness and contingency plan developed and activated	CP plan Simulation report	Funding
1.6 Post vaccination sero-monitoring to assess the effectiveness of the vaccinations			
1.6.1 Field surveys and lab analysis	8 surveys	Reports	Funding
1.7 Prevent incursions and maintain freedom in the free areas, through sanitary measures and surveillance			
1.7.1. Passive Surveillance	• 50 Disease reports at LGA'S and national levels each • 10 Quarterly sanitary reports • 10 Livestock disease Data bases at the Zonal's and national levels established	Reports Operational data base	Funding
1.7.2 Undertake syndromic surveillance through farm visits, watering points, Market point stock route inspection	52 weekly inspections conducted per LGA's	Reports	Funding
1.7.3 Awareness creation and enhancing stakeholder participation in joint programmes, communication through meetings, Workshops Seminars field days (cf with communication)	• 250 field days • 150 workshops and meetings conducted	Reports	Funding
1.8 Improve animal health service delivery systems and make use of improved technologies for disease detection and control			
1.8.1 Enhance preparedness and rapid response capacities	30 rapid response teams in place 30 Rapid response preparedness plans	Preparedness and response plans Records of simulation exercises	Funding
1.8..2 Improve information flow along the value chain	100% of notifiable diseases encountered by LGA'S reported in a timely manner 100% laboratory feedback on received	reports	Funding, disease awareness and appropriate infrastructure in place

	samples conducted Quarterly national feedback reports produced and disseminated		
1.8..3 Support applied research	DIVA/Thermotolerant/field pen -side kits research supported Role of wildlife in epidemiology of PPR research supported Research in Circulating lineage supported Socio-economic impact of control intervention supported Research in real time surveillance tools supported	Reports	Funding and availability of appropriate technical staff.
1.9 Revise the risk maps and the target of control interventions, focusing on eradication.			
1.9.1 Data analysis and generation of risk maps to facilitate review of Contingency Plan	Revised risk maps available	Maps	Funding and appropriate skills on mapping
1.10 Review of preparedness and contingency plans			
1.10.1 Review and update the Contingency Plan	Revised preparedness and contingency plans	Plans	Funding
1.10.2. Simulation of emergency preparedness and response	2 National field simulations 8 zonal field simulations 47 Table top LGA'S simulations	Reports	Funding
R2. PPR Eradicated			
2.1 Enhancing disease surveillance and early detection			
2.1.1Passive surveillance	50 Disease reports at the LGA and national levels each	Reports Operational data base	Funding

	10 Quarterly sanitary reports 10 Livestock disease Data bases at the ZVCs and national levels		
2.1.2 Participatory disease surveillance	120 PDS done by the LGA's	Reports	Funding
2.1.3 Sentinel surveillance	8 sentinel herds/flocks established (1 per zone) 30 monitoring missions conducted	Inventory of herds/flocks Reports	Funding and farmer compliance
2.2 Outbreak response and tracing			
2.2.1 Outbreak investigation including tracing	100% of outbreaks investigated	Reports	Funding
2.3 Immediate control measures			
2.3.1 Biosecurity (especially movement control)	100% prosecution of offenders 100% quarantine imposition and enforcement enhanced	Reports Gazette/quarantine notices	Availability and aware of veterinary law among law enforce
2.3.2 Vaccination (vaccine and operational funds)	Emergency vaccine stocks Contingency funds available Response teams in place	Reports Store records Response plan	Funding available and teams in place
R3: Post eradication monitoring strengthened			
3.1 Post-outbreak surveillance (sero-monitoring)	100% post outbreak sero surveillance carried out	Reports	Funding
3.2 Review of the impact of control measures (vaccination, bio-security)	100% impact assessment conducted post vaccination	Reports	
3.3 Awareness campaigns through field veterinarians, NGOs, CBOs, FBOs, media (print and electronic)	field days and meetings conducted for every outbreak	Reports	Funding

3.4 Review of preparedness and contingency plans	Reviewed Plan	Plan	Funding
3.5 Application for endorsement of National PPR control programme by the OIE	Dossier prepared	Dossier	Funding
R4: Coordination and management enhanced			
4.1 Foster and develop protocol and coordination mechanism between the PPPs	Quartely and scheduled coordination meeting held	Coordination guideline Meeting reports	Funding
4.2 capacitate epi-units, zonal offices, labs, vehicles, cold chain and support staff development	Procure office consumables, computers, scanners, printers, vehicles, vaccine storage facilities, telephones, faxes 80% coordination staff trained on project management and technical related courses 100% of the zonal supported with vehicles/motor bikes/communication utilities	Delivery notes Store records Training reports	Funding
R5. PPR eradicated and free status verified by OIE			
5.1 Surveillance activities (random surveys for proof of presence or absence of PPR).	8 national surveys (1 survey per zone)	Reports	Funding
5.2 Review of emergency preparedness and contingency plans	Reviewed Plan	Plan	Funding
5.3 Consolidate PPR like materials	Develop guideline and plan for consolidation	Reports and guideline available	Funding
5.4 Commemoration of eradication	Commemoration event	Report	Funding

Annex 2 –Action plan for the first 5 Years

1. Introduction

Given that PPR has already been targeted by FAO and OIE as a high priority disease for global eradication, Tanzania like other countries (where disease is endemic) has embarked into global eradication initiatives. This plan which is fully aligned to the regional, continental and global eradication efforts elaborate activities that will be undertaken and monitored over the coming 5 years in line with the global target of eradication by 2030.

2. Objectives and approach

The objective is to reduce the incidence of PPR in endemic foci, prevent new incursion and further spread into free areas based on PPR generated data over years and disease risk maps.

