NATIONAL AFRICAN SWINE FEVER PREVENTION AND CONTROL PLAN

2024

Second Edition

1 PREVENTION STRATEGIES FOR ASF

1.1 Surveillance

During the normal time when there is no report of ASF outbreaks in the neighbouring countries, as a preventive measure for early detection, passive clinical and laboratory surveillance must be undertaken in both domestic and wild pigs.

1.1.1 In Domestic pigs

Clinical surveillance

Clinical surveillance is aimed at the detection of clinical signs of ASF at the farm level and it should be carried out regularly in the high-risk areas, targeting commercial, free scavenging farms, stray and Tshethar pigs. The concerned livestock officials should immediately report any suspect cases of pig morbidity and mortality within their jurisdiction to the National Centre for Animal Health.

Laboratory surveillance

Along with clinical surveillance, laboratory surveillance should also be carried out as and when required using appropriate laboratory diagnostic tests. Histopathological findings such as massive karyorrhexis in lymphoid tissues, often accompanied by haemorrhage and the S-S (Schweiger-Seidel) sheaths of the spleen with virtual obliteration are indicative of ASF infection.

1.1.2 In Wild Boars

Observation of unusual morbidity or mortality in the wild boars should be reported to the nearest livestock centres, and the livestock officials in collaboration with the officials from the Department of Forests and Park Services (DoFPS) and other relevant stakeholders such as the Royal Society for Protection of Nature (RSPN) shall investigate to rule out ASF. Spatial and temporal distributions of wild boars and their overlap with domestic pigs should be studied to develop risk-based surveillance in wild pigs. Prevalence of hunting activity should also be studied by the concerned DoFPS to understand the risk of transmission of ASFv from wild to domestic pigs and vice-versa.

1.2 Swill feeding control

Every effort should be made to prevent the feeding of food and kitchen waste containing pig products, including from international aircraft, as this constitutes a high risk for the introduction of ASFv into the country. If domestically generated swill is fed to the pigs, it

should be done only after boiling at the temperature above 70^{o}C for more than 30 minutes. Animal owners should be educated on the risk of feeding swill to the pigs.

1.3 Containment of pigs

The presence of stray and poorly controlled pigs constitutes a high risk for the entry and rapid spread of ASF. There may be significant delays in recognition of the disease, and elimination will be more difficult. Perhaps the greatest danger is that these pigs have access to the carcasses of dead pigs in the bush or on garbage dumps and the offal of pigs that have died of ASF and been prepared for human consumption. Measures should be taken to encourage the development of properly constructed pig pens and to control the population of stray and scavenging pigs.

1.4 Farm biosecurity

The Ministry has developed an on-farm biosecurity standard for pig farms. The standard constitutes the biosecurity measures to be implemented by each farm. The Department of Livestock should support in terms of biosecurity implementation by farmers. The regulatory authority should visit farms regularly for enforcement of biosecurity measures to protect pigs at the farm from ASFv introduction. Biosecurity in the free scavenging system shall be focused on segregation and feed control.

1.5 Regulatory measures

The imports of the live pig, pig meat and meat products, pig semen, embryos and ova, and other products incorporating pig tissues, such as pharmaceuticals should follow strict quarantine and test procedures in line with Bhutan Health Codes for Import of Animals, 2018.

The pigs rescued for Tshethar purpose should managed in alignment with the “Guidelines on Animal Tshethar Practices 2018”.

1.6 Awareness and education

Pig owners, pig production input suppliers and importers dealing with live pigs and their products should be made aware of the disease and its nature, economic impact, and various preventive measures to avoid ASFv incursion into their farm/ locality and for early detection and response. Through education and awareness, people involved in the pig industry at all levels should be able to weigh the impact of swill feeding and waste management.

Farmers must be advised to maintain a hygienic environment on their farms. It is crucial to regularly clean and disinfect equipment and facilities. Remove any organic matter from sheds, equipment, and vehicles before applying disinfectants. Ensure that vehicles and personnel undergo disinfection upon entering and leaving the farm premises. Proven effective disinfectants such as sodium hydroxide (8/1000 concentration for 30 minutes),

hypochlorite with 2.3% chlorine (30 minutes), formalin (3/1000 concentration for 30 minutes), ortho-phenyl phenol (3% concentration for 30 minutes), and iodine compounds. Equipment that is difficult to disinfect should be exposed to sunlight as an alternative method.

1.7 Capacity building

Since ASF is an exotic and emerging disease, the laboratory capacity and human resource competence on disease investigation, laboratory testing, 3-D operations should be built to enhance early detection of ASF cases and response to the outbreaks in the country.

2 EARLY WARNING AND CONTINGENCY MEASURES

During ASF outbreaks in the neighbouring countries and the region, surveillance and prevention measures should be heightened as it presents a high risk of ASFv incursion into the country. The heightened measures include activation of Veterinary Vigilance Team and Border Vigilance Team, imposing import bans, instituting risk-based active surveillance, enhanced capacity building, farm biosecurity upgrading, awareness and education, etc.

2.1 Activation of Veterinary Vigilance Teams

When there is a report of ASF outbreak in the neighbouring countries and the region which pose an imminent risk of disease introduction, the Department of Livestock should activate Veterinary Vigilance Teams (VVT). The teams comprise veterinarians and veterinary paraprofessionals (including laboratory officials) from the concerned RLDC, RVH & ECs, SVL and Dzongkhag Livestock Sector, and the NCAH if required.

The main role of this team is to assess the risk of disease incursion and early detection of the disease so that disease response and control measures can be implemented in time to prevent its spread to wider areas. The team is also responsible for coordinating the report of their activities and its submission to the NCAH and DoL HQ every week.

2.2 Activation of Border Vigilance Teams

During the alert phase, the Bhutan Food and Drug Authority should activate BVTs as and when there is a report of confirmed ASF outbreak in the neighbouring countries. The BVTs in collaboration with other law enforcement agencies should implement border surveillance for illegal movement of pig and pig products at the point of entries to prevent ASF introduction into the country. In addition, the BVTs will visit the pig farms along the border areas and ensure strict implementation of on-farm biosecurity measures as per the standards. Any suspected ASF cases in the farms or intercepted during the inspection and monitoring must be reported to the nearest livestock health centres for investigation. Regulatory officials shall be regularly updated with the latest information about ASF to pick up the suspect case of ASF.

2.3 Ban on import of pig and related products

BFDA in collaboration with Integrated Check Post (ICPs) should ensure that all regulatory measures, including the import regulations and import ban on pig and pig products originating from ASF affected countries are enforced. BFDA should also enforce any restriction imposed on movement of pigs and pork products within the country through regular inspection and monitoring.

2.4 Enhancement of field staff competence

The veterinarians, veterinary paraprofessionals, laboratory officials, and regulatory officials shall be trained on prevention and response to ASF outbreaks and on their roles and responsibilities to implement NASFPCP through either field simulation or desktop exercise. They should be updated on the current knowledge of ASF and its situation around the world. Also, they should be trained on how to carry out surveillance and the use of rapid diagnostic techniques and test kits.

2.5 Upgrading piggery farm biosecurity

All government and private farms should enhance and implement farm biosecurity in accordance with the pig farm biosecurity standards issued by the Ministry. The farm should have proper boundary fencing to avoid unauthorized entry of people and vehicles and to prevent contact with stray and wild pigs. All entry and exit points should be well guarded, foot-dips shall be made available for daily workers, and effective zoo-sanitary and other control measures must be put in place. This should include changing footwear and the use of gloves, masks, and overcoats while entering and exiting pigsties. BFDA shall ensure the implementation of the bio-security standards by these piggery farms. Where the farms are beyond the reach of BFDA officials, the concerned livestock extension office shall undertake this task.

2.6 Strengthen disease reporting system

Reporting of any suspicious cases of ASF should be done immediately by the fastest means of communication. All pig owners are mandated to report any suspected cases of ASF. Besides, the village *Tshogpa/ Chipon/ reliable person* should be identified as the focal person to report any suspected cases of ASF to the nearest animal health centre. Farmers/ pig owners and the regulatory authorities are mandated to report any ASF-suspected cases to the nearest animal health centres for immediate investigation and response. The farmers can use toll free numbers 1244 (DoL) and 1555 (BFDA) for reporting such suspected cases.

2.7 Awareness and education

Public awareness and education of field staff on ASF and its risks are essential components of this plan. The public, especially pig farmers should be sensitized and educated about the disease to obtain their full cooperation for prevention, early detection, and effective response during ASF outbreaks. Similarly, field extension agents, regulatory inspectors of BFDA , and meat vendors shall be made conversant with the disease. Television and radio programmes, leaflets, brochures, newspapers insert, mobile SMS, social media platforms should be used for public awareness.

Pig-owning farmers must be advised to maintain a hygienic environment on their farms. It is crucial to regularly clean and disinfect equipment and facilities. It is recommended to remove any organic matter from sheds, equipment, and vehicles before applying disinfectants. Ensure that vehicles and personnel undergo disinfection upon entering and leaving the farm premises. Proven effective disinfectants such as sodium hydroxide (8/1000 concentration for 30 minutes), hypochlorite with 2.3% chlorine (30 minutes), formalin (3/1000 concentration for 30 minutes), ortho-phenyl phenol (3% concentration for 30 minutes), and iodine compounds. Equipment that is difficult to disinfect should be exposed to sunlight as an alternative method.

2.8 Strengthen the diagnostic capacity

During ASF outbreaks in the region and neighbouring countries, ASF is deemed to be a high-threat disease to the livelihood of pig rearing farmers and the nation's economy; therefore, consideration should be given to developing capacities for some primary key diagnostic tests, such as RT-PCR, or some rapid diagnostic tests.

As ASF outbreaks are reported in the neighbouring and regional countries, assessment of laboratory capacity at the national, regional and field offices must be carried out and required stock replenishments must be initiated.

3 ACTION/RESPONSE DURING OUTBREAK(S)

The action plan is aimed to address the situation during the outbreak of ASF in the country. All the response actions should be directed towards rapid containment of the disease outbreak at source or elimination within the shortest possible time to avoid spread and possible progression to other areas.

3.1 Strategies for ASF control

In the absence of vaccines and effective treatments, the only available option for ASF control and eventual elimination is stamping out by humane slaughter and disposal of all infected and potentially infected pigs, and disinfection of infected and potentially infected premises. The main elements of a stamping-out policy for ASF are:

- Zoning of the outbreak area into infection, protection and free zones depending on the epidemiological risk assessments.
- The immediate humane slaughter of infected and potentially infected pigs, and safe burial of carcasses and other infected materials.
- Cleansing and disinfection of infected and potentially infected premises.
- Quarantine procedures to contain the disease, including restriction on movement of pigs and risk goods, and prohibitions on the sale of potentially infected pig products.
- Enhanced epidemiological surveillance for ASF.
- Provide prompt and fair compensation to affected owners as per the existing government rule.
- Keeping infected premises without pigs for a safe period.
- Monitoring and evaluation of the outbreak situations as per the requirement.

Given the evolving nature of disease epidemiology and advancements in scientific understanding and interventions, the Department of Livestock is shall periodically update this response plan in line with emerging developments and best practices.

3.2 Case Definitions

During the outbreak investigation, a case definition shall be established in reference to the following definitions.

Table 4: ASF case definitions

Case definition	Description

Suspect case	Clinical signs consistent with ASF; or an epidemiologic link to ASFv, or a non-negative result by a serological antibody screening assay conducted as part of a surveillance activity.
Presumptive positive case	A suspect case or any animal that is positive for ASFv antigen and/ or antibodies by rapid diagnostic tests at NCAH or any other approved animal health laboratories in the country.
Confirmed positive case	A suspect/ presumptive positive case or any other animal with PCR test positive to ASFv at NCAH or any other approved animal health laboratories in the country.
Negative	Any suspect/ presumptive positive case with a negative PCR test result.

Note: *In any ASF outbreak, case definitions may be updated after the first presumptive positive or confirmed positive case (index case). The case definition will be reviewed throughout the outbreak and modified based on additional information or the changing needs of the elimination effort.*

3.3 Zoning

Zoning is the proclamation of geographical areas in which disease-specific control actions are to be carried out. The zones are concentric areas around known or suspected foci of infection, with the most intensive disease control activities in the inner zones. Zoning is one of the early actions to be taken when there is an incursion of ASF into a country. The size and shape of the zones may be determined by administrative or geographical boundaries or by epidemiological or resource considerations based on the assessment conducted by the disease outbreak investigation and risk assessment team. Pig farms with poor biosecurity measures and away from the zone of infection may certainly be at greater risk than farms with high biosecurity measures within the infected zone.

When ASF is suspected, Dzongkhags shall immediately inform the RLDC/ RVH&ECs and BFDA officials in the respective areas, and immediately conduct a preliminary outbreak investigation. The affected farm or village and the immediate surroundings shall be identified as a Provisional Infection Zone. Based on the epidemiological assessment of risk from the point of suspected place of infection, the areas surrounding the Provisional Infection Zone shall be declared as ban the Provisional Protection Zone. All places with pigs within the Provisional Protection Zone shall be considered at-risk and visited to establish their infection status.

