

SEAFMD 2020

A roadmap for foot and mouth disease
freedom with vaccination by 2020
in South-East Asia



September 2007



Front cover image

Vietnamese child tending to cattle that have recently recovered from FMD

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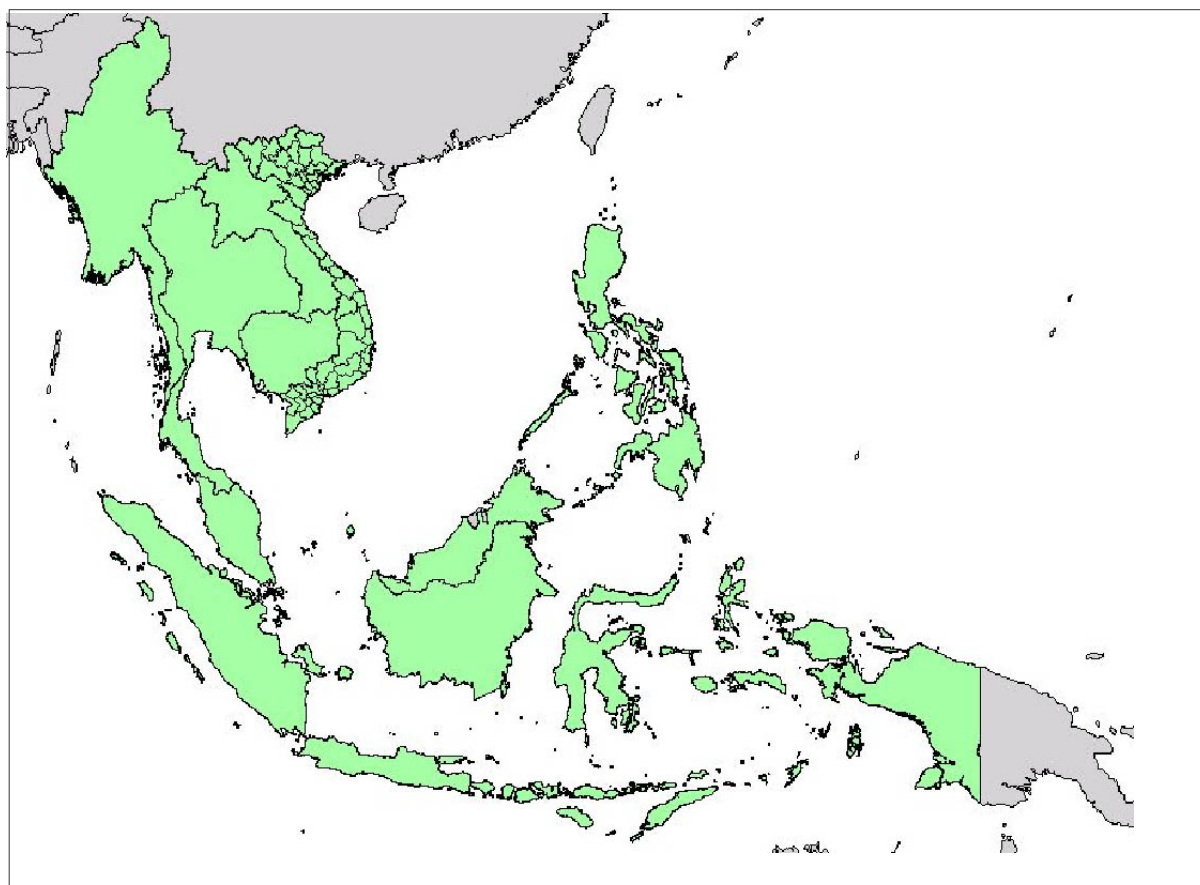
Back cover image

Buffalo crossing a river in Vietnam

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SEAFMD 2020

A roadmap for foot and mouth disease freedom with vaccination by 2020 in South-East Asia



Direct applicability of the South-East Asia Foot and Mouth Disease Campaign (SEAFMD) approach to the prevention and control of other transboundary animal diseases, such as highly pathogenic avian influenza (HPAI) and classical swine fever (hog cholera)

A programme in support of the strengthening of veterinary services in the region

September 2007

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Buffalo in Vientiane, Lao PDR



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SEAFMD 2020 provides a roadmap and strategic direction for achieving freedom from foot and mouth disease with vaccination in South-East Asia by 2020.