Specific objective(s):

- PPR control and Eradication
- Strengthening Veterinary Services
- Improving the prevention and control of other major diseases of Small ruminants

3. Action plan

The aligned national action plan for the first five years will target 4 main components and 13 sub-components. The activities and sub-activities, including resources required and implementer are detailed in the below matrix

Annex 3 : The main deliverable in the first 5 years; including the main deliverables for each component

Phase 2: Control

NO.	ACTIVITY	SUB-ACTIVITY	REQUIREMENTS/ RESOURCES	IMPLEMENTOR	TIMEFRAME					COST	EXPLANATORY NOTES
					Yr 1	Yr 2	Yr 3	Yr 4	Yr 5		
1.	Pre &Post-vaccination sero-status and monitoring	Pre & Post-survey sensitization	Communication materials, scanners, printers, computers	National/Dev Partners/NGO's/LGA's							Developing, printing, distribution, mass media fees, Extra duty allowances
		Field surveys	Operational funds: field and laboratory materials (field and sampling equipment)	LGA's&ZVCs							DSA, Purchase of fuel Purchase of lab and field consumables
2	Laboratory sample processing and analysis	Sample storage and testing	Test kits, shipping materials, and other laboratory consumables and utilities, Extra duty allowances	National/ZVCs							For 5 labs, PPR and SRDs
		Training and workshops	Training funds	National/ZVCs/LGA's							Refresher training of laboratory and field staff on field survey and new tests
		Shipping of samples to local, regional and Reference laboratories	Operational funds	National and LGA's							For 5 labs, 3 years, PPR and SRDs

2.	Targeted vaccinations in high risk zones/areas including managing other SRDs diseases	Purchase of vaccines, vaccination	PPR vaccine-18 milion doses CCPP vaccine-18 milion doses S& G vaccine-18 milion doses Vaccination equipments Operational funds.	National, private sector, Development Partner							Purchase of PPR vaccine@120 Tshs.per dose CCPP@240Tshs per dose S&G@140 Tshs per dose Payment of staff allowances, Other vaccination consumables
		Pre-vaccination sensitization	Awareness materials Operational funds	ZVC/LGA's, Private sector							DSA, Communication materials, hire of vehicles , purchase of fuel
3	Promote and facilitate field validation and use of technologies for disease detection, reporting and control	Identify researcher, technology and site, Develop terms of reference	Testing kits Technology package i.e. real time surveillance kit Operational funds	National,LGA's, ZVCs, Private sector, SUA, NM-AIST,TVLA,TAWIRI							Purchase of testing kits, vaccine DSA
4.	Routine Surveillance	Surveillance (syndromic, active passive surveillance)	Disease reporting forms Transport Operational funds	LGA's &ZVCs							Printing of disease reporting forms, DSA , Purchase of fuel field consumables
5.	Strengthen sanitary measures	Market, slaughter house, border post inspection	operational funds, transport	LGA's &ZVCs							Payment of staff allowance Purchase of fuel
6.	Awareness creation and enhance participation of producers and other	Joint meetings, Workshops Seminars Field days	Operational funds ITC materials -posters, stickers, fliers, T- shirts etc	National, Private sector, Researchers, Pharmaceutical companies							Preparation of visibilities materials, printing and distribution,

	stakeholders including researchers and wildlife	Conferences									DSA, Venue, refreshments
7.	Improve animal health service delivery and attend outbreak investigation and tracing	Activate preparedness and rapid response capacities	Operation funds, training and field equipments/ consumables	National & LGA's							Training, mentoring and establishment of one RRT per LGA's, DSA ,Purchase of consumables – vaccine and field piloting
		Develop technology for disease detection and control	Conduct quality assurance for PPR thermotolerant vaccine, validate rapid pen side diagnostic test, validate disease capture and reporting tools(mobile based)	National/ ZVCs, LGA's/ Communities/ researchers							
		Facilitate information capture, flow, share and use along the value chain	Operational funds training	National & LGA's							Training, DSA, Purchase of consumables
		Engage community to enhance reporting and feedback	Airtime, Technical backstopping	LGA's							Facilitation of the additional disease reporters. Buy additional device/ phones for the LGAs based community
8.	Update disease risk maps and revise target and intervention	Review and update preparedness and contingency plans	equipment, human resource, ICT facilities	National & ZVCs							Purchase of computers, printing, scanners, photocopier and communication materials
		Carry out drill and simulation (field & table top simulation)exercises	equipment, human resource, communication	National/ZVCs							Resource expert, DSA, Simulation

			facilities							consumables
9.	Develop and implement effective communication strategy	Develop communication messages targeting various stakeholders, Validation, Dissemination	human resource, stationary, facilitation	National/ Development Partners						DSA,Computer, scanners and printers, Venue hire-validation workshop Distribution, Fare refunds, refreshments etc
		Print PPR control messages for the different stakeholders	Posters, banners, brochures, flyers,	National/ZVCs						Printing XXX copies of each of the control messages per LGA's or per clusters of stakeholders
		Disseminate PPR and SRDs control measures	Local community communication channels, TVs, Radio, Airtime	National/ZVCs/LGAs/NGO'S						Purchase public addresses, hire vehicles, target market places, schools, churches, mosques
10.	Foster and develop protocol and coordination mechanism between the PPPs	Conduct coordination and feedback workshops for partners on PPR control	Workshop costs- venue hire, Allowances, resource person, Stationary	LGA's						xxx workshop per LGA'S each with about 30 people @ 4000 per person for 2 days per LGA's
11	Build and strengthen capacity at all levels	Purchase or renovate labs, vehicles, cold chain, Training	Investment and operational funds	National						Purchase xx 4w vehicles, xxx m/cycles, Renovate 8 ZVCs, 4cold room, retool 6 labs,Train 10ZVCManagers, 150 DVOs, 400 Field officers
12.	Coordination	Secretariat costs	Operating funds, equipments							Stationeries, allowances, computers, scanners, photocopiers, utilities
	Sub total									

Phase 3: Accreditation phase

NO.	ACTIVITY	SUB-ACTIVITY	REQUIREMENTS/ RESOURCES	IMPLEMENTER	Time frame			COST	EXPLANATORY NOTES
					Yr 1	Yr 2	Yr 3		
1.	Undertake periodic surveillance and early detection activities	Implement passive, participatory and sentinel surveillance	surveillance & Lab reagents/ equipment, and operational funds	National / ZVCs/LGA's					Purchase of field consumables and operating funds
2	Post outbreak seromonitoring and tracing	Seromonitoring, target surveillance and tracing back	Surveillance & Lab reagents/ equipments, and operational funds	National / ZVCs/LGA's					
3	Review and update Preparedness and contingency Planning	Review / update emergency preparedness	Meetings costs	National/ZVCs/LGA'S/stakeholders along the value chain					Venue hire, stationaries, allowances
4.	Review and asses impact of control measures(vaccination & biosecurity)	Develop ToT, Implement impact study Provide feedback	Assessment costs	National/ researchers					Consultant fee, venue hire, stationeries, allowances
4.	Strengthening awareness and advocacy	Develop and disseminate publicity materials	Printing and distribution cost	All stakeholders					Printers, computers, scanners, photocopier Allowances
5.	Strengthen sanitary measures	Market, slaughter house, border post inspection	operational funds transport	LGA's & ZVCs					Payment of staff allowance Purchase of fuel
6.	Developing dossier and application for	Draft dossier	Draft team	National					Venue hire, purchase fuel, stationaries and

	endorsement								allowances
7.	Coordination	Overseer of Strategy implementation	Secretariat cost	National					Office consumables, transport, computers, scanners, allowances
	Sub total								