Until the outbreak is confirmed from NCAH and other authorized referral laboratories in the country, the affected Dzongkhag should issue an official ban order for non-movement of live pigs and pork products in and out of the Provisional Infection and Protection Zone. These zones would be re-demarcated after laboratory confirmation of the outbreak, proper outbreak investigation and risk assessment.

3.3.1 Declaration of Infection Zone

To initiate the process of containing African Swine Fever (ASF) outbreaks, the declaration of an Infection Zone is paramount. Upon meeting the confirmed positive case definition for ASF, the risk assessment team will delineate the boundaries of the Infection Zone. The size and shape of this zone will be determined by the Incident Operation Centre (IOC), established post-outbreak confirmation and following the National Incident Command Committee (NICC) convention. Factors influencing its dimensions include topographical features, physical barriers, administrative borders, and epidemiological insights.

The World Organisation for Animal Health (OIE) recommends an Infection Zone radius of at least 10 km in areas with intense livestock husbandry and 50 km in regions with extensive livestock operations. However, in areas or villages where pig population control is inadequate and topographical variations are significant, adhering strictly to these guidelines may prove impractical.

Establishing the Infection Zone entails accurately delineating the extent of the infection focus. It's imperative to recognize well-managed farms that have remained free from infection and not include them within the infected area. Conversely, a broader surveillance radius should be maintained, considering factors such as pig movement patterns determined through market activities and other relevant considerations. In the initial stages of an outbreak, when its extent is not well known, it would be wise to declare larger infection zones and then progressively reduce them as active disease surveillance reveals the true extent of the outbreak.

Stamping-out procedures (3-D: depopulation, disposal and decontamination) should be carried out based on contract tracing and scientific risk assessment. In farms with very good bio-security practices, the culling may only be initiated based on the test results and thorough risk assessment.

Once the outbreak is confirmed and the NICC is convened if required, an executive order shall be sent out from the Ministry or the Department declaring the outbreak and recommending activation of a Technical Working Group and establishment of the Incident Operation Centre. However, the incident command structure and its level of activation may vary depending of the outbreak's extent and severity.

The confirmed outbreak notification and implementation of required bans and restrictions shall be sent to the general public by the Dzongkhag or Thromde administrations and the relevant agencies such as DoFPS, BFDA, RBP, etc. shall be informed as well.

3.3.2 Declaration of Protection Zone

This zone is much larger and surrounds the Infected zone. It may cover multiple villages, gewogs, or dzongkhags depending on the infected zone delineated. The size and shape of the zone shall be determined by the risk assessment team and will be used for enhanced surveillance activities in this zone to monitor the possible spread of infection. Inspection, movement control, surveillance, screening, and sanitary measures will be the main tasks in the protected zone. In some cases, where the infection spreads uncontrollably, it may cover the whole country.

3.3.3 Declaration ASF-free zone

This encompasses the rest of the country. Because of the potential of ASFv for widespread transmission, it is recommended that all parts of a country experiencing a first outbreak are placed under a high level of surveillance. Regulations preventing the movement of domestic or wild pigs and their products into the free zone from an infected country or zone must be rigorously implemented. Regular inspection and monitoring movement of pigs and their products should be carried out in the free zone.

3.4 Control by stamping out

Based on the recommendation by the Technical Working Group, the implementation of ASF outbreak containment and elimination process by stamping out shall be conducted immediately following confirmation of the disease. These general principles apply to the 3-D Team (depopulation, disposal, and decontamination).

Any update or a change in the response strategy for containment of ASF outbreak shall be intimated by the Department or the Technical Working Group based on the disease epidemiology, risk of further spread, scientific discoveries, socio-economic implications, etc.

3.4.1 Depopulation

Humane killing should be conducted with due consideration to religious sentiments and social obligations (See Annexure). Based on the disease outbreak investigation and risk assessment findings by the IOC, the depopulation infected and at-risk farms must be implemented at the earliest possible.

The method and extent of implementation of depopulation shall be decided by the IOC in consultation with the TWG.

3.4.2 Disposal

Culled animals and all the infected materials should be disposed. The selection of the disposal sites and methods of disposal shall be decided by IOC (See Annexure 12.5)

Disposal of Carcass

Burial may be the best means of disposal under certain conditions and a pit should be prepared as soon as the diagnosis is confirmed. Materials that cannot be disinfected such as wood and cardboard must be burned (See Annexure 12.5).

Disposal of Infected materials

Litter and straw, depending on the amount present and the characteristic of the farm, can be either burned or buried in a pit with the carcasses. Contaminated animal feed on the site must be disposed of by burial or incineration.

3.4.3 Decontamination/ Disinfection

All units which are physically or functionally connected to the establishment such as vehicles used for transporting live animals should be decontaminated with appropriate disinfectants; it may be simpler to burn poorly constructed animal housings where there is a danger of *Ornithodoros* ticks. If ticks are absent, spraying with a disinfectant effective against ASF should be sufficient, as the virus does not remain viable for long outside a protein environment. Appropriate disinfectants for ASF include 2 percent sodium hydroxide, phenol substitutes, sodium or calcium hypochlorite (2 – 3 percent available chlorine), potassium peroxymonosulfate + sodium dodecyl benzenesulfonate (Virkon-S®) and iodine compounds.

A detailed guideline for decontamination is given in Annexure 12.6. The duration and the frequency of disinfection must be decided based on the disinfectant used by the team.

3.5 **Awareness and education**

Public awareness and education campaigns are integral elements of any disease prevention, control and elimination strategy. It should be mainly targeted in places where piggery farming is intensive, and communities affected by the disease and ASF control actions. The DoL and BFDA shall jointly coordinate radio and television programmes and carry out advocacy programmes as a means of getting the message across to these people. Meetings are particularly suitable, as there will be community involvement and the opportunity to ask questions and disseminate material such as pamphlets and posters that will reinforce the information.

3.6 Tick control

Elimination of *Ornithodoros* ticks from infected premises is a challenge, particularly when involving old buildings, because of the tick's longevity, endurance, and ability to hide in cracks that cannot be reached by acaricides. The destruction of tick habitat (e.g., covering over cracks where ticks can hide and/or building new facilities with materials that leave no cracks) helps to lower their numbers and transmission potential. Infested buildings should not be used as pigsties. Acaricides and other pesticides may be used on bedding or, depending on the product, applied directly to the skin of pigs. Since blood-sucking insects can mechanically spread the ASF virus within herds, insect-control programmes are advisable on infected premises.

3.7 Wildlife control

No realistic measures can be taken to prevent sylvatic transmission of ASFv. The only option is to implement prevention measures to protect domestic pigs from being infected. In areas where the sylvatic cycle occurs, adequate fencing, or permanent housing of domestic pigs have been demonstrated to provide complete protection. The fencing or wall must extend below the surface for at least 0.5 metres to prevent burrowing by wild pigs and the recommended height is 1.8 metres.

3.8 Human health and safety

Though ASF is not a threat to public health, responders may be exposed to other health hazards. Prevention of adverse human health events related to emergency response efforts is very important, therefore, personal protective equipment should be used always while carrying out various activities in the infected or suspected premises.

3.9 Compensation

The Livestock Act of Bhutan 2001, under sub-section 9.3, clearly states that the government has the authority to compulsorily destroy animals, animal products or feed or other risk goods that it considers to be risky and pays compensation as prescribed by the Ministry of Agriculture and Forests.

Based on the existing compensation protocol prescribed by the Ministry, it is essential that farm owners who have had their pigs slaughtered, pig meat products confiscated, or property destroyed as part of an ASF control programme should be compensated. Compensation should be paid without delay. Under some circumstances, the replacement of stock may be offered in place of monetary compensation.

A compensation mechanism has been incorporated to encourage timely and positive reporting of any cases and to compensate for losses due to disease or culling. The "Guidelines

for compensation mechanism" outlines the management of the compensation fund (See Annexure).

3.10 Destocking

After depopulation, disposal, and decontamination procedures are completed; the farm/premises should be left empty for a period determined by the estimated survival time of the pathogen. As a general rule, this would be shorter in hot climates than in cold or temperate climates. In line with the WOAH, a minimum of 40-day downtime (destocking period) is recommended.

4 RECOVERY STRATEGIES

4.1 Withdrawal of zones declared and bans imposed

The exact date of ban lifting shall be determined by the IOC based on risk assessment findings and compliance to the technical recommendations and advice of the field team.

If the farm sanitary measures and farm biosecurity standards are upgraded as recommended by the IOC and the risk of disease spread has been minimised appreciably, the bans imposed and zones delineated may be lifted 6 weeks after the last day of stamping out.

Dzongkhag or Thromde Administration, on technical recommendation of the IOC following post-outbreak surveillance, should issue an order for lifting the ban on the movement of animals and animal products.

4.2 Restocking/ Repopulation

At the end of the destocking period as recommended by the IOC, pigs may be reintroduced to previously infected farms or villages. Restocking to full capacity should only take place after sentinel pigs have been introduced at approximately 10 percent of the normal stocking rate on each previously infected farm.

These pigs must be observed closely for six weeks (42 days) to ensure they stay free of ASF before full repopulation. However, the observation duration may extend based on the risk assessment by the IOC and technical recommendation of the TWG.

4.3 Surveillance and awareness

After the successful containment programme, regular monitoring through surveillance and awareness programme, along with other preventive measures shall be conducted to eliminate the disease.

5 ORGANIZATIONAL STRUCTURE DURING ASF CONTAINMENT

ASF outbreaks, depending on scale and severity, may be considered a national disaster and therefore, activation of the National Disaster Management Authority (NDMA) chaired by the honourable Prime Minister and members comprising of high-level decision-makers from key sectoral agencies is essential for smooth implementation of NASFPCP. In line with the Disaster Management Act of Bhutan 2013, the NDMA shall be regarded as the highest policy-making body for NASFPCP.

5.1 National Disaster Management Authority

NDMA will facilitate the implementation of the NASFPCP during outbreaks as advised by the National Incident Command Committee (NICC). The NDMA shall be chaired by the Prime Minister and shall include members as stipulated in sections 7 and 8 of Chapter 2 of the Disaster Act 2013. The NDMA will make policy decisions during the pandemic phases.

The NDMA shall seek technical recommendations from experts within MoAL for decision-making processes. The Incident Command Structures have been adopted for proper coordination of the key stakeholders during the containment operation. The incident command structure will allow a smooth flow of information from the national level to the incident area and vice versa.

5.2 National Incident Command Committee

The NICC is the highest technical and policy decision-making body for ASF prevention and containment activities in the country under the guidance of NDMA. The National Centre for Animal Health (NCAH) under the Department of Livestock (DoL) shall be the secretariat for the functioning of the NICC.

Composition of the National Incident Command Committee:

- Secretary, Ministry of Agriculture and Livestock (MoAL) – Chairperson.
- Head, Department of Livestock, MoAL.
- Head, Bhutan Food and Drug Authority , MoH .
- Head, Department of Forests and Park Services, MoENR.
- Head, Royal Bhutan Police (RBP)
- Head, Plant and Animal Biosecurity Division, BFDA.
- Department of Planning, Budget and Performance (DPBP) , MoF
- Head, Department of Disaster Management , MoHA
- Head, Animal Health Division, DoL – Member Secretary.
- Head, National Centre for Animal Health, DoL.
- Dzongdag/ Dungpa/Thrompon (Observer)

Roles of NICC:

- Oversee and guide the implementation of ASF prevention and containment activities.
- Approve containment plan and facilitate resource mobilization.
- Make policy decisions related to the implementation of NASFPCP.
- Endorse recommendations of the technical working group for ASF.
- Enhance coordination among the different stakeholders.

Meeting and Procedures:

- The NICC will be chaired by the Secretary of MoAL.
- The Head of the Department of Livestock shall serve as the member secretary.
- The committee shall meet at least once a year or as and when required.
- The NICC meeting shall be convened within 24 hours of laboratory confirmation of the outbreak by the NCAH.
- The NICC shall authorise the activation of the Technical Working Group (TWG) and establishment of the Incident Operations Centre (IOC) which will spearhead the containment activities of ASF control in the country.

5.3 Technical Working group

A Technical Working Group on ASF (TWG-ASF) comprise experts from DoL and BFDA will advise and provide technical recommendations to the concerned agencies and the NICC and field offices for implementation of NASFPCP.

TWG Members comprise of:

- Animal Health Division, DoL.
- National Centre for Animal Health, DoL.
- Plant and Animal Biosecurity Division, BFDA.
- A representative from DoFPS (when required).
- RLDC/RVH & EC (If DLS lead the IOC operation).

Roles & Responsibilities:

- To evaluate the technical activities of ASF prevention and containment activities using the ASF assessment tool.
- To recommend solutions for technical issues/ challenges faced during the field implementation of NASFPCP.
- To review ASF containment budget proposal and submit to NICC for approval and mobilize the release of budget from MoF.
- To review and develop guidelines, SOPs, IEC related to ASF prevention and control.
- To develop training materials and provide training to DoL and BFDA officials.
- To conduct analysis, prepare and share the ASF report to relevant key stakeholders.
- To identify research needs and facilitate research related to ASF.

- To review and propose amendments on regulations related to ASF control and elimination.
- To prepare a dossier for validation and for acquiring freedom from ASF infection following the stepwise approach for ASF control and elimination.
- The TWG meeting shall be convened as and when required to review the NASFPCP and provide recommendations to the NICC/ DoL.