The South-East Asian FMD Programme (SEAFMD) which underpins the eradication efforts, was launched in 1997. Eight countries – Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Thailand and Vietnam – actively participate in the programme under the guidance of the SEAFMD Coordination Unit in Bangkok.

The programme is now entering its third phase of activities after achieving considerable success during Phases 1 and 2. Successes include improved disease control and prevention, effective coordination between countries, comprehensive science skills and programme training, the implementation of sound communication and information exchange strategies and the development of partnerships with industry groups. From a scientific and technical perspective, major initiatives have been taken in areas such as progressive zoning approaches with strong epidemiological and diagnostic inputs.

These activities will be continued and expanded under Phase 3 strategies with emphasis on activities such as risk analyses, surveillance, vaccination, animal movement management, governance, legislation and public awareness. In addition, efforts will be made to collaborate more closely with neighbouring countries, such as China, India and Bangladesh, to improve approaches to risk and the control of FMD.

SEAFMD is an excellent model for the regional coordination and management of a range of other major transboundary diseases, such as hyper-virulent avian influenza and classical swine fever, not only in ASEAN countries but also in other parts of the world. However, unless national veterinary services are strengthened to ensure that they can function effectively in a sustainable manner and identify and control diseases at source, the risks of transmitting transboundary diseases will remain high and will lead to serious socio-economic problems.

It is for this reason that a key policy objective of the OIE, as articulated in its IVth Strategic Plan, is investment in capacity building in countries to strengthen animal health services in a sustainable manner. When requested by countries, the OIE will arrange evaluations of veterinary services by qualified auditors using its performance, vision and strategy tool. Once shortcomings have been identified, applications can be made to governments and/or international organisations for funds to invest in animal health. By September 2007, SEAFMD countries evaluated using this tool were Cambodia, Indonesia, Lao PDR and Vietnam.

Critical to the ongoing success of the programme are the support and engagement of international organisations, such as the OIE, through its headquarters in Paris, regional representation in Tokyo and sub-regional office in Bangkok, the FAO and ASEAN, as well as bilateral donors including Australia, Japan, France, New Zealand and the EU.

I would like to express particular gratitude to the Government of Thailand for hosting the Regional Coordination Unit of SEAFMD in Bangkok, and to AusAID that has provided the prime funding and support since the inception of SEAFMD.

I encourage those already involved in SEAFMD to pursue their efforts and commitment to SEAFMD and would likewise encourage others to support the programme and achieve the ambitious but achievable target of FMD freedom with vaccination in South-East Asia by 2020.



Bernard Vallat
Director General, OIE

A Cambodian farmer with his cattle



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Emerging diseases of animals have had major adverse socio-economic impacts on countries, particularly developing economies. Disease risks are predicted to increase and strong action is required.

Many of these diseases are zoonotic, that is, they are transmissible from production, wildlife and companion animals to humans. Indeed, 75% of new infectious diseases of humans are zoonotic. Zoonotic diseases of concern include H5N1, SARS, BSE, HIV/AIDS, Ebola virus, Nipah virus and rabies.

There are a number of major production-diminishing diseases of animals that can have serious or devastating effects on the social fabric of countries and their development opportunities. Most, if not all, of these diseases are transboundary in nature, that is, they can spread between countries and even between continents, sometimes at an alarming rate.

Major problems are also posed in the area of food safety by a range of microbiological, viral, prion, chemical and toxin contaminants that are often of public health significance. Episodes of foodborne illness in recent years have been widely reported. These include, Escherichia coli O:157, Campylobacter jejuni and salmonellosis, as well as problems associated with antimicrobial resistance. There is evidence that the incidence of foodborne disease is also increasing.