Phase 4: Post eradication phase

NO.	ACTIVITY	SUB-ACTIVITY	REQUIREMENTS/ RESOURCES	IMPLEMENTER	Time frame				COS T	EXPLANATORY NOTES
					Yr 1	Yr 2	Yr 3	Yr 4		
1.	Maintain surveillance activities	Conduct random surveys(passive &syndromic) to proof absence of virus	surveillance equipment, and operational funds	National / ZVCs/LGA’s						Purchase of field consumables and operating funds
2	Monitor virus activity	Conduct periodic sero survey	surveillance &lab equipment, and operational funds	National / ZVCs/LGA’s						Purchase of field& lab consumables and operating funds
3	Strengthening awareness and advocacy	Develop and disseminate publicity materials	Printing and distribution cost	All stakeholders						Printers, computers, scanners, photocopier Allowances
4	Take inventory of virus containing material	Develop disposal plan	Operating funds	National/ZVCs						Allowances
5.	Review and asses socio-economic impact of PPR &SRDs control	Develop ToT, Implement impact study Provide feedback	Assessment costs	National/ researchers						Consultant fee, venue hire, stationeries, allowances

6	Document good practices	Compile reports	Operating funds	National						Lunch allowances
	Sub total									

Annex 4: Guiding Principles

Component 1: Enabling environment promotion

Effective management and eventual eradication of PPR and other SRDs depends on efficient Veterinary Services (VS). Efficient VS refer to the situation whereby the VS is capable of meeting the minimum critical competencies required in order to move from one stage to another. Therefore, VS capacity must be reinforced as the country moves along the PPR Stages ('progressive institutionalisation of PPR prevention and control'). Capacities building in terms of training of veterinary officers from central and peripheral level on value chain and risk analysis will be the key areas of focus. The area of focus will be striving towards full filling all 12 Critical Competencies (CCs) and 27 CCs required to move from stage 1 to 2. Other enabling environment include strengthening biosecurity and proper certification through reinforcing existing regulation and laws, provision and accessibility to good vaccines, surveillance and laboratory diagnostics services and adequately and timely accessible to operational funds.

Sub-component 1.1: PPR strategy and technical plans

The National PPR and SRDs control strategy indicate objectives and activities to be undertaken in the next five years, together with the associated costs, with the overall objective of achieving PPR eradication in line with the PPR global Eradication programme by 2030. Achieving this will require a sound and tested operational plans that include communication strategy, field surveillance plan, reporting protocol, diagnostic protocol, sample handling and storage protocols, contingency plan – that stipulate and identify key stakeholders and their roles.

Sub-component 1.2: Stakeholder awareness and engagement

Small ruminants value chain stakeholders, policy makers and donors, regional and international organizations awareness on various development challenges along the PPR control pathways is essential if they are to participate effectively in disease eradication effort. Currently, the extensive nature of SR production systems and the multiple smallstock players involved limits the access of stakeholders to information. Therefore stakeholders will be engaged at every stage of programme i.e. from preparation to implementation. The nature and level of engagement should take into account the respective roles of stakeholders. Producer interest will be on disease information; how to recognize PPR (and other diseases) in flocks and report; what control measures are available; how, when and where to access these measures and who to contact; costs involved and benefits that would accrue due to control; and the roles they are expected to play in eradication. On the other hand, traders would be interested in how PPR impacts on trade.

Sub-component 1.3: Legal framework

An adequate legal framework is a cornerstone that provides national and local VS with the authority and capability to implement PPR eradication activities. It also constitutes an enabling environment for stakeholder involvement. For each stage toward eradication, the national legislation framework in place and local bylaws that might be required will authorize and guarantee the activities that need to be carried out. Currently, Tanzania legal framework fully support the PPR eradication and other TADs related diseases.

Subcomponent 1.4: Strengthening Veterinary Services

Strengthening VS is one of the PPR Eradication programme principal component. Over the whole period of control and eradication efforts, the number of key VS such as strengthening of laboratories, capacity building in terms of field surveillances and training will compliment greatly in improving VS. Based on recent OIE PVS, Gap, Laboratory, statutory body and follow up reports, much of the identified gaps will be addressed in the course of implementing this strategy. The PVS evaluation reports will serve as reassessment framework during the implementation of the PPR eradication programme to ensure that technical capability and resource capacities are in place, as we progress towards the PPR eradication goals. The ongoing laboratory and veterinary education twinning programs will further enhance and strengthening VS.

Component 2- Support to the diagnostic and surveillance systems

Managing PPR requires an assessment of the epidemiological situation and the establishment of a good surveillance system. Field structured surveillance activities - passive, risk based, active syndromic surveillance that includes participatory methods, outbreak investigation, and wildlife surveillance will be designed and implemented by epidemiologists, while sample analysis will be carried out in the designated zonal veterinary diagnostic laboratories under supervision of Central Veterinary Laboratory, Tembeke. Field validation of rapid pen-side diagnostics tests and test to distinguish immunity acquired by vaccine and natural infection will be promoted in the course of implementing this plan. Other field trials such as the evaluation of thermotolerant PPR vaccine, use of combine PPR and other SRDs vaccine will be promoted. At the zonal level, national level, permanent dialogue, trust and institutionalized collaboration will be established between epidemiologists and laboratory diagnosticians to successfully implement the PPR eradication programme. Because of the transboundary nature of PPR, the efficient eradication of this disease requires networking of all countries, whether infected or at-risk, in a given region. In consideration of that fact, the National PPR eradication programme will follow a regional approach, with regular coordination and crossborder meetings and exchanges of information between stakeholders of different countries. Epidemiological and laboratory networks are forums for such close collaborations, therefore will be encouraged.