5.4 Incident Operation Centre

The IOC is the field level coordination and implementation unit for rapid response and control measures. The unit will be responsible for providing field level information and updates on the disease status, progress on the response, and control activities to the NICC through the TWG for ASF. Besides, it will ensure that all policy decisions and directives for response and control activities are conveyed to the different RRTs. The IOC shall submit daily updates including the minutes of the meeting to the TWG and NICC about the status of the ASF outbreak and containment activities. Depending on the level of outbreak; the NICC will decide and direct the activation of IOC.

In case of simultaneous outbreaks beyond the reach of the one IOC in the same region, a second IOC shall be established with members consisting of officials from veterinarians and veterinary paraprofessionals from the region and dzongkhags. The TWG shall facilitate mobilization of human resources to operate the IOC(s).

Team composition: The composition of the Incident Command Committee is as follows:

Sl. No.	Member	Agency	Main Tasks
1	Regional Director/ Head of Animal Health Section under RLDC RVO, RVH & EC/ VO, DVH	Concerned RLDC, RVH & EC, or DLS	Incident Commander/ overall coordination including reporting to higher authorities
2	Regulatory and Quarantine Officer (Livestock)	Concerned PLQO / Dzongkhag BFDA	Deputy Incident Commander - Assist Incident Commander
3	Veterinary Epidemiologist/ VO	RLDC/ RVH&EC/ DVH	Investigation/ Epidemiological Surveillance
4	Veterinary Officer	RLDC/RVH & EC/ DVH	Clinical and laboratory Surveillance

5	Regulatory and Quarantine Officer/ RQI	Concerned BFDA Office	Oversee enforcement of quarantine and movement control
6	Regulatory and Quarantine Officer/ RQI	Concerned BFDA Office	Oversee depopulation, decontamination, and disposal measures and disposal (3D)
7	Dzongkhag Livestock Officer / Concerned Gewog extension staff	Concerned Dzongkhag	Logistic support/ risk communication/ Member Secretary for the Compensation Committee
8	Gup/ Thrizin	Concerned Gewog(s)	Gewog level logistic support
9	SP or OC or representative	RBP of the concerned Dzongkhag	Law and Order
	Dzongkhag disaster management focal	Concerned dzongkhag	Coordinate between IOC and local government in the implementation of IOC activities.
11	Forest and Park Official	Concerned division/Park	Coordinate disease surveillance & control in wildlife

The HR composition of IOC may vary based on the disease outbreak scale and level of intervention required. The TWG shall consult with the IOC to assess the need and facilitate mobilization for implementation of RRT-specific activities.

Role of Incident Commander (Livestock)

- Overall coordinator of ASF containment activities at field level.
- Supervise and monitor the activities of different RRTs on a daily basis.
- Conduct and chair IOC meetings on a daily basis.
- Keep NICC, TWG and relevant agencies updated on the progress of IOC.
- Submit the issues raised by the RRTs with the proposal of recommendations to the TWG/ NICC.
- Facilitate and mobilize all logistics and supplies required to RRTs.
- Liaison with relevant agencies within the Region/ Dzongkhag/ Dungkhag/ Thromde/ Gewog level.
- Submit budget proposals to NICC via TWG and settle all the bills.

- Fully responsible and accountable for expenditures incurred during the containment of ASF outbreak and auditing of the expenditures.
- Upscaling and downscaling of manpower based on the burden of the outbreak.
- Conduct stakeholder consultation meeting in the field.

Role of Deputy Incident Commander (BFDA)

- Assist Incident Commander in implementation of ASF outbreak containment activities in the field.
- Coordinate risk communication activities with Team Leaders of RRT.
- Overall coordinator of 3-D operation, Movement Control and Quarantine.
- Maintain daily records of all IOC and RRT activities and prepare minutes of the meeting on a daily basis.
- Daily field monitoring and supervision of containment activities.
- Any other task assigned by the Incident Commander.

5.5 Rapid Response Teams

RRTs comprise mainly of technical officials responsible implementing various field activities for the control of ASF outbreaks as prescribed in the NASFPCP and as directed by the IOC Incident Commander.

The team composition and key roles are described in the following, however, based on the disease outbreak scale and severity, the team composition may vary.

5.5.1 Disease Outbreak Investigation Team (DOIT)

The DOIT shall be responsible for disease outbreak investigation, sample referral and outbreak confirmation. They shall be responsible for assessment of risk for further spread of the disease. Based on outbreak investigation and risk assessment, zonation and other response measures shall be determined and implemented. The disease outbreak investigation activities are outlined in Annexure 13.1.

5.5.2 Surveillance Team

The surveillance team (clean team) shall be involved in carrying out all necessary surveillance activities in the demarcated protection zone (See Annexure 13.2).

The team will also provide risk communication on ASF to the communities and give assurance to the public.

5.5.3 3-D Team (Depopulation, Disposal, Decontamination)

The 3-D team shall be responsible for carrying out culling of infected and suspected pigs, their disposal, and decontamination of the premises assessed to be contaminated or potentially contaminated with ASFv (Annexure 13.5).

5.5.4 Quarantine and Movement Control Team

BFDA shall implement quarantine and movement control for live pigs and pork products as per the SOP for quarantine and movement control (See Annexure 13.4).

5.5.5 Law and Order Team

The main role and responsibilities of the law-and-order team are to ensure compliance and smooth operation of all disease control measures implemented through RRTs. The team shall support all technical RRTs involved in the disease control measures.

5.5.6 Logistic Team

The main role and responsibilities of the logistic team are to ensure that all necessary logistical facilities such as PPE, food and refreshments and transportation are made available to all RRT members for smooth implementation of ASF outbreak response measures.

The Logistic Team shall be composed of the following members:

- Incident Commander.
- Concerned PLQO/ Dzongkhag BFDA Office.
- Procurement Officer/ Administrative Officer/ Accounts Officer, RLDC/ RVH & EC.
- Dzongkhag Livestock Officer/ Gewog Livestock Supervisor.

5.5.7 Compensation Committee

The main role and responsibilities of the Compensation Committee are to ensure the provision of compensation in a fair, transparent, and timely manner to all eligible owners/ farmers. The committee shall strictly adhere to compensation guidelines given in Annexure 13.10.

The Compensation Committee shall be composed of the following members:

- The Dzongdag/ Dungpa/ Thrompon representative as the chairman.
- Dzongkhag Livestock Officer /Incident Commander/ Gewog Extension staff– Member Secretary.
- The Dzongkhag Disaster Management Officer.
- The Gup or the Mangmi of the Gewog or a representative – Member.
- BFDA Livestock Inspector in the Dzongkhag/ PLQO – Member.
- A representative from the DoL – Member.
- Thromde Thuemi (in Thromde areas).

5.6 Role of Relevant Agencies/ Organizations

5.6.1 Department of Livestock

The Animal Health Division (AHD) of the Department of Livestock shall oversee policy formulation related to NASFPCP in the country. The specific roles include the following:

- Oversee the implementation of the ASF prevention and control programme in the country.
- Mobilize resources including a fund for the ASF control programme in the country.
- Collaborate with BFDA to enable better enforcement of the Livestock Acts and By-laws of the country.
- Collaborate with relevant national/international agencies for ensuring and mobilization of support required for ASF control.
- Coordinate border harmonization meetings with the Indian counterparts at the state and central levels.

National Level

The National Centre for Animal Health shall be the National coordinating centre for all preparedness and response activities on ASF. The NCAH shall provide necessary technical, logistic and financial support to the IOC to enable the IOC to undertake disease control measures effectively. The NCAH shall also work as secretariat to NICC and TWG and facilitate the organization of TWG and NICC meetings as and when instructed by the Chair of NICC and TWG. The NCAH shall be the link between IOC/ RLDC/ RVH&EC and NICC/ TWG and shall provide technical backstopping to the disease control measures implemented by the IOC/ RLDC/ RVH & EC.

The specific responsibilities of the national focal agency are to:

- Coordinate the overall implementation of the ASF prevention and control programme in the country.
- Support the activation of a rapid response team (RRT) in the event of outbreaks.
- Facilitate resource mobilization at the national level.
- Liaise with different stakeholders/agencies for facilitating better implementation and ensuring the success of the prevention and control programme.
- Coordinate the conduct of epidemiological research in collaboration with national, international diagnostic, and research institutions.
- Production of education (IEC) materials and make them available for wider circulation for the advocacy campaign.
- Ensure maintenance of a database on ASF prevention and control programme, analysis, and dissemination of information/progress report to the Department/Ministry/other stakeholders, regarding the progress of the programme.

- Conduct ASF coordination workshops at the national level to review and realign the prevention and control programme.
- Monitor and evaluate the prevention and control programmes implemented by the field units.
- Capacity building of field professionals.
- Declaration of risk zones/compartments for ASF and assess the status of these zones/compartments by regular surveillance and monitoring.
- Regular update of information about ASF outbreaks in neighbouring countries, to all relevant stakeholders.

Regional Level

The Regional Livestock Development Centre/ Regional Veterinary Hospital & Epidemiology Centre shall function as a regional focal agency for the ASF prevention and control programme.

The main roles of the regional focal agency should be to:

- Coordinate the overall implementation of the ASF prevention and control programme at the regional level.
- Coordinate the activation of a rapid response team (RRT).
- Coordinate surveillance programmes for prevention and control of the ASF outbreak.
- Provide support and coordinate logistics arrangement at the regional level.
- Liaise with the BFDA for facilitating enforcement of the Livestock Act and By-laws.
- Monitoring and evaluation of the ASF prevention and control programmes.
- Ensure prompt reporting of suspect cases and updating the disease status in the existing database.
- Ensure maintenance of a database on ASF prevention and control and submit a progress report to the NCAH.
- Ensure activation of Veterinary Vigilance Team when ASF outbreaks are reported in the neighbouring countries.
- Coordinate the cross-border surveillance of ASF in their respective areas.

Satellite Veterinary Laboratory (SVL)

The Satellite Veterinary Laboratory shall play an important role in the prevention and control of ASF in border areas. The main roles are to:

- Coordinate the cross-border surveillance of ASF in their respective areas.
- Support implementation of the ASF control and eradication programme.
- Support RRT in the event of an ASF outbreak.
- Provide support and coordinate logistics arrangement.
- Liaise with the BFDA for facilitating enforcement of the Livestock legislations.

- Ensure prompt reporting of the outbreak and updating the disease status in Veterinary Information System.

Dzongkhag Level

At the Dzongkhag level, the Dzongkhag Veterinary Hospital would function as the focal agency for the implementation of the ASF prevention and control programme. The Dzongkhag should carry out the following tasks:

- Implement NASFPCP activities in the field.
- Support the activation of a rapid response team (RRT) in the event of case detection or outbreak.
- Ensure prompt reporting of the outbreak and updating the disease status in Veterinary Information System.
- Arrange logistics at the Dzongkhag level and assist the Gewog staff with their logistics.
- Liaise with the BFDA at the Dzongkhag level for facilitating better enforcement of the Livestock Acts and By-laws.
- Coordinate regular disease awareness campaigns for the farmers and other relevant stakeholders in the Dzongkhag
- Coordinate to implement the farm biosecurity standards.
- Liaise with BFDA for farm biosecurity enforcement.
- Risk communication at Dzongkhag level.

Gewog Level

The Livestock Extension Centre/RNR Extension Centre in the Gewog should be the focal agency for that Gewog. They would play a very crucial role in the implementation of the ASF prevention and control programme in their respective gewogs.

The main roles of the Gewog focal agency are as follows:

- Implement the ASF prevention and control programme in the field as per the plan.
- Identify suspected ASF cases and report to the Dzongkhag.
- Support RRT activities.
- Liaise with the BFDA at the Gewog level for facilitating better enforcement of the Livestock Act and By-laws.
- Liaise with the Gewog administration and farmers for facilitating the proper implementation of the programme in the field.
- Conduct regular disease awareness campaigns for the farmers and other relevant stakeholders in the Gewog.
- Risk communication at Gewog level.

5.6.2 Bhutan Food and Drug Authority (BFDA) shall be responsible for/to:

- Enforcement of Livestock Act of Bhutan and Livestock Rules and Regulations.

- Enforcement of movement ban of pig and pork products in and out of the suspected/ affected areas.
- Lead 3-D operations and implement movement control and quarantine measures during outbreak responses.
- Quarantining of infected animals in the affected areas.
- Enforce farm biosecurity standards prescribed by the Ministry of Agriculture and Livestock.
- Activate Border Vigilance Teams during ASF outbreaks in the neighbouring countries.
- Liaise with Integrated Check Posts to enforce the movement restriction of live pigs and pork products.

5.6.3 Other stakeholders

Department of Forests and Park Services

A collaboration between DoL and DoFPS is important for disease surveillance, sharing of suspected disease outbreak information, and prevention and control programmes. Both passive, during peace period, and active surveillance, during outbreak phase, must be conducted by the forestry officials, and any report of pig die-offs must be reported immediately to the nearest livestock extension centre.

Dzongkhag Administration

The Dzongkhag, Dungkhag, and Gewog administration support are important for coordinating ASF prevention and control activities including rapid containment of ASF outbreak in their areas. Local government support is crucial for strict implementation at the village and community level.