There are many factors that contribute to the increased rate of emergence of these diseases in many parts of the world, including Asia. These include changes in population numbers and demographics, increased trade and tourism, intensive animal production, climatic variations and environmental damage which all alter the eco-balance of hosts and their pathogens.

The economic consequences of animal diseases are significant and at times startling. The World Bank, for example, estimates that the avian influenza H5N1 impacts on the rural sectors of a number of Asian economies could be as high as 0.7% of GDP and that the cost of serious human 'flu pandemic' could be as high as US\$2 trillion. The ADB estimates are that SARS could have a cost US\$60 billion. Preliminary work by the FAO and the ADB on recent FMD outbreaks in one SEAFMD country indicate income losses to villagers of 11% and 21.4% in cattle/buffalo and cattle/buffalo/pig farms, respectively. BSE costs would be measured in billions of dollars. The social effects of many major animal diseases have been profound, including death, unemployment, loss of income, reduction in development opportunities and trade.

This risk of emerging diseases of animals will remain high unless comprehensive and systematic actions are taken to establish improved animal health services to prevent, detect and manage animal diseases. Although recognising the fine and comprehensive work conducted in recent years to manage, for example, avian influenza and FMD outbreaks, such approaches are often emergency response activities and are not intended to establish adequate sustainable veterinary services to deal with ongoing threats.

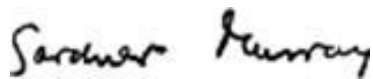
A programme that has been in place for ten years, the OIE SEAFMD is a good example of an approach that can not only help control disease but also coordinate animal health activities between countries. SEAFMD provides some of the building blocks for improved veterinary services in the region, including training of staff; enhancements to surveillance, laboratory networks and disease management approaches; the development of innovative concepts, such as progressive zoning and a more formal engagement with industry.

The SEAFMD programme is a convincing demonstration that this approach is applicable to the prevention and control of other transboundary diseases such as H5N1 and CSF. It demonstrates the need for effective veterinary services that will help minimise risks to human health, serve amenity and support livestock development, particularly in the poorer countries.

The 2020 roadmap is a 'living' document and will be modified as appropriate in the light of experience and future developments. It seeks to provide strategic directions for 'FMD freedom with vaccination' by the year 2020. Its purpose is to:

- *inform policy makers and stakeholders of the nature of the programme*
- *assist programme managers when they develop operational plans*
- *emphasise the importance of veterinary services to support public health and economic development*
- *demonstrate the applicability of the SEAFMD model to other diseases.*

A clear picture has emerged that the risks of emerging diseases of animals will increase and that action is necessary at the farm and wildlife levels to prevent, control, manage and understand disease. The adage that 'prevention is better than cure' is more real now than ever before. Policy makers, international organisations and funding bodies have a responsibility to ensure systems are in place to protect human and animal health. They should introduce 'one health' policies and encourage interdisciplinary consideration of risk and risk management in areas such as animal, public, wildlife and environmental health. Strengthening veterinary services will provide economic and human health benefits to countries and regions.



Gardner Murray

President, OIE Sub-Commission for FMD in South-East Asia

President, OIE Regional Commission for Asia, the Far East and Oceania

Background

The South-East Asia Foot and Mouth Disease Campaign 2020 (SEAFMD 2020) document provides a long-term strategic framework and a roadmap to provide guidance in achieving foot and mouth disease (FMD) freedom with vaccination in South-East Asia by 2020. This roadmap is based on the significant progress of the SEAFMD campaign since it was launched in 1997.

SEAFMD operates in eight countries of the Association of South-East Asian Nations (ASEAN), namely: Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand and Vietnam. When the campaign commenced, only Indonesia was recognised by the World Organisation for Animal Health (OIE: *Office International des Épizooties*) as FMD-free. By December 2005, FMD-free zones recognised by the OIE expanded to include Sabah and Sarawak in Malaysia and the Philippine islands of Mindanao, Visayas, Palawan and Masbate. The Philippines is aiming to achieve FMD-free status for the rest of the country by 2008.