Sub component 2.1: Epidemiological assessment

Epidemiological assessment will be an ongoing process, repeated annually, and the results will be reported during national coordination meetings using the PMAT tool to inform implementation progress. In order for this subcomponent to be fully achieved, a functional epidemiological assessment system that provides sensitive and realistic information on the distribution of PPR is needed. Based on the country small ruminant production profile, various approach will be explored where appropriate. Production system, value chain and ecosystem (wildlife/livestock interface) are some of the approach system to be employed in order to generate data that will inform surveillance and control strategies to be used. The epidemiological assessment will be conducted by a national team of experts with specific guidance and training on assessment procedures and the participation of external expert consultants where necessary. Disease investigation and participatory disease surveillance skills will be invaluable in this process, but more is needed. Those responsible for producing assessments will need training in qualitative risk analysis and mapping concepts, as well as a solid foundation in the principles of infectious disease epidemiology. Capacity-building for assessments will need to provide guidance on how to pull together this diverse information into a coherent targeting and eradication plan.

Sub-component 2.2: Strengthening of surveillance systems and laboratory capacities

Surveillance is critical to the success of the PPR eradication programme. Surveillance will provide essential information regarding ongoing epidemiological assessments for strategy setting, targeting vaccination efforts and collecting biological samples(viral isolates) for laboratory analysis and molecular epidemiology. Surveillance will also help to measure progress and cumulatively contribute to the evidence base for validating eradication. At the outset of the programme, the purpose of surveillance will be to inform strategy

development, future PPR research direction and enable eradication. Surveillance will focus on identifying patterns of transmission, evolution of new PPRV strain/ lineage. The objective is to identify populations that are critical in maintaining the virus so as to develop the appropriate vaccination strategy and vaccination planning.

Sub component 2.3: Epidemiology and laboratory networks

National and regional epidemiology and laboratory networks will be instrumental during the implementation of the PPR eradication programme leading to the final eradication of PPR and other SRDs. Promoting producers, traders, transporters associations or groups and strengthening national surveillance network (TansNet) and national laboratory networks will be a priority need. The role of the networks will be towards sharing information on disease status, pattern within the country and beyond with the broad aim of synergizing control effort between countries. PPR is one of the classic TADs – which does not respect borders and therefore its control requires combined regional and continental efforts.

Component 3- Measures toward PPR eradication

PPR eradication efforts requires national commitments in terms of resources (physical and funding) and combination of different tools, which include vaccination, improved biosecurity, animal identification, movement control and quarantine measures. These tools should be adequately supported by existing policy (Livestock Policy 2006) and legal framework instruments (ie Animal Disease Act of 2003). These individual tools are likely to be applied at different levels of intensity when Tanzania is moving along the pathway. The National PPR Eradication programme will support in applying the appropriate tools, taking into consideration current epidemiological situation. Further, intensive advocacy, lobbying and mobilization of resources targeting various key stakeholders and partners will be critical in the course of implementing this strategy.

Sub-component 3.1: PPR preventive and control measures

This sub-component focuses on five main areas of work:

- vaccination
- post-vaccination evaluation
- improved biosecurity including reinforcement of animal movement, quarantine facilities and certification at critical points i.e. slaughter house, Livestock market and border post
- Strengthening awareness along the value chain (disease recognition and reporting)
- contingency plans
- other prevention and control measures.

Sub component 3.2: Demonstration of PPR freedom

Applying for OIE-certification PPR-free status will be carried out at a national level, PPR coordination team will advise directorate of Veterinary services to apply after successful implementation of the eradication programme and come up with epidemiological data that support absence of PPRV in the country.

Sub-component 3.3: Control of other small ruminant diseases in support of PPR eradication

The National PPR eradication programme advocates combining PPR with strategies to control other significant diseases of small ruminants, for better cost-effectiveness and optimum use of resources and as a motivation to enhance farmers compliance and improving VS. For example, syndromic and participatory surveillance for CCPP and Sheep/goat pox can provide information that helps formulate control strategies for other diseases. Surveillance can help national authorities to recognise other diseases that impact on production and welfare, and add a degree of control to PPR eradication activities.

Component 4: Coordination, Management and partnerships

The success of the National PPR eradication programme requires the establishment of functional coordination mechanisms at national, regional and global levels.

Sub-component 4.1: National level

The programme will support country to establish, within the Ministry of Agriculture, Livestock and Fisheries, a PPR national committee to oversee the implementation of the plan, advice, mobilise resources and serve as a forum for information sharing, planning, and reporting on progress made and challenges encountered. To consolidate the national control efforts, the Department of Veterinary Service, will appoint a national coordinator – who will be responsible for coordinating all PPR activities and serve as liaison person to the regional and continental group.

Sub component 4.2 With Regional partners and programmes

From global eradication perspectives, Tanzania is grouped under IGAD- a regional block that is responsible for advising and updating member states on day to day PPR control progress. The national coordinator will also be responsible for coordinating all efforts geared towards PPR eradication. Link with PPR researchers, vaccine manufacturers and distributor will be among the activities to pursue. Participation to Regional PPR coordination meetings and updating stakeholders on disease status will form part and responsibility of national coordinator. Other bodies to work with include the Regional Advisory Group (RAG), Regional Epidemiology Network and the Regional Laboratory Networks and REC - EAC, the PPR Secretariat, FAO and OIE) and PAN-VAC. The RAG oversees the implementation of PPR control activities within the region and is therefore responsible for supporting the review on implementation progress including self- and external assessments of the PPR stages.

Sub- component 4.3 With Pan-African and Global partners and programmes

At global level, the PPR Secretariat is responsible for overall coherence and facilitating the collaboration of partners in the GEP, and monitoring its implementation, assessment, refinement and reporting. The national PPR / advisory committee Secretariat will work closely with regional organizations, reference laboratories/centres, technical and research institutions in the region and the global PPR secretariat.