Ministry of Home Affairs

The ministry shall support, coordinate, and manage activities as per the National Disaster Management Act 2013. The DDM shall facilitate and support the timely release of funds for the implementation of response activities in the event of an outbreak of ASF.

The Royal Bhutan Police support shall be sought if necessary, during the implementation of control measures for containment of ASF outbreak in the field.

The Royal Bhutan Police at ICPs to inspect the porks and its products (at port of entry) and inform BFDA accordingly

Ministry of Finance

The Ministry of Finance (MoF) shall provide adequate funds for the implementation of NASFPCP in the country upon recommendations of NICC.

The Department of Revenue and Customs under the ministry shall support BFDA in the examination and inspection of imported livestock and livestock products including other risk goods to ensure their safety in the event of an outbreak of ASF.

Local Government Administration

The Dzongkhag, Thromde, Dungkhag and Gewog administration should support coordinating ASF prevention and control activities within their respective jurisdictions.

International Organizations

Linkages with international organizations such as the Food and Agriculture Organization (FAO), World Organization for Animal Health and other partner organizations must be built for seeking technical and fund support, particularly, human resource and laboratory capacity development and referring of samples for laboratory diagnostic purposes, including molecular characterization of the virus.

6 SUPPORT PLANS

Support plans for better coordination and containment of the ASF outbreak require lots of resources both in terms of financial and human resources with strong policy support and legislation.

6.1 Financial Plan

Experience has shown that delay in obtaining finances is a major constraint to rapid response to any disease outbreaks in the field. Immediate application of even modest funds can save major expenditure later. Forward financial planning is, therefore, an essential component of preparedness.

The fund mobilization for the preparedness and response activities against ASF will be undertaken as per provisions of the Disaster Management Act of Bhutan 2013. During normal situations, the concerned agencies (DoL and BFDA) will propose a budget during the annual budgeting exercise for prevention activities such as awareness, disease surveillance, and capacity building activities of relevant stakeholders.

However, in the event of an outbreak, financial plans need to be developed to provide an immediate provision of contingency funds to respond to disease emergencies. These are for expenditure required over and above normal operating costs for the concerned agencies. Plans and budget should be approved by NICC after review for an immediate disease containment activity as per the provisions of the Disaster Management Act of Bhutan 2013. The concerned agencies (DoL & BFDA) will then propose reimbursement of funds through the IOC to the NICC for review and approval of the budget and activities. The NICC will forward the budget requisition to the MoF for final approval and sanction. The MoF shall release the approved budget to the IOC through the concerned RLDCs/RVH & ECs/DLS.

The budget may cover the cost of the whole disease elimination programme as detailed out in Annexure 13.13. They usually cover the initial phases of the containment, review of the outbreak, and the control programme and funds required to finalize the disease elimination programme.

The DoL and BFDA may identify potential international donors, including emergency support from OIE/FAO or other international agencies to support disease prevention and elimination programme.

6.2 Legislation

The plan is in line with Livestock Act 2001 Chapter IV, Section 9, wherein, the powers to carry out ASF response actions are authorized to:

- Seal and claim the infected areas and disease-control zones.

- Quarantine farms or other livestock enterprises.
- Ban movements of pig and pig products or potentially contaminated materials.
- Destruction and safe disposal of infected or potentially infected animals and contaminated products and materials, subject to fair compensation.

6.3 Research and Extension

The proper study shall be carried out on the following relevant subjects which would benefit in preparing for prevention and control of ASF outbreak in the country and reviewing the present document:

- Pork value chain system in the country.
- Biosecurity of piggery farms in the country.
- Geographical distribution of wild boars.
- Pig management system in the country.
- Prevalence and distribution of the ASFv vector in the country.
- Cross-border movement of live pigs and pork.
- Other risk factors for ASF disease in the country.
- Pig population dynamics in the country.

7 CAPACITY BUILDING

7.1 Training

Staff should be trained in their roles, duties, and responsibilities in an ASF disease outbreak response and enhance their knowledge. The training can be provided in-country through hands-on training in laboratory diagnosis, surveillance, and other control strategies. Further, some training can also be availed through the support of OIE/FAO and liaising with regional and international ASF epi-network aimed at enhancing the capacity of staff and relevant stakeholders.

7.2 Simulation Exercises

The NCAH shall lead in validating and testing NASFPCP through desktop simulation exercises by simulating a real-time disease outbreak scenario, or a drill to test the whole document or important components such as response actions during outbreaks. This provides valuable means for building teams for disease outbreak responses and for training individual staff.

After each simulation exercise and training, there should be an assessment of the results. This review should identify areas where plans need to be modified and further training required.

8 MONITORING AND EVALUATION

This strategic plan should not be treated as static but as a document that regularly needs reviewing and updating to reflect changing circumstances. The NASFPCP implementation shall be reviewed and validated by the M&E team at the national, regional, and dzongkhag level.

A team comprising officials from DoL and NCAH shall oversee the overall implementation of the NASFPCP. Preparedness and response to ASF outbreak(s) by relevant stakeholders at dzongkhag and regional levels shall be evaluated by respective RLDCs.

M&E must be done at the time of disease outbreak and peace time to see how well the plan works. The M&E team should provide recommendations and feedback for further improvement of the disease response and preparedness plan.

9 ANNEXURE

9.1 Guideline for ASF outbreak investigation.

This outlines the general principles and steps for the investigation of the ASF outbreak in the field.

Team composition

- Veterinary epidemiologist and/or Regional Veterinary Officer (Team leader).
- Veterinary pathologist.
- Laboratory technician.
- Dzongkhag veterinary officers.
- Field veterinary paraprofessionals.
- BFDA A officials.

Steps for Investigation

- Pre-investigation preparation.
    - Includes briefing each person's roles and responsibilities and packaging necessary materials required in the field.
- Gather preliminary information.
    - Collect necessary information like outbreak details and inform about the team's visit to the area.k
- Field investigation - Includes a collection of detailed information about the outbreak, suspected source, prevalence of disease vector, and collection of geo-coordinates. The following information should also be collected:
    - Baseline mortality and clinical signs - General information about affected and at-risk population, daily morbidity and mortality and detailed clinical signs and symptoms.
    - Bio-security arrangements - Describe the bio-security arrangement of the farm e.g., disinfectant foot wash, perimeter wall/fence, and wild pig control, etc.
    - Feed source - Describe feed sources and assess visually for the possibility of wild pig accessibility.
    - Water source - Assess water source for the possibility of wild pig contamination.
    - Wild pigs - Determine the presence of wild pigs in the area.
    - Scavenging pig - Determine the presence of scavenging pigs in the area
- Laboratory investigation.
    - Includes a collection of samples from both affected (sick and dead) and non-affected population, environment suspected to have contaminated, packaging, and transportation to the laboratory.

- Characterize the outbreak - Establish or verify the outbreak and describe in terms of time and space.
- Develop a hypothesis.
- Implement prevention and control strategies.
- Communicate the findings.

9.2 Guideline for ASF surveillance

Introduction

Strong surveillance systems are essential to provide decision-makers with quality and timely information on the status of animal diseases in a country, enabling them to develop effective disease control programmes and respond rapidly to emerging threats to livestock and public health.

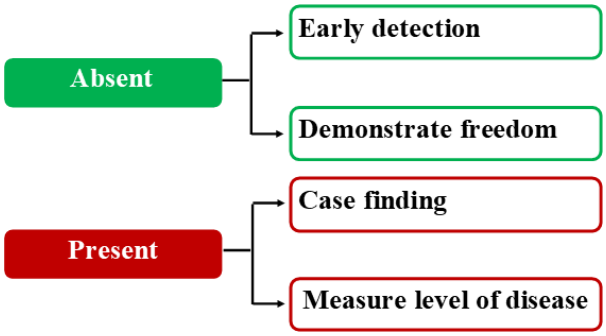
The NCAH, in collaboration with relevant stakeholders, has developed this guideline to support veterinary services in designing comprehensive animal disease surveillance plans by highlighting some of the most important components. The ASF surveillance guideline should be tested, approved and actively communicated and disseminated to all stakeholders of the surveillance system within the country. National Centre for Animal Health, the steering and/or technical body in charge of national animal health surveillance, should review and update this guideline regularly to ensure their effectiveness and relevance to the purpose.

ASF surveillance implementation plan in the field shall be developed in alignment with this guideline.

Purposes

There are many reasons why veterinary authorities undertake surveillance activities, but these can be summarised into four general purposes:

- Demonstrating freedom from disease.
- Early detection of disease.
- Measuring the level of disease.
- Finding cases of the disease.

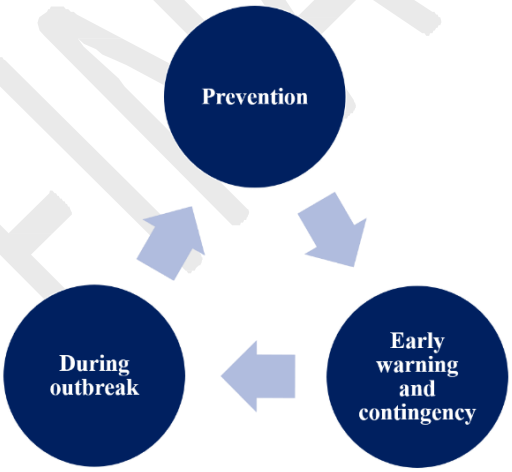


Materials and equipment

- Data recording sheet.
- Notepad and pen.
- Mobility.
- Mobile phones.
- Sampling kits.
- Field diagnostic kits.
- Extension gears.

A. Phases of surveillance

The timeline for the implementation of different types of surveillance activities in the field is dependent on the current situation of ASF outbreaks in the country and the region. ASF surveillance shall be conducted during three different phases: prevention, early warning and contingency, and during the outbreak(s).



I. During Prevention Phase

During peacetime, the regional centres and dzongkhag livestock sectors shall regularly report pig morbidity and mortality cases from their respective jurisdictions to the National Centre

for Animal Health (NCAH). Livestock field officials shall liaise with Forest and Park officials for reporting morbidity and mortality in wild pigs.

Passive farmer disease reporting systems are the best tool for early detection because they have comprehensive coverage of the population and are continuous.

Target users

- Veterinary Officers – RVH & EC/RLDCs.
- Veterinary Officer and Veterinary Paraprofessionals – DLS.
- Concerned officials – DoFPS .

Activities

- Passive syndromic surveillance shall be conducted on a daily basis in their respective jurisdictions.
- Any suspected ASF case(s) must be reported by the LEC/ DVH to the concerned RVH & EC/RLDC and NCAH through the flash report in VIS or other fastest means of communication.
- Information on unusual wild pig die-offs must be shared by DoFPS field offices to the nearest animal health centres.

II. Early warning and contingency phase

Upon the confirmation of the ASF outbreak in neighbouring countries and unusual pig mortality reports from passive surveillance, early warning and contingency surveillance activities shall be conducted. Based on the risk assessment for the incursion of ASFv into the country, areas shall be identified for the implementation of heightened surveillance through activation of the Border Vigilance Team and Veterinary Vigilance team.

Border Vigilance Team (BVT)

Team composition

- OIC/ RQO-Livestock of concerned PLQO/ Dzongkhag BFDA office.
- Livestock Regulatory and Quarantine Inspectors.
- Temporary recruits.

Activities

- Keep strict vigilance at the point of entries to curb illegal movements of pig and their products. Effective targeted surveillance at commercial and government piggery farms including backyard farms.
- BFDA in collaboration with ICPs to enforce the movement restriction of pigs & its products
- Strictly monitor and regulate the bio-security practices in the commercial & backyard farms in the high-risk areas.

- Collect samples from intercepted and quarantined pigs that are suspected of ASF and submit them for testing at referral laboratories.

Veterinary Vigilance Team (VVT)

Team composition

- Veterinary Officers from DVH/ RVH-EC/RLDC/ NCAH.
- Laboratory technicians from NCAH/ RLDC/ RVH-EC/SVL/ DVH.
- Veterinary paraprofessionals – DLS/RNR-EC/LEC.
- Concerned officials – DoFPS.

Activities

- Keep vigilance on any ASF outbreak-related events in the immediate border areas and report to DoL, NCAH, BFDA and other stakeholders.
- Awareness on disease to the targeted population (high risk villages)
- Identify local leaders/ relevant person as the focal point to report any suspicious cases at the village level to any VVT member.
- Carry out surveillance in wild pigs in collaboration with DoFPS.
- Submit an immediate report to the NCAH and DoL of any suspicious case.
- Submit weekly report to the DoL, HQ and NCAH.
- Submit or make weekly briefing to the concerned Dzongdags.

III. During outbreak phase

The Disease outbreak investigation team, based on risk assessments, shall delineate infection and protection zones. These zones shall determine the surveillance activities to be implemented. The protection zone may include the farm within the infection zone with the practice of high-level farm biosecurity and other ASF prevention measures. Active surveillance shall be conducted in the protection zone.

Team composition

- Veterinary officers or epidemiologists and Lab technicians – NCAH.
- Veterinary officers or epidemiologists and Lab technicians – RVH & EC/RLDCs.
- Veterinary Officer and VPPs – DLS.

Activities

- Active clinical and laboratory, virological and serological, surveillance should be conducted in the protection zone: for clinical surveillance, refer to clinical signs and lesions and case definition parts of the National ASF Prevention and Control Plan and for

laboratory surveillance, refer to the SOP for laboratory sample collection for diagnosis of ASF.