Socio-economic benefits

FMD has major negative impacts on people's livelihoods, such as the reduction of draught power and transport in less developed countries and losses, particularly in pigs, vital to village cash income. The effect of the disease can be underestimated because it usually does not have a high mortality rate in cattle and buffalo, although losses can be high in calves and piglets. However chronic illnesses (e.g. lameness, mastitis) can seriously affect productivity. Importantly, an inability to control the disease will prevent livestock development, including potential exports of livestock and livestock products to the current and emerging high-value markets of Asia and will also hinder economic development, particularly in poorer countries. The livestock sector is one of the fastest growing agricultural sub-sectors and benefits mainly smallholders.

Concept

The basic concept is that FMD can be prevented and managed at the sub-regional level if there are sound veterinary services and professional coordination of animal health activities between countries. Member countries are responsible for their own disease management systems but coordination and support is provided by the modestly funded Regional Coordination Unit (RCU) in Bangkok. The campaign against FMD, a serious transboundary disease, will lead to control of outbreaks, minimise the debilitating impacts of the disease on communities, national and sub-national economies, improve skills in countries which can be utilised to deal with other major diseases and contribute to poverty alleviation.

Achievements

Since 1997, achievements include the establishment of first-class networks between countries, trained staff, improved laboratory, surveillance and disease management systems, the introduction of progressive zoning concepts, engagement of industry and enhanced communication and public awareness.

Phase 3, commenced in 2006, seeks to extend programmes in place and to assist neighbouring countries in the management of FMD, such as Bangladesh, the People's Republic of China and India. Phase 3 works more closely and in harmony with related programmes managed by organisations, such as the Australian Agency for International Development (AusAID), Food and Agriculture Organization (FAO), Asian Development Bank (ADB), European Union (EU) and the Australian Centre for International Agricultural Research (ACIAR), for example the AusAID/OIE Capacity Building Project and the FAO/ADB Greater Mekong sub-region (GMS) transboundary animal diseases (TADS) project. This will maximise effectiveness, improve capacity building and lead to significant animal health improvements for all major transboundary diseases in the region. These activities will promote public and animal health and economic development.

Progressive zoning

Key to the control of FMD is the introduction of progressive zoning approaches. Under this system, areas are identified and agreed as candidates for FMD management. Specific zonal strategies, definitions and rules are documented and countries work together under RCU guidance to manage and eradicate FMD. New zones are progressively identified and managed. If successful, this approach should lead to FMD freedom by 2020.

Improving veterinary services

The enhanced veterinary capacity and general animal health management capability that the SEAFMD will continue to develop has broad-based benefits for general animal health services in the region that extend beyond FMD. These capacities and capabilities seek to enhance the foundation for all animal health control strategies and services in the region. In short, improved veterinary services will support economic development and protect human health in a sustainable manner. In this regard, it should again be emphasised that the SEAFMD approach is a relevant model for prevention and control of other serious diseases, such as highly pathogenic avian influenza (HPAI) and classical swine fever (CSF) (hog cholera), which spread between countries and regions with devastating socio-economic effects.

Programme and funding

The RCU has mainly been funded by AusAID with substantial in-kind support from the Thai Government and additional support provided by others, for example the New Zealand and French governments, the FAO and the OIE Tokyo Japan Trust Fund.

A key initiative in 2008 will be the greater involvement of ASEAN in SEAFMD. ASEAN will assume a role in the SEAFMD campaign and, with others, such as the FAO and donors, will be members of the OIE-chaired Sub-Commission for SEAFMD which provides advice on the effectiveness of the campaign and its future directions.

Funding support will be required to continue the SEAFMD campaign. The 2020 roadmap details the key issues that will be addressed in Phase 3 from 2008 to 2010 as well as strategic direction until 2020. Funding requirements to maintain the RCU (for which current funding ends in December 2007) and conduct key projects for Phase 3 are estimated at US\$600 000 a year, including targeted support for less developed member countries in areas, such as the provision of small amounts of emergency vaccines.