5 Sustainability

The political buy-in and support, commitment, institutional frameworks, engagement of stakeholders and PPP to be established, support from farmers community and the link with innovation and research institute together with Regional and global partners in the control of PPR will contribute to the sustainability of the program in the long run. Additionally, community members, traders, transporters, butchers, will have improved skills to recognize PPR-like signs and other diseases thereby increasing their capacity to fulfil their essential roles in field surveillance. Capacity building at local laboratories (infrastructures and training)

will elevate them to the level of PPR diagnostic centre of expertise and therefore fulfilling the long term benefit of supporting VS, national and international research groups.

6 Risks and assumptions

Key uncertainty, assumptions associated with the strategy and key risks that have significance to national planning and its operationalization includes;

Category	Uncertainty/Risk	Assumption
Administration of the implementation of the strategy	• Low collaboration between stakeholders' participation in implementation of the strategy	• National PPR advisory/steering committee and partners in place
Technology	Fast changing of technology	• No Technological advancement – possibility to fit the existing technology into new/advanced technologies at low cost • Systems can be scalable and meet increased capacity requirements
Finance	• Late application for the funds • Unavailability of funds (domestic and external) • Overwhelming animal health threat/hazard • Delay in getting finance • Change in government priorities over time	• Availability of adequate funding • Dispersed timely and sufficient amount • Funds will be used as per plan • Donor financial support will be available • No high inflation and/or accurate forecasting • Each stakeholder will play the required Role •
Human resource	• High staff turn over • Low deployment rate • Non approval by responsible authorities (Council, delegating of VS to private sector, Treasury Registrar, Utumishi) for hiring/recruitment • Re-allocation of trained staff	• Human resource will be available • Availability of working tools
Social	• Low level of public awareness and participation	• Targeted and sustained advocacy for community participation will be in place

	• hard to reach communities • Social – cultural barriers	
Governance	• Minimal support from politicians • Lack of buy in from political support	• Government buy-in and ownership is in place • Continued political stability • Good practice principles applied at all levels
Natural (Man-made/ natural disaster)	• Unknown disaster happening	• Adequate preparedness and effective & timely response to known hazards
Plan implementation	• Misinterpretation and lack of sense of ownership	• No fragmentation of implementation of plan • Effective coordination at all levels • Full compliance and abide to the plan • Implementers understood their roles and boundaries
Infrastructure	• geography of the country- Inability to deliver services or supplies timely • Long and porous border	• The Plan's core values will address the equity • The plan consider cross border engagement and joint activities i.e. vaccination very vital.

Funding, Monitoring and Evaluation and Communication

4.1 Funding

The estimated budget for PPR eradication for five years is Tshs **94,589,612,800** which will come from GOT, international development partners, NGOs and Foundations which have interest in PPR control. Effort should be made to ensure PPR control is mainstreamed in the national budget line. Potential approach will be through developing evidence based advocacy case studies (socio-economic studies), visual or audio targeting various/key audiences or policy brief detailing best practices based on previous disease eradication. Other potential funders envisaged include public-private partnership, and producer organisation, farmers, traders in cash or in kind. The stakeholders' financial mapping and analysis are shown in Annex 4 and Annex 5 .

4.2 Monitoring and Evaluation

Monitoring and evaluation will follow the PPR monitoring assessment tool for the country, which focus on PPR control and eradication, strengthening veterinary services focusing mainly on national level. M &E will

be based on five components as identified in PPR global strategy component mainly Diagnosis, Surveillance, Prevention and control, legal frameworks and stakeholder's involvement.

4.3 Communication and advocacy

The programme will be supported by strong advocacy and communication coordinated between different stakeholders to increase the awareness, visibility of the national PPR eradication programmes, achievements and ensure effective communication of its activities, results and goals with target beneficiaries, partners and key national and international stakeholders. This will help generate long term commitment, drive implementation of the programmes and foster local partnership and ownership. PPR programme coordinator will ensure the preparation of the necessary documentation and publication demonstrating the progress and achievement of the program, reaching out to funding partners, policy maker and stakeholder within and outside the country.

Annex 4 : Stakeholders financial mapping and Analysis

S/No	Partner	Technical Area	Contributions (cash, in kind or others)
1	FAO	GSHA/EPT-2 component Laboratory (Animal), surveillance Workforce (Animal) GEMPs	Technical support Period: 2017-2019
2	RVC/ DFID/BBRSC	Research/Surveillance – Wildlife/ livestock interface and cross border engagement	Technical Support in Capacity building : surveillance and laboratory diagnosis Period : 2017-2019
3	SIDA/SRC	Research, surveillance	Technical support, laboratory support and Surveillance
4	Finnish Government	Laboratory Biosafety and Biosecurity (Animal Health)	Technical support : diagnostic services and Procurement of Reagents and Supplies Period : 2014-2018
5	SUA-ACE	Laboratory, Training and Research	Laboratory Information System strengthening
6	SACIDS	Surveillance (Animal and Human)	Capacity building of surveillance system ; Training of Health Workers
7	Private sector	Disease reporting and control	• Vaccine/equipment procurement and distribution • sanitary mandate – vaccination • Awareness creation
8	NGO'S/ CBO's	Disease communication	Awareness creation, and community engagement
9	RECs : EAC/IGAD, AU- IBAR	Technical support	Advisory, Lobbying and information sharing

Annex 5: Budget summary by interventions over five years

Indicators(five components)	2017	2018	2019	2020	2021
Surveillance	764,650,000	105,650,000	605,650,000	105,650,000	105,650,000
Diagnosis	42,500,000	46,000,000	46,000,000	46,000,000	46,000,000
Prevention &Control	17,324,895.5	17,354,800	17,404,800	17,554,800	17,554,800
Legal framework					
Stakeholders engagement	234,000,000	155,000,000	175,000,000	165,000,000	175,000
Sub total	1,058,474,895	324,004,800	844,054,800	334,204,800	169,379,800

CHAPTER 9 : REFERENCES

FAO (2008). The impact of peste des petits ruminants (PPR) on livelihoods in the arid and semi-arid lands of Kenya: a case study of Turkana North District of Kenya. pp. 59. Emergency Centre for Transboundary Animal Diseases (ECTAD) Unit, Food and Agriculture Organization of the United Nations (FAO) Eastern Africa, Nairobi, Kenya.