- Survey methodology and sample size shall be determined by the RRTs based on the disease risk assessment.
- Surveillance report must be submitted to the NCAH and AHD, DoL on daily basis.
- The surveillance programme should be carried out until 6 weeks from the last detected case of the outbreak.

B. Data collection

During the peace period, suspected ASF case(s) or outbreak(s) must be reported with the details as per the flash report format. Refer to the laboratory sample submission form to gather information required during laboratory surveillance.

For clinical surveillance, the following data items must be recorded:

Particulars	**Information**
Date	
Owner details	
Locality	
Geo Coordinates (Lat., Long.)	
Breed	
Farming system	
No. of cases (with age and sex)	
Date of first case	
No. of deaths (with age and sex)	
No. of animals at risk (with age and sex)	
History (introduction of new pigs - from where and when)	

History (Sale of pigs - to where and when)	
Clinical signs	
Post-mortem lesions observed	
Sample details (if any)	
Actions taken	
Reporting Officer	

9.3 Biosecurity procedures to be followed when visiting the infected farms.

Equipment needed to ensure good biosecurity when entering a farm:

- One pair of good-quality gumboots that are easy to clean and disinfect.
- Disposable coverall.
- Boot covers.
- Hand gloves (make sure they are the right size).
- Plastic mat.
- Buckets.
- Appropriate detergent.
- Disinfectant (approved for ASFV).
- Scrubbing brushes (two).
- Biohazard bags (including biohazard bags).
- Ziplock bags (for transporting phones or other equipment).
- Disinfectant wipes for the face.
- Water (1-litre minimum).
- Sealing tape.
- Scissors.
- Sampling and recording equipment.

Before departing:

- Remove all unnecessary equipment from the car.
- Make sure you bring all the necessary equipment with you.

On arrival:

- The car should not be driven onto the premises (leave it near the farm entrance).
- Choose a suitable location for your disinfection site on a clean and dry surface (preferably concrete), using a clear demarcation between the clean and dirty sides (the gate usually).
- Remove all unnecessary clothes and items (e.g., jacket, tie, watch) and empty your pockets.
- Electronic equipment (e.g., mobile phones) needed on the farm should be placed in sealed plastic bags to facilitate subsequent cleaning and disinfection.
- The phone should never be removed from bags while on the farm and should only be used through the plastic bag.
- Remove from the car all the items needed for disinfection that are to be taken onto the farm.
- Lay down a plastic sheet on the clean side of the disinfection site.
- Place the items you will be taking with you to the farm on the dirty side of the disinfection site (e.g., black plastic bags and sample container).
- Don the PPE.

On leaving the farm:

- Doffing of the PPE should be done at the dirty site.
- Before leaving the premises, use the farm's facilities to clean very dirty areas.
- Wash off and disinfect the bag containing the phone and any similar items taken to the farm.
- Remove boot covers and dispose of in dirty-side plastic bags including used PPE.
- Lastly, hands and glasses should also be disinfected here, as well as your face with disinfectant wipes.
- Non-disposable equipment and samples should be double-bagged and taped shut.
- Regular shoes can be put back on.
- Any equipment and materials from the farm must stay on the dirty side.
- Leave the farm and immediately take samples/equipment for processing.
- If there are no pigs on your premises you may return home, shower, and thoroughly wash your hair.
- All clothes worn that day should be soaked in disinfectant for 30 minutes and washed with water over 60 °C.
- Alongside the procedures for cleaning and disinfecting yourself, you may also need to clean and disinfect the car.

9.4 Standard Operating Procedure (SOP) for quarantine and movement control

Purpose

The purpose of this SOP is to ensure that the implementation of quarantine and movement control measures in protection zones are carried out smoothly, effectively and successfully to prevent and minimize the spread of the ASF virus from infected areas.

This will not apply to routine movement monitoring at other entry and strategic check posts.

Target/User: Quarantine and movement control team

Team composition

- Team leader: Regulatory and Quarantine Inspector/ Officer (Livestock).
- Technical Assistant: BAFRA Livestock Inspectors (number to be determined based on the place and size of outbreaks and entry and exit points in the infected and protected zones).
- Record keepers: BFDA Livestock Inspector (one each in all entry and exit points of the infected and protected zone).
- One police personnel.

Disinfectants

Each quarantine and movement control team should be provided with an adequate quantity of the following disinfectants and accessories:

- Soaps and Dettol.
- Sodium hypochlorite or a 5 kg container of Virkon for vehicles and machinery.
- Petrol, Kerosene and other lubricants.

Equipment

- Power sprayer (3000 PSI) used to dispense Virkon®S or other disinfectants.
- Hoses (5 meters).
- Continuous water supply and water storage tank (500 litres).
- Barrier/security line tape
- 1 roll duct tape.
- Foot bath with tray and mat.
- A large bucket that can hold approximately 20 litres of water.
- Heavy-duty trash bags.
- Small plastic bags.
- Clipboard, notebook and pen.

Personal cleaning and disinfection supplies

- Scrub brushes for removing dirt and other particles before using disinfectants.
- Soap to wash hands and face.
-
- Biohazard control materials

- Alcohol cotton pads, 70% ethanol – these are generally used to wipe your hands after removing your PPE.
- Red biohazard bags for placing used PPE.
- First aid kit.
- Flashlight.

Procedures

- Determine all possible entry and exit points around the periphery of infected and protection zones based on the map of disease outbreak zones declared by the Incident Operation Centre on the recommendation of the disease investigation team.
- Establish only one or two entry and exit points from the infected and protection zone and seal all other entry and exit points.
- Place appropriate signboards to inform the public about the movement control measures in place.
- The movement of live pigs, their products and related items such as feed and equipment must be prohibited and quarantined until six weeks from the date of the last case.
- The vehicle and people coming out of the infected zones must be disinfected thoroughly using appropriate disinfectants.
- All personnel involved in disease investigation, stamping out, decontamination operation must follow complete protocols for entry and exit from these zones as described in the respective SOPs.
- The use of foot dip in the main entry and exit point in the infected areas should be placed and changed daily.
- The PPE coming out of the infected zone must be either buried or incinerated.
- All quarantine and movement control measures shall be lifted upon the recommended duration of the cooling period following the end of the outbreak.
- The record on the movement of vehicle and people must be maintained.
- Identify and establish a proper site outside and close to the periphery of infected and protection zones for putting on PPE, and unloading materials and equipment required for enforcing movement control measures.

Steps to be followed for exiting the quarantine and movement control duty:

- The team members should remove PPE and place them in trash bags, which are to be placed in biohazard plastic bags before exiting the area.
- By the end of each workday, the team members shall dump all the used PPE, other potentially infectious materials including those seized ones.
- All shall disinfect shoes, thoroughly wash hands at the wash station and sanitize your hands.
- All tools and other equipment used shall be cleaned and disinfected at the end of the day's operation.
- All personnel must disinfect their feet by dipping them in the footbath before leaving the place.
- Similarly, all parts of vehicles (especially tyres) must be disinfected at culling and decontamination lines.

9.5 SOP for Culling and Disposal

Purpose

This SOP is to ensure that the implementation of culling and disposal for the control of ASF outbreak is carried out smoothly, successfully within the shortest possible time, and re-establish Bhutan's ASF-free status.

The stamping-out method of the disease control strategy is to be adopted for the ASF outbreak as it the recommended and most effective control method for elimination. This control measure needs to be accompanied by decontamination of infectious materials, proper surveillance, enhanced biosecurity measures, strict quarantine, and restriction of movement of pigs and risk possessing goods.

Scope

This SOP covers the guidelines and steps for humane culling and safe disposal of pigs (dead and slaughtered), pig products, feeds, litters, dismountable sheds, and other infected materials of the culling and disposal team.

Target/User: Culling and Disposal Team

Composition of the team:

- Team leader: Regulatory and Quarantine Inspector/ Officer (Livestock)
- Technical Assistant: BFDA Livestock Inspectors (one in each culling group as animal welfare inspector)
- Record keeper: Concerned Livestock Extension Agents
- Cullers: Hired and trained personnel for depopulation (in each culling group).
- Pig catchers (hire 2 in each culling group).
- Disposal labourers: 2-3 hired and trained labourers for disposal in each culling group.
- Labourer for digging burial pit: 5 labourers at each disposal site. When a large number of pigs are culled, excavating machine may be hired.
- For culling scavenging pig, an expert in darting is required.

Materials and Equipment Required

? *Personal Protective Equipment*

Each culling member must be provided with Personal Protective Equipment (PPE) which includes:

- A coverall (with hood and boots).
- Face mask.
- Goggles.

- Outer glove – (Nitrile).
- Inner gloves – (Vinyl).
- Shoe covers.
- A plastic apron.
- Utility gloves for the pigsty dismantling and cullers.

Each person should be provided with an adequate number of PPE sets depending upon the area of operation and geographical terrain. These items should be always worn when they are in infected or suspected premises.

? *Disinfectants*

Each culling group should be provided with each set of the following disinfectants:

- Adequate quantity of disinfectants.
- Sanitary cloth, disinfectant wipes, or antiseptic wash.

? *Personal cleaning and disinfection supplies*

- Scrub brushes for removing dirt and other particles before using disinfectants.
- Sprayers (10 litres capacity) for dispensing disinfectant solution.
- Soap to wash hands, legs and face.
- A plastic basin for footbaths.
- A large bucket to mix the disinfectants.

? *Biohazard control materials*

- Alcohol cotton-pads, 70% ethanol – to wipe hands after removing PPE.
- A red biohazard bag for collecting used PPE.
- Antiseptic wipes/sanitizer.
- Eyewash.
- First aid kit.
- Flashlight.

? *Culling equipment*

Each culling group should have the following set of equipment:

- Heavy-duty trash bags.
- Small plastic bags.
- Roll of paper towels.
- Clipboard, notebook and pen.
- Duct tapes.
- Restraining and euthanizing equipment (dart gun and accessories, tranquillizing drugs, captive bolt)

? *Disposal materials and equipment*

The following general equipment and supplies are required:

- Spades, crowbars, pickaxes and shovels.
- Sodium or calcium hypochlorite (2 – 3 percent available chlorine).
- Waste containers bags.
- Rolls of black plastic.
- Heavy-duty trash bags.
- Small plastic bags
- Rolls of duct tape.
- Roll of paper towels.
- Ziplock bags.
- Fire extinguisher – portable.
- Barrier tape.
- Excavator – in case of culling of the larger population of pigs.

A. Culling

General consideration

All domestic, stray or wild pigs in the infected premises will be subjected to stamping out once a clinical disease or evidence of active ASF virus infection is confirmed. Culling of wild pigs should be carried out in consultation and collaboration with the Department of Forests and Park Services. The plan for culling should be established based on the information and situation of the infected premises by the team leader.

Make sure that the area chosen for culling is not in the view of neighbours or other crowds, and that only individuals involved in culling operations are in the area. Clearing the culling area of unnecessary bystanders not only makes the process more efficient but also limits the number of people exposed to carcasses and potentially contaminated equipment or surface areas.

Identify and establish a proper site outside and close to the periphery of the culling and decontamination line, for putting on PPE and unloading materials and equipment required for culling and decontamination. Where the infected area is accessible by road, a culling and disposal crew vehicle shall be parked at this site.

Before entering the infected premises:

- Assemble the team and organize into groups as per the specific tasks to be performed in an orderly manner and distribute the materials and equipment to each member.
- The Team Leader shall then provide a necessary briefing to all culling and disposal groups.

- Put on PPE before crossing the culling, cleaning, and disinfection line (protected zone).
- The culling team shall be divided into groups – the first group should start culling in the infected farms/area and other groups shall start culling from the periphery of protected zones and move towards the centre of the infected area.
- Once personnel have entered premises, they may not cross back over the culling and decontamination line for any reason without removing and properly disposing of all PPE and proper personal disinfection.
- Groups identified for culling the infected farms shall only come out after completing the culling and disposal.
- In the infected premises, it is preferable to cull the infected pigs first followed by pigs in contact with infected pigs.

Culling Method

Euthanasia should take place in such a way as to minimize an animal's pain and stress. To meet this requirement, the animal should be rendered unconscious as quickly as possible. Essential to the fulfilment of this objective is the careful selection of the quickest, most humane euthanasia methods, and skilful use of these methods on the part of the culling team. Euthanasia should be performed under the close supervision of a veterinarian, and each animal should be checked after the procedure to ensure that death has occurred.

To cull pigs during ASF control, pigs should be sufficiently sedated using sedatives either by injection or dart gun before the captive bolt is used for euthanasia. Death is confirmed by the absence of a corneal reflex, failure to detect respiration and absence of a heartbeat for more than 5 minutes.

For the depopulation of wild or feral pigs, an appropriate and practical culling method should be adopted in close consultation with concerned authorities.