List of abbreviations

ACIAR	Australian Centre for International Agricultural Research
ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
AusAID	Australian Agency for International Development
BSE	bovine spongiform encephalopathy
CSF	classical swine fever (hog cholera)
DLD	Department of Livestock Development (Thailand)
EpiNet	epidemiology network
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FMD	foot and mouth disease
GDP	gross domestic product
GF-TADs	Global Framework for the control of transboundary animal diseases
GMS	Greater Mekong sub-region
HIV/AIDS	human immunodeficiency virus/acquired immunodeficiency syndrome
HPAI	highly pathogenic avian influenza
JICA	Japan International Cooperation Agency
LMZ	Lower Mekong zone
LP ELISA	liquid phase enzyme-linked immunosorbent assay
MOU	memorandum of understanding
MTM	Malaysia-Thailand-Myanmar
MYZ	Myanmar zones (Sagaing/Rakhine zones)
OIE	World Organisation for Animal Health (<i>Office International des Épizooties</i>)
PSCC	Private Sector Consultative Committee
RCU	Regional Coordination Unit (Bangkok)
RRL	Regional Reference Laboratory
SARS	severe acute respiratory syndrome
SDR	standards, definitions and rules
SEAFMD	South-East Asia Foot and Mouth Disease Campaign
SPSCB	Sanitary/Phytosanitary Capacity Building project
TADS	transboundary animal diseases
UMZ	Upper Mekong zone
WRL	World Reference Laboratory

Cambodian girl tending to cattle



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Introduction

The control of FMD in the South-East Asian region gained momentum and impetus when Indonesia eradicated FMD in 1986 with the support of countries such as Australia and was then recognised by the OIE in 1990 as an FMD-free country without vaccination. Indonesia has maintained FMD-free status. This achievement has demonstrated the benefits of FMD freedom and proves that FMD can be eradicated in South-East Asia. In addition and most importantly, FMD-free status can be maintained for several decades.

The SEAFMD campaign was based on OIE recognition of FMD as a regional animal health and development issue in 1990. Subsequently, the programme became a formal OIE programme in 1994, overviewed by the SEAFMD Sub-Commission that is chaired by the OIE, with members from participating countries, ASEAN, FAO, AusAID and key donors.

The core founding members are the Philippines, Thailand, Vietnam, Lao PDR, Cambodia, Malaysia and Myanmar. Indonesia became a member at a later date because, although free from FMD, it recognised the importance of participating in regional efforts to control the disease and maintain freedom. All member countries belong to ASEAN. The SEAFMD campaign is coordinated by the RCU in Bangkok.

Three phases of the SEAFMD programme have already been implemented, as described below.

Phase 1 (1997-2001)

Phase I saw the establishment and preparation of the RCU. Links with member states and international agencies were created and the situation at the time was evaluated and needs of the SEAFMD campaign identified.

Phase 2 (2001-2005)

Strategic directions and programmes for FMD control were part of Phase 2, during which progressive zoning approaches, underpinned by surveillance and an active public awareness programme, were made. The RCU was a catalyst for the harmonisation of efforts by SEAFMD member countries to establish several FMD control zones in South-East Asia.

The first control zone was the Malaysia-Thailand-Myanmar (MTM) zone. Two zones are based on the Mekong River Basin, namely:

- the Upper Mekong zone (UMZ) with northern Lao PDR, north-east Thailand, north-east Myanmar, northern Vietnam and the southern part of Yunnan Province in the People's Republic of China
- the Lower Mekong zone (LMZ) with south of Cambodia and Vietnam as the contiguous control zone with participation of the southern part of Lao PDR and south-east Thailand as separate collaborating control zones.

In Myanmar, the Sagaing/Rakhine zones (MYZ) were established due to their role as major suppliers of cattle to other parts of the country. The Philippines is conducting a national FMD eradication programme in Luzon, supported by the FAO and funded by AusAID.

The strategies and approaches developed by the RCU are implemented in all zones, with emphasis on progressive zoning, surveillance and public awareness. The RCU has been able to coordinate additional support for the less developed member states from within the region and externally.