Jones, B. A., Rich, K. M., Mariner, J. C., Anderson, J., Jeggo, M., Thevasagayam, S., Cai, Y., Peters, A. R. and Roeder, P. (2016). The Economic Impact of Eradicating Peste des Petits Ruminants: A Benefit-Cost Analysis. *PLoS One*, **11**, e0149982. doi: 10.1371/journal.pone.0149982

Kgotlele T, Macha ES, Kasanga CJ, Kusiluka LJ, Karimuribo ED, Van Doorselaere J, et al (2014) Partial genetic characterization of peste des petits ruminants virus from goats in northern and eastern Tanzania. *Transboundary and emerging diseases* 61 Suppl 1, 56-62.

Kock R.A. H. M. Wamwayi, P. B. Rossiter, G. Libeau, E. Wambwa, J. Okori, F. S. Shiferaw, T. D. Mlengeya (2006). Rinderpest in East Africa: continuing re-infection of wildlife populations on the periphery of the Somali ecosystem. *Prev. Vet. Med* Vol 75/1-2 pp. 63-80.

Kock R. A., M. B. Orynbayev, K. T. Sultankulova, V. M. Storchkov, Z. D. Omarova, E. K. Shalgynbayev, N. M. Rametov, A. R. Sansyzbay, S. Parida (2015) Detection and genetic characterization of lineage IV peste des petits ruminants virus in Kazakhstan *Transboundary and Emerging Diseases*, 62(5), 470–479. doi:10.1111/tbed.12398

Mahapatra, M., Sayelel K., Muniraju, M., Eblate, E., Fyumagwa, R., Shilinde L., Maulie Mdaki, M., Keyyu, J., Parida, S., Kock R.(2015) Spill-over of Peste des Petits Ruminants Virus from domestic sheep and goats to wild ruminants in the Serengeti Ecosystem, Northern Tanzania *Emerging Infectious Diseases* 21 (12)DOI: 10.3201/eid2112.150223

Mariner, J.C., House, J.A., Mebus, C.A., Sollod, A.E., Chibeu, D., Jones, B.A., Roeder, P.L., Admassu, B., van't Klooster, G.G. (2012) Rinderpest eradication: appropriate technology and social innovations. *Science* 337, 1309-1312

Misinzo G, Kgotlele T, Muse EA, Van Doorselaere J, Berg M, Munir M. (2015) Peste des petits ruminants virus lineage II and IV from goats in southern Tanzania during an outbreak in 2011. *British Journal of Virology* 2(1), 1-4.

OIE-FAO (2015). *Global Strategy for the Control and Eradication of PPR*. World Organisation for Animal Health, United Nations Food and Agriculture Organisation.

Mahapatra, M., Sayelel K., Muniraju, M., Eblate, E., Fyumagwa, R., Shilinde L., Maulie Mdaki, M., Keyyu, J., Parida, S., Kock R.(2015) Spill-over of Peste des Petits Ruminants Virus from domestic sheep and goats to wild ruminants in the Serengeti Ecosystem, Northern Tanzania *Emerging Infectious Diseases* 21 (12)DOI: 10.3201/eid2112.150223.

Swai, E.S. and Neselle, O.M. (2010).Using participatory epidemiology tools to investigate contagious caprine Pleuropneumonia (CCPP) in Maasai flocks, Northern Tanzania. *International Journal of Animal and Veterinary Advances*, **2(4)**: 141

Annex 6: Distribution of sheep and goats by farm classification and districts

Table 1. Total Number of Sheep and Goats per district Rural/Urban as of 26th August 2012						
	TOTAL		RURAL		URBAN	
	Goats	Sheep	Goats	Sheep	Goats	Sheep
Tanzania	14,979,340	4,390,227	13,941,027	4,203,290	1,038,313	186,937
Dodoma	1,025,756	258,011	973,895	250,889	51,861	7,122
Kondoa District Council	150,624	28,011	144,502	27,591	6,122	420
Mpwapwa District Council	178,859	44,526	172,758	44,198	6,101	328
Kongwa District Council	101,881	27,966	96,013	26,830	5,868	1,136
Chamwino District Council	187,054	50,264	182,245	49,219	4,809	1,045
Dodoma Municipal Council	115,046	21,636	86,809	17,481	28,237	4,155
Bahi District Council	134,352	51,447	134,352	51,447	0	0
Chemba District Council	157,940	34,161	157,216	34,123	724	38
Arusha	1,884,783	842,453	1,813,845	816,051	70,938	26,402
Monduli District Council	345,626	136,519	341,324	135,730	4,302	789
Meru District Council	146,113	56,070	133,841	53,463	12,272	2,607
Arusha City Council	39,986	16,844	0	0	39,986	16,844
Karatu District Council	173,273	61,398	172,341	61,218	932	180
Ngorongoro District Council	708,064	330,231	700,418	326,888	7,646	3,343
Arusha District Council	126,074	72,404	122,607	70,442	3,467	1,962

Longido District Council	345,647	168,987	343,314	168,310	2,333	677
Kilimanjaro	693,824	246,210	608,111	216,013	85,713	30,197
Rombo District Council	142,085	35,340	136,842	34,255	5,243	1,085
Mwanga District Council	98,350	35,255	79,413	28,106	18,937	7,149
Same District Council	137,402	66,218	112,772	52,448	24,630	13,770
Moshi District Council	162,553	43,782	159,481	43,281	3,072	501
Hai District Council	78,959	35,391	58,786	30,653	20,173	4,738
Moshi Municipal Council	10,731	2,236	0	0	10,731	2,236
Siha District Council	63,744	27,988	60,817	27,270	2,927	718
Tanga	816,588	223,149	737,635	212,617	78,953	10,532
Lushoto District Council	106,445	86,113	103,495	84,642	2,950	1,471
Korogwe District Council	110,796	30,458	109,028	30,197	1,768	261
Muheza District Council	47,161	5,218	45,956	5,104	1,205	114
Tanga City Council	43,798	5,787	27,096	4,031	16,702	1,756
Pangani District Council	26,969	5,985	25,713	5,579	1,256	406
Handeni District Council	160,173	16,150	160,173	16,150	0	0
Kilindi District Council	186,418	49,974	186,418	49,974	0	0
Mkinga District	77,368	16,488	75,685	16,380	1,683	108