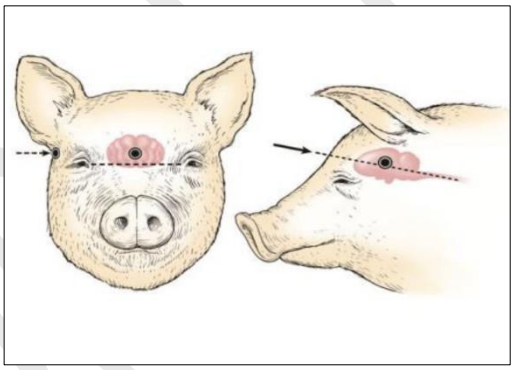
Handling Considerations

Decreasing stress and excitement during movement and handling will ultimately increase swine welfare as well as human safety and efficiency. From a practical handling point of view, as well as a humane consideration, swine must not be forced to travel faster than normal walking speed. Swine should be handled as quietly as possible on non-slip surfaces; shouting and screaming should be discouraged. Besides, the animals must be restrained in a manner that does not elicit injury or undue pain. Animals that are handled roughly or hurriedly will become excited, making further handling unnecessarily difficult. As a humane consideration, and if human safety will not be compromised, non-ambulatory or disabled animals should be euthanized where they are and moved to the disposal site after death. Euthanasia must be performed by competent personnel trained and experienced in the swine euthanasia method.

Penetrating Captive Bolt

Euthanasia of swine utilizing a penetrating captive bolt is both humane and efficient. Animals must be properly restrained to minimize the potential for improper stunning or human injury. For suckling and younger nursing pigs, they can be restrained by firmly and securely holding them, using a body sling, or lifting them using two points of contact (such as one hand on their leg and one on their flank). Larger pigs can be restrained using specific restraining systems such as snaring individually or tranquilising the pigs.

Aiming the Penetrating Captive Bolt



It is essential to aim the penetrating captive bolt correctly. For pigs weighing less than 130 kilograms, the penetrating captive bolt should be placed firmly against the skull and directed at the midline of the forehead and half an inch above the eyes, which is even with the eyebrows. Aim the bolt at the brain and direct the bolt toward the tail. To accommodate the thicker skull structure of more mature pigs, the targeted point of entry should be adjusted to about an inch above the eyebrow line. It should also be moved just slightly to one side or the other of the skull ridge. If time permits, it is advisable to draw landmarks to increase the efficacy of placement, as illustrated at right. There are significant differences between the skulls of growing and adult swine; therefore, it is important to use an appropriately sized bolt to ensure penetration for larger sows and boars. There are also breed differences that may make proper placement more challenging. Different charges are required depending on bolt length. For example, in sows and boars, the distance to the brain is often 4 inches from the surface; therefore, the charge must be sufficiently large to cause the appropriate length bolt to penetrate the skull of a mature animal. To determine the specific charge, personnel should refer to the operating manual for the captive bolt being utilized. Not all captive bolt weapons use variable charges. A more powerful 0.25 calibre cartridge is now in common use in captive bolt weapons. A new era of penetrating captive bolts has been developed and used correctly, produces enough damage to the brain including the brain stem that it can be used as a single-step euthanasia device. These new captive bolts systems have several interchangeable captive bolts with varying lengths and thicknesses as well as several cartridges of varying strengths. The correct combination of captive bolt size and the cartridge is determined based on pig size, age, and type (suckling, nursery, etc.) because this system is designed to be used as a single-step euthanasia method that causes massive damage to the brain including the brainstem, the target location is moved slightly higher to maximize the destruction of the brain stem.

Monitoring effectiveness of the use of penetrating captive bolt

The use of the captive bolt device, whether penetrating or non-penetrating, typically produces immediate collapse followed by a period of postural rigidity and then gradual relaxation. Often, correctly "bolted" pigs will have a period of involuntary kicking and paddling. Pigs that are rendered insensible should demonstrate signs such as lack of a corneal reflex, no deliberate movements, and no rhythmic breathing. If there is doubt as to whether a pig is insensible, the animal should be immediately re-stunned, or an adjunct euthanasia method should be applied.

B. Disposal

Safety, biosecurity, and compliance with environmental regulations are the primary issues to be kept in mind for the disposal of large volumes of ASF-affected material. Burial is the primary method of disposal for carcasses, litter, discards from cleaning and disinfection activities, and other potentially contaminated material.

Ideally, pigs should be disposed of on-site by burial. Alternatively, if no approved site is identified, they can be transported and disposed of elsewhere. Contaminated feed shall be buried along with other infectious materials at the site. Similarly, manure, litter, and feed must be buried. Equipment and items that cannot be disinfected effectively have to be collected in a disposable bag and must be burned.

Precautions to be taken while transporting carcasses to disposal site:

- To prevent virus spread, you must seal the containers, so they do not leak liquids or release debris such as feeds or litter materials. Large containers like gunny bags or biohazard materials are used to pack carcasses for easy and faster transport.
- Ensure to thoroughly wet the carcasses with disinfectant solution.
- Carefully inspect the container for any breaches, holes, large cracks, or sharp edges.
- Avoid puncturing any plastic bags with your feet or tools. Always inspect the plastic bags to ensure it is not damaged. Small plastic holes can be repaired easily with tape.
- Plastic openings must be sealed using duct tape. Similarly, the container opening must be sealed with plastic and duct tape from the outside of the containers.

Disposal by burial

The first choice, by far, would be an on-site burial. Identify the site for burial such that wild animals or dogs cannot access the carcasses once they are buried. Dig one or more pits to bury all the pigs on the property. Considerations include the amount to bury, site availability, soil type, water table, nearby wells or ponds and digging equipment available.

Burial site selection

Important considerations include:

- Access to the site – for both equipment to dig the burial pit and for the delivery of livestock, carcasses, or other materials to be buried.
- Environmental – distance to water sources, bores and wells; the height of water-table; proximity to buildings, especially houses; proximity to neighbours or public lands including roads; the slope of the land, drainage to and from the pit; permeability of soil; sufficient space for the temporary storage of overburden; and direction of the prevailing wind.
- Construction considerations-avoid rocky areas (slows digging and increases costs) but select soils with good stability capable of withstanding the weight of the equipment used for the construction of diversion banks if required.

If government land is not available, leasing/compensation for private land for the disposal pit should be considered after negotiation depending on the emergency. If the disposals of the pigs are undertaken in the city area, the selection of the site should be done jointly with the city corporation.

Burial pit construction

- Following site selection, a pit of 5m deep and 3m wide should be dug for one adult carcass.
- A minimum of 1m distance from the water table should be maintained.
- Carcasses should be covered by about 2m of soil, with an unbroken layer of slaked lime in between. If this lime is applied directly to carcasses the decomposition process will be significantly delayed.
- Disinfectants are needed to be sprayed on equipment used and, on the pathway, used to take carcasses to the pit.

Disposal by burning

The procedure is as follows:

- Pile up the infected materials to build a pyre.
- Pour fuel like kerosene (but not petrol/ gas) on the fire bed and place rags soaked in kerosene every ten meters along the length of the fire bed.
- Make sure that someone always watches the fire and replace any infected materials that fall off the fire.
- The ashes can be buried as described in the section on the burial above.

In the case of low-quality pigsties where the scrapping of the litter materials is difficult, the pigsty should be dismantled and burnt on the site on the same day along with the litter materials in the infected areas. The compensation for the pigsty should be provided based on the assessment of the cost by the culling team and compensation committee.

Protection of disposal pit

All the disposal pits should be properly fenced using iron poles and barbed wires depending on the field situation. In the case of remote areas, the use of wooden poles and barbed wires may be explored to reduce the cost of fencing.

Steps to follow Culling and Disposal:

- Culling and disposal team members should remove PPE and place them in a trash bag, which are to be placed in biohazard plastic bags before crossing over the culling and decontamination line.
- By the end of each workday, culling and disposal team members shall dump all the used PPE and other infectious materials.
- All shall scrub and disinfect shoes, thoroughly wash hands at the wash station, and sanitize hands.
- All tools and other equipment must be cleaned and disinfected before being brought across the culling and decontamination line.
- All personnel must disinfect their foot by dipping in a footbath before leaving the place.
- All parts of vehicles (especially tyres) must be disinfected at the culling and decontamination line.
- Once the personnel protective equipment has been removed, designated personnel must disinfect personal footwear.
- Personnel must not re-enter the infected premises without following the requirement for entering the infected premises.

9.6 SOP for Decontamination

Purpose

This SOP is to ensure that all decontamination procedures are carried out successfully, post disease outbreak. Decontamination means the removal or neutralization of infectious agents (ASF virus) through the process of cleaning and disinfection. The purpose of decontamination is to ensure that the live ASF virus does not remain and re-emerge on the premises after depopulation.

Users/Target: Decontamination team

Composition of the team

- Supervisor: Regulatory and Quarantine Officer (Veterinarian).
- Assistants: BFDA Livestock Inspectors (one in each decontamination group).
- Hired and trained personnel for cleaning and disinfection: two in each decontamination group.

Materials and Equipment Required

? ***Personal Protective Equipment (PPE)***

- A coverall.
- Face mask.
- Goggles (chemical splash).
- Outer gloves – (Nitrile).
- Inner gloves – (Vinyl, 4).
- Shoe covers.
- A plastic apron.
- Rubber boots.
- Multiple sets of PPEs will be necessary to allow workers to take breaks.

All the 3-D members involved in the operation should use gumboots and thorough disinfection while moving from one house to the other.

? ***Disinfectants***

The table below shows different disinfectants effective against ASFv.

Table 5: Disinfectants effective against ASFV

Product name	***Active ingredient(s)***	***Use site(s)***
Virkon S ®	Sodium chloride	Animal feeding/watering equipment, livestock barns, pens, stalls, stables, equipment, hog farrowing pen

	Potassium peroxymonosulfate	premises, hog barns/houses/ parlours/pens, animal quarters, animal-transportation vehicles, agricultural premises, agricultural equipment, and human footwear.
Pheno Cen Germicidal Detergent	o-Phenylphenol, potassium salt p-tert-Amylphenol, potassium salt Potassium 2-benzyl-4-Chlorophenate	ASFV in livestock pens, manure, equipment (livestock, feeding and watering, farm), hog farrowing house, hog houses, animal quarters, and shoe baths.
Low pH Phenolic 256	o-Phenylphenol 2-Benzyl-4-chorophenol	ASFV in livestock premises, equipment (feeding and watering, livestock, animal), livestock/animal transportation vehicles, hog farrowing houses, hog barns/houses/parlours/ pens, farrowing equipment, and shoe baths.

? ***Decontamination supplies***

- Hand-operated and power sprayer to dispense disinfectants.
- Water tanks (500 litres).
- Rake lawn and Rake gravel.
- Barrier/security line tape.
- Shovel – long handle.
- Scoop shovel.
- Wheelbarrow.
- Trash containers.
- Roll duct tape.
- Ropes.
- Regular brooms, whisk brooms and dustpans.
- Scissors.
- Rolls of paper towels.
- Alcohol wipes.
- Heavy tie-down straps.
- Box of large and small plastic bags.
- Plastic tie-downs.
- Footbath with tray and mat.
- Sharp's container.

? ***Other supplies required:***

- Maintenance tools (screwdrivers flat and Phillips, hammer, adjustable wrench, crowbar, and scrapers).
- Masking tape.

? ***Personal cleaning and disinfection supplies***

- A scrub brush for removing dirt and other particles before using disinfectants.
- Soap to wash legs, hands and face.
- A plastic basin to create a foot bath.

? ***Biohazard control materials***

- Alcohol pads, 70% ethanol - these are generally used to wipe hands after removing PPE.
- A red biohazard bag for placing used PPE.
- A container with a sprayer nozzle.
- Antiseptic wipes/sanitisers
- Eyewash.
- First-aid Kit.
- Flashlight.

General consideration

This should be a detailed property assessment starting with making a map and marking the location of electrical and water lines, drains, effluent runoff.

Cleaning and disinfection activities of infected premises should be limited to areas inhabited by or exposed to pigs. In scavenging pigs, all the surrounding premises of the house including the kitchen garden where the pigs have scavenged should be disinfected adequately.

Materials to be disinfected fall into three categories:

- Structures: Pigsty
- Clutter: Items that are not structured for housing pigs and require judgment as to whether they can be cleaned and disinfected effectively or must be discarded
- Trash: Items that impede the cleaning process and should be discarded.

Frequency of disinfection:

Heavy disinfection of the infected shed and burial sites for one week. After that disinfection should be done alternately for 21 days.

Decontamination procedures

A. Preparation for decontamination

- Identify and establish a proper site outside and close to the periphery of the culling and decontamination line for putting on PPE, and unloading materials and equipment required for decontamination. Where the infected area is accessible by road, a decontamination crew vehicle shall be parked at this site.
- Before entering the infected premises, assemble the team and organize into groups as per the specific tasks to be performed in an orderly manner and distribute the materials and equipment to each member. The team leader shall then provide a necessary briefing to all decontamination groups.
- Put on PPE before crossing the culling and decontamination line (protected zone).
- The decontamination team shall be divided into groups – the first group should start decontamination in the infected farms and other groups shall start decontamination from the periphery of protected zones and move towards the centre of the infected area.
- Once personnel have entered premises, they must not cross back over the culling and decontamination line for any reason, without removing and proper disposal of all PPE and personal disinfection.
- Groups identified for decontamination of the infected farms shall only come out after completing their task.
- The decontamination team should allow the culling and disposal team to complete their task and then only start their operation.
- It is important to wear PPE when mixing disinfectants because it can irritate the skin and eyes.

B. Preliminary disinfection

It is designed to quickly start and rapidly reduce the amount of virus present on the premises.