Council						
Korogwe Town Council	12,808	1,125	4,071	560	8,737	565
Handeni Town Council	44,652	5,851	0	0	44,652	5,851
Morogoro	489,060	128,360	444,611	120,918	44,449	7,442
Kilosa District Council	121,467	27,400	108,420	25,013	13,047	2,387
Morogoro District Council	88,211	20,623	83,772	19,942	4,439	681
Kilombero District Council	27,081	15,002	25,332	14,517	1,749	485
Ulanga District Council	37,054	28,942	35,292	28,321	1,762	621
Morogoro Municipal Council	18,074	2,742	967	25	17,107	2,717
Mvomero District Council	124,925	23,603	121,843	23,235	3,082	368
Gairo District Council	72,248	10,048	68,985	9,865	3,263	183
Pwani	191,472	43,395	164,488	39,772	26,984	3,623
Bagamoyo District Council	101,489	22,051	93,982	21,222	7,507	829
Kibaha District Council	24,024	7,377	22,423	7,063	1,601	314
Kisarawe District Council	16,313	2,550	13,708	2,293	2,605	257
Mkuranga District Council	8,975	2,138	8,675	2,089	300	49
Rufiji District Council	27,715	7,254	24,395	6,990	3,320	264
Mafia District Council	1,679	146	1,305	115	374	31

Kibaha Town Council	11,277	1,879	0	0	11,277	1,879
Dar-es- salaam	160,367	17,043	0	0	160,367	17,043
Kinondoni Municipal Council	84,039	8,745	0	0	84,039	8,745
Ilala Municipal Council	42,621	4,142	0	0	42,621	4,142
Temeke Municipal Council	33,707	4,156	0	0	33,707	4,156
Lindi	98,328	6,968	77,105	5,815	21,223	1,153
Kilwa District Council	22,725	2,103	19,996	1,993	2,729	110
Lindi District Council	25,461	1,970	24,855	1,798	606	172
Nachingwea District Council	12,627	699	11,819	611	808	88
Liwale District Council	7,044	383	6,383	355	661	28
Ruangwa District Council	15,076	1,234	14,052	1,058	1,024	176
Lindi Municipal Council	15,395	579	0	0	15,395	579
Mtwara	226,077	15,886	209,517	13,673	16,560	2,213
Mtwara District Council	57,225	2,339	55,845	2,233	1,380	106
Newala District Council	63,874	2,929	61,585	2,689	2,289	240
Masasi District Council	34,270	2,298	32,902	2,127	1,368	171
Tandahimba District Council	47,547	6,713	42,728	5,623	4,819	1,090
Mtwara Municipal	4,646	486	1,122	203	3,524	283

Council						
Nanyumbu District Council	12,659	804	11,551	650	1,108	154
Masasi Town Concil	5,856	317	3,784	148	2,072	169
Ruvuma	315,626	25,828	280,686	23,452	34,940	2,376
Tunduru District Council	45,296	3,325	44,380	3,272	916	53
Songea District Council	48,591	2,250	45,939	1,957	2,652	293
Mbinga District Council	111,073	11,956	101,918	11,639	9,155	317
Songea Municipal Council	17,347	1,248	0	0	17,347	1,248
Namtumbo District Council	46,206	3,293	42,562	2,842	3,644	451
Nyasa District Council	47,113	3,756	45,887	3,742	1,226	14
Iringa	201,648	43,147	169,242	38,907	32,406	4,240
Iringa District Council	98,055	27,992	92,215	26,257	5,840	1,735
Mufindi District Council	26,971	5,302	25,215	5,032	1,756	270
Iringa Municipal Council	20,970	1,678	0	0	20,970	1,678
Kilolo District Council	53,097	7,723	51,812	7,618	1,285	105
Mafinga Town Council	2,555	452	0	0	2,555	452
Mbeya	321,680	58,581	274,875	49,887	46,805	8,694
Chunya District Council	99,168	17,500	84,112	14,707	15,056	2,793
Mbeya District	62,297	6,485	59,930	6,187	2,367	298

Council						
Kyela District Council	4,675	481	3,901	382	774	99
Rungwe District Council	31,706	1,127	30,647	1,044	1,059	83
Mbarali District Council	109,682	31,101	96,285	27,567	13,397	3,534
Mbeya City Council	14,152	1,887	0	0	14,152	1,887
SONGWE	235,350	18,386	225,888	17,428	9,462	958
Ileje District Council	38,956	4,417	37,758	4,321	1,198	96
Mbozi District Council	83,416	6,485	78,990	6,099	4,426	386
Momba District Council	110,032	7,049	109,140	7,008	892	41
Tunduma Town Council	2,946	435	0	0	2,946	435
Singida	829,155	292,579	805,187	285,710	23,968	6,869
Iramba District Council	143,482	53,702	140,092	52,315	3,390	1,387
Singida District Council	103,657	55,920	103,119	55,596	538	324
Manyoni District Council	184,453	51,893	177,146	50,847	7,307	1,046
Singida Municipal Council	45,200	16,100	38,212	14,243	6,988	1,857
Ikungi District Council	214,025	61,115	211,639	60,042	2,386	1,073
Mkalama District Council	138,338	53,849	134,979	52,667	3,359	1,182
Tabora	953,991	269,456	932,075	265,641	21,916	3,815
Nzega District Council	199,943	53,989	197,329	53,445	2,614	544
Igunga District Council	288,460	93,324	281,525	91,851	6,935	1,473
Uyui District Council	209,706	69,467	208,450	69,217	1,256	250

Urambo District Council	43,807	5,860	41,954	5,671	1,853	189
Sikonge District Council	76,687	23,498	75,944	23,455	743	43
Tabora Municipal Council	31,882	5,586	23,465	4,286	8,417	1,300
Kaliua District Council	103,506	17,732	103,408	17,716	98	16
Rukwa	233,399	35,488	203,572	31,178	29,827	4,310
Kalambo District Council	33,951	3,573	33,535	3,555	416	18
Sumbawanga District Council	103,025	14,396	96,976	14,151	6,049	245
Nkasi District Council	73,568	16,577	56,859	12,916	16,709	3,661
Sumbawanga Municipal Council	22,855	942	16,202	556	6,653	386
Kigoma	361,526	53,137	340,111	50,007	21,415	3,130
Kibondo District Council	68,494	2,869	65,204	2,746	3,290	123
Kasulu District Council	48,676	4,898	47,503	4,837	1,173	61
Kigoma District Council	44,922	11,682	44,216	11,456	706	226
Kigoma-Ujiji Municipal Council	10,110	1,846	0	0	10,110	1,846
Uvinza District Council	61,965	13,486	59,720	13,081	2,245	405
Buhigwe District Council	53,765	13,154	53,765	13,154	0	0
Kakonko District Council	49,492	2,236	48,442	2,165	1,050	71
Kasulu Town Council	24,102	2,966	21,261	2,568	2,841	398
Shinyanga	620,795	196,998	594,302	192,237	26,493	4,761

Shinyanga Municipal Council	43,200	14,828	29,521	12,417	13,679	2,411
Kishapu District Council	189,647	71,748	186,079	70,722	3,568	1,026
Shinyanga District Council	157,227	60,714	156,912	60,629	315	85
Kahama District Council	182,091	40,616	178,649	40,244	3,442	372
Kahama Town Council	48,630	9,092	43,141	8,225	5,489	867
Kagera	730,300	75,478	713,851	73,653	16,449	1,825
Karagwe District Council	105,542	12,160	103,121	11,933	2,421	227
Bukoba District Council	70,826	6,343	69,927	6,268	899	75
Muleba District Council	134,818	25,553	133,320	25,296	1,498	257
Biharamulo District Council	116,232	6,616	115,039	6,442	1,193	174
Ngara District Council	148,127	7,758	143,646	7,325	4,481	433
Bukoba Municipal Council	5,039	550	0	0	5,039	550
Missioni District Council	49,540	4,331	48,622	4,222	918	109
Kyerwa District Council	100,176	12,167	100,176	12,167	0	0
Mwanza	574,942	129,678	516,025	121,167	58,917	8,511
Ukerewe District Council	84,447	914	79,383	837	5,064	77
Magu District Council	76,627	22,618	74,234	22,041	2,393	577
Nyamagana Municipal	17,601	2,568	0	0	17,601	2,568

Council						
Kwimba District Council	132,671	52,162	125,950	49,806	6,721	2,356
Sengerema District Council	136,755	16,333	130,549	15,804	6,206	529
Ilemela Municipal Council	17,886	1,878	0	0	17,886	1,878
Misungwi District Council	108,955	33,205	105,909	32,679	3,046	526
Mara	757,428	342,892	723,954	334,319	33,474	8,573
Tarime District Council	108,512	48,912	103,150	47,610	5,362	1,302
Serengeti District Council	192,912	112,276	187,654	109,755	5,258	2,521
Musoma District Council	73,010	13,115	72,262	13,063	748	52
Bunda District Council	160,419	75,642	151,644	74,297	8,775	1,345
Musoma Municipal Council	9,968	1,963	0	0	9,968	1,963
Rorya District Council	104,627	41,464	102,352	40,148	2,275	1,316
Butiama District Council	107,980	49,520	106,892	49,446	1,088	74
Manyara	1,542,414	581,246	1,503,308	568,568	39,106	12,678
Babati District Council	220,219	85,380	217,065	84,590	3,154	790
Hanang District Council	229,774	92,879	224,802	90,541	4,972	2,338
Mbulu District Council	222,219	105,825	210,574	100,161	11,645	5,664
Simanjiro District Council	509,129	186,475	501,645	185,208	7,484	1,267

Kiteto District Council	328,085	102,116	325,463	101,846	2,622	270
Babati Town Council	32,988	8,571	23,759	6,222	9,229	2,349
Njombe	113,681	21,747	103,006	19,874	10,675	1,873
Njombe Town Council	13,101	2,992	10,379	2,487	2,722	505
Wang'ing'ombe District Council	28,815	8,552	27,690	7,911	1,125	641
Makete District Council	31,866	6,019	29,905	5,888	1,961	131
Njombe District Council	6,947	876	6,677	780	270	96
Ludewa District Council	27,386	2,074	24,421	1,937	2,965	137
Makambako Town Council	5,566	1,234	3,934	871	1,632	363
Katavi	177,808	25,703	155,001	23,700	22,807	2,003
Mpanda Town Council	10,626	1,126	5,469	680	5,157	446
Mpanda District Council	44,298	5,147	28,868	3,905	15,430	1,242
Mlele District Council	122,884	19,430	120,664	19,115	2,220	315
Simiyu	929,895	389,366	913,283	385,302	16,612	4,064
Bariadi District Council	193,772	92,902	188,309	91,267	5,463	1,635
Itilima District Council	147,762	62,906	147,171	62,703	591	203
Meatu District Council	285,969	114,379	283,319	113,733	2,650	646
Maswa District Council	217,677	88,721	212,562	87,797	5,115	924
Busega District Council	84,715	30,458	81,922	29,802	2,793	656
Geita	427,622	47,692	403,332	45,645	24,290	2,047
Geita District Council	167,885	12,730	155,237	11,690	12,648	1,040
Nyang'hwale	57,445	11,322	57,445	11,322	0	0

District Council						
Mbogwe District Council	53,492	6,441	52,506	6,376	986	65
Bukombe District Council	55,585	5,497	50,709	5,105	4,876	392
Chato District Council	93,215	11,702	87,435	11,152	5,780	550
Kaskazini Unguja	10,394	273	10,019	250	375	23
Kaskazini A District	5,728	180	5,485	157	243	23
Kaskazini B District	4,666	93	4,534	93	132	0
Kusini Unguja	18,190	221	16,828	219	1,362	2
Kati District	11,003	208	10,840	208	163	0
Kusini District	7,187	13	5,988	11	1,199	2
Mjini Magharibi	14,700	445	7,332	96	7,368	349
Magharibi District	12,319	296	7,332	96	4,987	200
Mjini District	2,381	149	0	0	2,381	149
Kaskazini Pemba	9,259	193	8,083	168	1,176	25
Wete District	2,799	58	2,290	41	509	17
Micheweni District	6,460	135	5,793	127	667	8
Kusini Pemba	13,282	218	11,860	134	1,422	84
Chake Chake District	6,128	125	5,011	41	1,117	84
Mkoani District	7,154	93	6,849	93	305	0

Source: Tanzania Population House Census 2012 – Number of Livestock.