Any area known or suspected to be contaminated is sprayed.

The important area, structures, materials and equipment for cleaning and disinfection *inter alia* include:

- Pigsties and the surroundings.
- Feed storage area.
- Culling sites.
- Disposal sites.
- Processing facilities.
- Watering and feeding troughs.

- Access roadways and pathways used for moving pigs and pig products including other risk goods (fomites).
- Vehicles.
- Spraying should be repeated up to 5 times a day. Disinfection with Virkon® S is considered very effective against ASFv.

C. Clean-up

- The aim is to remove, without using water, all manure, debris, feed, etc., to expose surfaces for second-round disinfection. This is very important as organic material reduces any disinfectant effectiveness.
- All structural surfaces must be cleaned of any litter, dirt, or other contaminated materials.
- The next step is a wash down with a low-pressure sprayer using a detergent or bleaching powder.
- Fences should be thoroughly cleaned and disinfected.
- If the facility has significant evidence of rodent activity, extermination should be done before starting the cleaning and disinfection effort.

D. Full-scale disinfection

- Disinfectant to be sprayed in the following order:
- Roofing ➡️ walls and ➡️ finally the floor.
- Inspection must be carried out to ensure that everything has been satisfactorily cleaned up.
- Another round of full disinfection shall be carried out one week later.
- Final disinfection before restocking should be done.

Decontamination of equipment used for decontamination.

- The primary purpose would be to disinfect anything used during stamping out. This would include items like excavators, backhoes, torch, etc.
- Apply the same principles including cleaning first followed by a low-pressure detergent spray, inspection then disinfection spray. Repeat the inspection and disinfectant spray.
- If any trucks, vehicles, motorcycles, etc. are on the contaminated site, they must be decontaminated before leaving the premise.
- Particular attention needs to be paid to mats under the driver's feet.
- Vehicle interiors, including trunks, can be wiped down with clothes soaked in disinfectants.
- All underparts and wheels of cars should be sprayed with water and disinfectant.

Personal decontamination

The following procedures will apply to ALL personnel before leaving an infected area.

- Culling and disposal team members walk to the cleaning and disinfection line and remove PPE and place them in a trash bag, which is to be placed in a biohazard plastic bag.
- Hands must be scrubbed and washed.
- Warm soapy water is recommended for washing face, hair, skin, etc. Alternatively, the pH of the washing solution can be raised (by adding sodium carbonate) or lowered (by adding citric acid) to enhance antiviral action.
- Hair should be washed/sponged down with shampoo.
- Boots and shoes should be scrubbed down; particular attention being paid to the sole.
- The person then walks across the area, washes feet in a footbath, changes into clean overalls and street shoes, and leaves directly without re-exposure to contaminated areas.
- The plastic bags containing used overalls and other articles are sealed and given a second wash down in disinfectant and then either buried or burnt.
- On returning to home or lodgings, the person should have a long hot bath or shower.

9.7 Protocol for Mixing Virkon S ®

Precautions to be taken while mixing:

- Safety or protective gear is required when mixing Virkon S ®.
- Assigned individuals must wear a face shield or safety goggles, a dust mask, and rubber gloves.
- Mix the solution in a separate, well-ventilated room (if possible), or outside.
- Restrict the number of people in the mixing area. Follow the requirements for handling and storage of disinfectant.

Equipment and Supplies Needed

A. Safety equipment needed:

- Face shield or safety goggles.
- Rubber gloves.
- Coveralls.
- Dust mask.

B. Supplies needed:

- 1.0, 2.5, or 5.0-gallon plastic container with locking lid.
- Funnel.
- Plastic measuring spoon or scoop (included with the Virkon S ®).

Procedure

- Reseal the container holding Virkon S ®powder.
- Pour Virkon S ®solution into the 1.0, 2.5, or 5.0-gallon plastic container using a funnel. Close container tightly.
- Dispose of the solution after seven days or when it begins to change from yellow to clear.
- Wash hands and any other areas where the solution or powder may have come in contact with the skin. Clean the mixing area.

Handling Virkon S ®Disinfectant

- Store powder tightly in a closed plastic container in a cool, dry place. Ensure that the area where Virkon S ®is stored is secured and cannot be accessed by unauthorized persons.
- Follow instructions on the label for application and disposal.

9.8 SOP for sample collection for ASF diagnosis

Purpose

The purpose of this document is to describe the procedure for sample collection, storage and shipment of samples to the National Veterinary laboratory for the detection of ASFv.

Scope

This procedure can be applied in any kind of sample collection from porcine for the detection of viral disease by PCR and histopathology.

Equipment and Materials

- EDTA vacutainers for whole blood for PCR.
- Sterile HP container.
- Sterile 50ml plastic tubes.
- Sterile syringe and needles.
- Cold/Ice packs for transport.
- 10% buffered formalin- histopathological samples only.
- Cool Box.
- Post-mortem set.
- Viral transport medium.
- Biohazard bags.
- Personal protective equipment.
- Sodium/calcium hypochlorite (Bleach): 0.03% - 0.5% active chlorine.

Procedure for sample collection and storage

Molecular

Where ASF is suspected, the following samples should be sent to the laboratory:

- Blood – shall be collected from ear vein or cranial vena cava (non-surgical) in EDTA anticoagulant tube.
- Tissues – spleen, lymph nodes, lung, tonsil kidney and bone marrow.

The fresh tissues should be kept as cold as possible, without freezing, and should be shipped to the nearest laboratory at the earliest. After the samples arrive at the laboratory, they should be stored at –70°C if the processing is going to be delayed.

Histopathology

Bocks of tissue not more than 0.5 cm thick and 1–2 cm long are cut and placed in neutral buffered 4–10% formalin, which should be at least ten times the volume of the tissue sample. Store and pack formalin-fixed tissues separately from fresh tissues, blood, and smears. Care should be taken to ensure that formalin-fixed tissues are not frozen.

Shipment of samples

Sample Information

Information and case history should always accompany the samples to the laboratory and should be placed in a plastic envelope on the outside of the shipping container. The sample submission form (See Annexure 13.10) should be filled and submitted to the receiving laboratory along with the samples.

Sample packaging

The recommended procedure for packing samples are as follows:

- Put the samples in a primary container with screw caps and wrap them with paraffin film or adhesive tape individually to prevent leakage of fluid. The wrapping of primary containers should be carried out in clean surroundings. Put the primary container into a watertight, spill-proof secondary container with absorbent cotton wool sufficient to absorb the entire contents of the primary container (in cases of leakage).
- Place the secondary container in an outer container. This should be a polystyrene foam box covered with a hard box or other appropriate containers (E.g., coolbox).
- It is recommended that a freezer box/ice packs are put outside the secondary packaging to ensure that all materials are kept cool and not frozen during shipment. These packs should be pre-frozen at – 20 degrees centigrade before packaging.

Transportation of specimens

The specimens should be forwarded to the laboratory by the fastest method available. If they can reach the laboratory within 48 hours, samples should be sent refrigerated.

9.9 SOP for detection of ASFv by Real-time PCR

Introduction

African swine fever virus (ASFV) is the causative agent of African swine fever (ASF). ASFV is the only known virus with a double-stranded DNA genome transmitted by arthropods. The virus causes a lethal haemorrhagic disease in domestic pigs. Some isolates can cause the death of animals as quickly as a week after infection. In all other species, the virus causes no obvious disease. ASFV is endemic to sub-Saharan Africa and exists in the wild through a cycle of infection between ticks and wild pigs, bush pigs, and warthogs.

Purpose

The purpose of this procedure is to rapidly detect the specific presence of African Swine Fever Virus (ASFV) DNA in porcine clinical material by the real-time polymerase chain reaction (PCR) technique using King et. al 2003, procedure.

Scope

This procedure can be applied in any kind of porcine clinical sample such as EDTA-blood, serum and tissue homogenates and in cell culture supernatants. It is particularly useful for identifying ASFV DNA in porcine tissues that are unsuitable for virus isolation or antigen detection, because they have undergone putrefaction, or when there is good reason to believe that virus may has been inactivated before samples are received in the laboratory. PCR technique is highly sensitive, and its detection limit is below one infectious viral particle.

Test principles

Polymerase chain reaction (PCR) is a molecular genetic technique that allows the specific detection of ASFV DNA by enzyme-based amplification of a short viral genome fragment defined by a specific primer set. Under controlled conditions, multiple copies of DNA are generated by the action of the DNA polymerase enzyme, which adds complimentary deoxynucleotides (dNTPs) to a piece of DNA known as the "template". Real-time PCR is an advanced amplification method, which allows the automated detection of the amplified product, reducing the risk of carry-over contamination with increased specificity and in most cases, even sensitivity. PCR method requires the first step of viral DNA extraction from the original material to be analysed, which will be the template for the PCR. In real-time PCR, the appearance of the amplified product is monitored continuously, in special equipment, with the incorporation in the reaction mix of a fluorescent dye that will give a fluorescence signal in a proportional way to the amplicon accumulation. By determination of fluorescence signal intensity in each amplification cycle, a sigmoid-shaped curve, that represents the amplicon appearance along with the PCR, will be obtained. The described ASFV real-time PCR method uses a primer set and a specific TaqMan probe directed to a highly conserved region of the

viral genome, VP72, which ensure the detection of a wide range of ASFV isolates, belonging to all the 24 known virus genotypes. The primers amplify a DNA fragment of 250 bp, from nucleotide position 2041 to 2290 of the complete VP72 gene sequence of the reference strain BA71V (GenBank accession no. ASU18466). TaqMan probe employed for amplified product detection is labelled with a reporter at 5' end [6-carboxy-fluorescein (FAM)] and a quencher at 3' end [6-carboxy-tetramethyl-rhodamine (TAMRA)]. PCR is a rapid method, which can be performed in less than four hours, and highly sensitive, allowing viral detection even before the appearance of clinical symptoms.

Equipment and Materials

Equipment

- QuantStudio-5/real time PCR machine.
- MINI spin/ microcentrifuge for Eppendorf tubes.
- Heating block/water bath.
- Freezers -20ºC.
- Freezer -80ºC.
- Fridge 2-8ºC.
- Vortex.
- Bio-Safety Cabinet, Class – II.

Materials

- Single-channel pipette 1-10µl.
- Single-channel pipette 2-20µl.
- Single-channel pipette 20-200µl.
- Single-channel pipette 100-1000µl.
- Micropipette tips of 1-200 and 200-1000 µl, sterile.
- Micropipette tips with the aerosol resistant filter of 1-10, 2-20, 20-200 and 100- 1000 µl, sterile.
- Microcentrifuge tubes of volumes 0.2, 0.5, 1.5, and 2 ml, sterile.
- DNA extraction kit, Qiagen
- Ethanol 100%, Merck
- Forward primer ASFV 5'- CTG CTC ATG GTA TCA ATC TTA TCG A -3'
- Reverse primer ASFV 5- GAT ACC ACA AGA TCR GCC GT - 3'
- Probe ASFV 5' FAM-CCA CGG GAG GAA TAC CAA CCC AGT G-TAMRA
- AgPath-ID, One-Step RT-PCR Reagents, Catalogue number: 4387391
- Distilled H2O, sterile, PCR grade.
- Positive control; Known diluted ASF sample.
- negative controls: Nuclease free water.
- Latex or nitrile gloves.
- Biohazard bag.

Procedure

Extraction of DNA (Template DNA)

- Isolate a suitable piece of tissue and place it in a UV-crosslinked 1.5mL tube.
- Add 180 ml Buffer ATL and 20ml Proteinase K and vortex.
- Place in the 55oC incubator for 3 hours or overnight.
- Remove from incubator, vortex, add 200ml Buffer AL and vortex.
- Place in a heat block at 70oC for 10 minutes.
- Add 200ml 100% Ethanol and transfer the entire volume onto the spin column.
- Centrifuge at 8000 rpm for 1 minute; discard flow-through.
- Add 500ml Buffer AW1 and centrifuge at 8000 rpm for 1 minute, discard flow-through.
- Add 500ml Buffer AW2 and centrifuge at 13000 rpm for 3 minutes, discard flow through.
- Place spin column on UV-crosslinked 1.5mL tube, add 200ml buffer AE. Let sit for 1 minute, then centrifuge at 8000 rpm for 1 minute. Repeat and then combine flowthroughs for a total volume of 400ml.
- Store the extracted DNA at 4oC for immediate use, otherwise at -80oC for the long term.

Note: The RNA extraction kit from Qiagen can be used for DNA extraction as well.

DNA amplification

Master mix preparation: In a sterile 1.5 ml Microcentrifuge tube, prepare the PCR reaction mixtures described below for the number of samples to be assayed.

Pipetting steps	Master mix reagents	1x volume (reaction 25ul)
1	Nuclease-Free Water	4.5
2	2X RT-PCR Buffer (Ambion P/N AM1005)	12.5
3	FAM-TAMARA PP MIX (ASFV Risatti PPMIX)	2
4	25X RT-PCR Enzyme MIX	1
	Total Volume	20

Add 20 µl of the PCR reaction mix to the required number of 0.2 ml optical PCR tubes including the positives controls and the negative controls, adding at least one additional sample to minimize pipetting mistakes.

Sample addition

- Add 5µl of DNA template to each PCR tube. Include positive control (5 µl of ASFV DNA) and negative control (5 µl of nuclease-free water).
- After the addition of the template, close the reaction tube and spin down the PCR mix.
- Place all tubes in an automated real-time thermocycler.
- Run the incubation program detailed below.

PCR cycle condition

- 1X 45°C 10 min, 95°C 10 min
- 45X 95°C 15 sec, 60°C 45 sec
- Program the fluorescence collection in the FAM channel and quencher as TAMRA.

Analysis and interpretation of results

Interpretation of the results: In a positive sample, a sigmoid-shaped amplification curve will be obtained, indicating the cycles number versus reading fluorescence level, where the Ct value will be under 40. A negative sample will maintain the fluorescence profile under the background fluorescence level and the equipment will not report any Ct value. Therefore, a negative sample will show a Ct value ≥40.

Critical points

Because PCR is a highly sensitive technique, the most critical point along all the analysis procedure is the considerable risk of carry-over contamination, and the false-positive results that could be obtained in this situation. The contamination could be due to the ASFV itself present in the positive analysed samples or the positive controls included in the DNA extraction procedure; also, it could be due to ASFV DNA obtained after amplification of a previous PCR. Personnel working on PCR must follow and carry out some strict work rules to minimize the contamination risk associated with the PCR technique:

- All steps of sample analysis by PCR should be performed in separate locations, using equipment and material specific for each one: sample preparation, DNA extraction, PCR mix preparation, and removal of PCR products.
- Personnel must work always with clean nitrile or latex gloves in the PCR laboratory.
- Change of gloves whenever personnel go into a different PCR area.

- Tubes containing amplified product should never be opened and manipulated in another laboratory distinct to that exclusively assigned to their analysis by electrophoresis, where they will be discarded.

Waste disposal

All the wastes should be discarded after being autoclaved.

9.10 Sample Submission form

Sl. No.	Sender Details		Farm Details									Animal Details							Sample Details						
	Agency	Name/Designation(Ph.No)	Owner name	Farm type	Farm location (GPS)	Farm size	Domesticated/wild Pigs	Village	Gewog	District	Contact details	Species	Age	Sex	Breed	Health status (Sick/dead/Normal)	Clinical History	Treatment details	Sample ID	Colelction date	Type of sample	Pooled sample	Transport media / preservatives	Test requested	

9.11 Guidelines for Compensation

Background

Early detection and reporting, as well as rapid response to an outbreak of ASF, depend critically on the incentives for pig owners to quickly report any sick and at-risk pigs to the veterinary authority. In confirmed cases of ASF, the government decides mandatory culling. Without adequate compensation arrangements in place, pig owners will have no incentive to report any sick and at-risk pigs that may result in the loss of all the herds. Therefore, it is essential to establish a fund within the government to compensate the affected pig owners during mandatory culling.

The guideline intends to provide information on the operational aspects of the compensation fund to ensure quick and fair financial compensation to the affected pig owners in the event of an enforced culling during the outbreak of ASF. The Livestock Act of Bhutan 2001 under its sub-section 9.3 clearly states that the government has the authority to compulsorily destroy animals, animal products or feeds, or any consignments that it considers to be risky and pays compensation as prescribed by the Ministry.

Objectives

The main objective of this guideline is to outline the operation and payment procedures for compensation modalities in the event of an ASF outbreak in the country.

Eligibility for Compensation

Compensation payments will be made only:

- if mandatory culling measures have been announced and put into effect by the NICC. Pig culled in index farm may be compensated based on investigation findings of IOC.
- for pigs culled, commercial feed and feed materials disposed and destroy under the supervision of 3-D team (Depopulation, Disposal, and Decontamination); based on completion of all documentation as prescribed in this guideline; as proposed by IOC and after verification by compensation committee after identifying those eligible for compensation payments, ensuring that there will be no multiple claims.
- if the commercial/semi-commercial entrepreneurs have not received an insurance claim from the concerned agency.

Compensation will not be paid for:

- pigs that have died because of any other disease.
- state-owned piggery farms.
- pigs with conflicting ownership status, as in the case of stray or uncontrolled pigs.

The Compensation Committee shall liaise with the insurance companies in expediting insurance claims wherever applicable.

Disbursement mechanisms of the compensation fund

The NICC shall approve the compensation payments as and when proposed by the Compensation Committee through the Incident Operation Centre. Quarantining, culling, disposal, and disinfection will be undertaken by the IOC in line with provisions laid out in the NASFPCP.

The IOC under directives from the NICC will implement the compensation procedures. A committee will be instituted to implement the actual compensation calculation and payments of compensation as approved by the IOC. For the commercial farms although the same process will be followed the payment will be released only after approval from the NICC.

Responsibilities of compensation committee:

- Verify and approve the list of pigs and other products eligible for compensation in the villages/farms.
- To make payments to the eligible farmers in a fair, transparent, and timely manner.
- Compile daily records of the culled pigs, properties/ materials destroyed and owner details (address, main occupation, etc.).
- Review the market value of the pigs and fix the compensation rates.
- Get proof of payment from the recipient of the compensation.
- Submit completed documents to the IOC for payments made.

Roles and responsibilities of IOC

The IOC will be responsible for the following tasks:

- Call for an immediate meeting of the compensation committee in line with the provisions of the NASFPCP.
- Provide forms to the 3D teams and compensation committee for the recording of details of pigs culled, and feed destroyed, etc.
- Create awareness to the owners on the compensation available for the mandatory culling of pigs before the actual start of the 3-D operation.
- Review and approve the compensation rates proposed by the committee for further submission to the NICC for final approval.
- Maintain proper books of accounts for all compensation made for future auditing.
- Follow up with NICC for the timely release of the compensation fund for further disbursements.
- Compensation will be paid as soon as funds are received from the Ministry of Finance through the concerned RLDC/RVH&EC.

Compensation procedures

Upon official declaration of an outbreak of ASF, the NICC will activate IOC at the outbreak area. The IOC will carry out disease outbreak investigation, 3-D Operations, movement control, surveillance, etc. through RRTs in the infection and protection zones, while the compensation committee will initiate the processing of payment of compensation to the eligible owners.

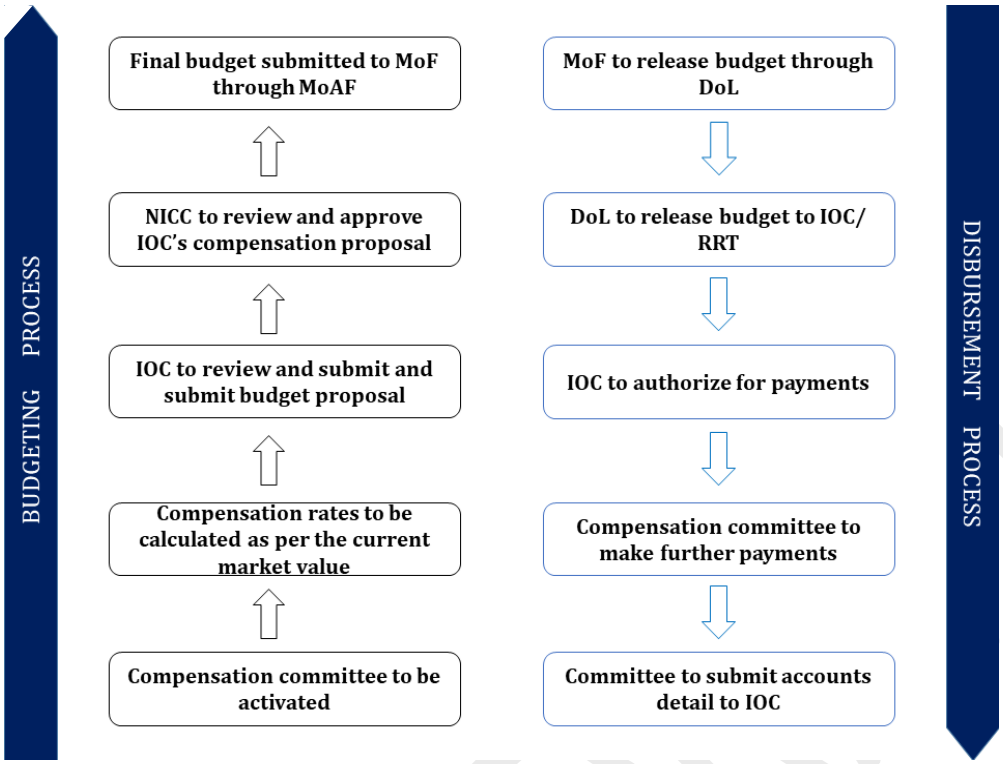


Figure 6: Budgeting and disbursement process for compensation

Compensation Calculation

The compensation shall be paid at the rate prescribed by MoAL based on farm biosecurity.

Mode of payment

The Compensation Committee will collect the copy of slips from the 3-D Team which should have details such as the owner's name, location, and what (pigs, feeds, etc.) had been destroyed. The details in the slip must be entered in the summary culling record and individual owner record forms. The owner must produce the slips to the compensation committee and the payment will be processed after thorough cross-checking. The compensation committee will process and submit the completed documents to the IOC for processing approval from the NICC as well as for mobilizing the fund for compensation. The compensation must be paid as soon as funds are released by the government.

9.12 Logical Framework

Goal and Purpose	Description	Performance Indicator	Means of verification	Assumption	Time frame
Goal	Prevent and control ASF outbreak in Bhutan thereby ensuring the livelihoods of farmers.	OIE accepted ASF freedom status. No case of ASF detected.	Submission of ASF freedom dossier to OIE.	Policy support for NASFPCP in place.	
Purpose	Strengthen diagnostic, surveillance, prevention and control, legal framework and stakeholder/partnership for effective implementation of NASFPCP in the country	ASF freedom status maintained	Assessment report using disease monitoring and assessment tool of OIE.	National (Policy Support) and international partnership in place.	

Diagnostic System

Diagnostic system	Description	Performance indicator	Means of verification	Assumption	Time frame
Out	The Laboratory system is strengthened by the introduction of virus	A laboratory test in compliance	OIE WAHIS report, Lab quality	Established links with	

	isolation techniques and RT-PCR test. Develop a quality assurance system on ASF.	with OIE diagnostic standards and validation.	assurance assessment report.	FAO and OIE, SAARC.
Activities	Introduce ASF virus isolation technique at the national laboratory	Nos. of samples isolated	Lab results and report	Resource support in place
	Training of laboratory staffs on virus isolation	Nos. of staffs trained	Training Report	Funding support in place.
	Participate in the ASF proficiency testing scheme with laboratories in the region.	No. of proficiency test	Proficiency test certificate.	Bhutan joins the OIE lab twinning programme.
	Strengthen/establish linkages with regional and world reference laboratories	Nos. of institutional linkages established; Nos of samples referred and tested	MoU, correspondence, Lab result/report	Policy support and agreement from the regional laboratories
	Strengthening of regional and district laboratories	No. of ASF rapid test kits distributed; No. of staff trained	Invoice, Training report	Fund support in place

Surveillance system

		Description	Performance Indicator	Means of verification	Assumption	Time frame
Surveillance system	Outcome	Enhance surveillance in domestic and wild pigs.	Nos. of sample collected. Nos. of surveillance sites covered.	Surveillance results/ report	Assured human and financial resources	Annually
	Activities	Develop ASF focused epi-networks.	Nos. of agency/individual in the epi-network	Database/records and reports of the network.		
		Conduct training of regulatory and field livestock officials on detection of ASF.	Nos. of staffs trained	Training Report/training assessment report	Training of relevant stakeholders	
		Conduct ASF surveillance in wildlife in collaboration with the Department of Forests and Park Services.	Nos. of surveillance conducted	Surveillance Report	Mapping of biological corridors.	
		Conduct import risk analysis on ASF.	Nos. of import risk analysis conducted	Risk Analysis Report		

9.13 Budget estimate for Risk-based action plan: Logical framework

Items	Qty.		Budget (Million Nu)					
		Unit cost (Nu)	Y 1	Y 2	Y 3	Y 4	Y 5	Total budget
1. Laboratory diagnostic system								
a) RDT (kit)	100	3500	0.1	0.1	0.1	0	0	0.35
b) Ag ELISA (kit)	2	80000	0.1	0.1	0	0	0	0.15
c) Ab ELISA (kit)	2	91000	0	0	0	0.1	0.1	0.2
d) PCR reagents	5	140000	0.1	0.1	0.1	0.1	0.1	0.7
2. Extension & communication								
a) Extension materials development	1	200000	0.2					0.2
b) Awareness education	1	400000	0.4	0.4				0.8
3. Training								
a) Serology technique	1	200000	0.1	0.1				0.2
b) Molecular technique	1	100000	0.1					0.1
c) Virology technique	1	100000		0.1				0.1
d) Epidemiology and outbreak response (disease simulation)	1	500000	0.3		0.2			0.5
4. Disease surveillance								

a) ASF and other small ruminant disease active surveillance and research.	2	800000	0.8			0.8	0.8	2.4
5. Other/coordination								
a) National ASF coordination meeting and technical working group meeting	5	100000	0.1	0.1	0.1	0.1	0.1	0.5
b) National ASF workshop	2	800000	0.8			0.8		1.6
6. Contingency	1	250000	0.1	0.1	0.1	0.1	0.1	0.25
TOTAL								**12.77**