Phase 3 (2006-2010)

Phase 3 will consolidate national control and eradication programmes, further harmonise legislation for FMD control in member countries, improve laboratory, epidemiology and public awareness networks and work more closely with ASEAN on programme management and funding support. Since the outbreak of HPAI, the SEAFMD model has been partially adapted for use in the region and has involved the RCU in additional activities. In some cases, such as in the LMZ, HPAI and CSF have been added to the SEAFMD control programme, as only limited additional inputs have been required. Additional funding from the ADB is being provided.

Much of the support for the RCU over this period has come from national governments for their own FMD programmes and from Thailand for hosting the RCU office at the Department of Livestock Development headquarters in Bangkok. There has been continuing major funding support from AusAID, with additional support from the OIE, FAO, France, New Zealand and Switzerland. Support has been directed to the RCU or linked with national FMD/livestock development projects funded by the ADB, World Bank and bilateral activities. The RCU has played a pivotal role in the coordination and integration of funding activities to ensure the best synergies for the SEAFMD campaign.

The RCU has actively engaged the private sector in the SEAFMD campaign as freedom from FMD generates mutual benefits to both private and public sectors. The private sector has shown support for the SEAFMD campaign and will need to become more involved as the campaign progresses.

Development impacts of foot and mouth disease control and eradication

In South-East Asia, livestock is an asset much valued by smallholders who comprise most of the people involved in livestock and its commercial sector. Cattle and buffalo, the key indicators of FMD status, are mostly kept by smallholders. Large-scale commercial industries are mainly concentrated in pig and poultry production systems and, in some areas, dairy production. In the past, the livestock sector was considered subsidiary to crop production. However, livestock is now playing a vital role that is not fully recognised in the rice-based farming systems of Asia. Animals provide draught power for smallholder crop production and transport and are an asset, or 'bank'.

FMD infects ruminants and pigs and is endemic in most of South-East Asia except for Indonesia and the Philippines which is soon expected to be free from FMD. Increasing demand for livestock products from ruminants and pigs, all FMD-susceptible species, has also provided both smallholders and commercial producers the opportunity to obtain substantial economic benefits. In many countries, pigs have become a cash crop for smallholders. Indeed, livestock is the fastest growing sub-sector in global agriculture.

However, the presence of FMD prevents smallholders and enterprising traders from realising the full economic value of their livestock and restricts trading opportunities. The gender issue related to livestock production is neutral as men, women and children care for and benefit from livestock.

The control and eradication of FMD decreases both public and private expenditure on production costs which are high. However, to achieve this benefit, both public and private sectors need to make investments for the future welfare of their communities and enterprises.

Socio-economic examinations of both developed and developing countries highlight the benefits to be obtained from controlling diseases such as FMD. Cost benefits are generally greater in those countries that can engage in inter-country trading with minimal restrictions. The reality is that for many countries in the sub-region, exports are denied or severely limited because of the FMD situation and lack of controls. Even without exports, productivity can be diminished because of FMD. Villagers in particular can suffer in serious ways, including the loss of animals for periods of time for traction, transportation and as cash income to enhance living standards, for example, school fees for children and health costs.

There is a strong case for investing in prevention and control of FMD, a particularly difficult disease to manage, because the systems implemented will be a working model for prevention and control of other serious diseases such as HPAI and CSF, which are of global importance and cause debilitating losses to villagers and commercial industries. Minimising disease impacts through the implementation of FMD systems will make a significant contribution to alleviating poverty, support public health, contribute to food security and improve the overall wellbeing and development of nations, particularly the economically disadvantaged.

The loss of international trade due to FMD in ASEAN countries is a major national and community loss, in addition to the primary loss due to infections of FMD in susceptible species. The emerging markets in the People's Republic of China and Vietnam for cattle and meat products will not be accessible to Cambodia, Lao PDR and Myanmar until they improve production and control their FMD status. Market access to Indonesia, Malaysia and Singapore will depend on the FMD-free status of exporting countries.

Economic analyses of FMD control programmes in South-East Asia have indicated a favourable cost-benefit ratio, in addition to social and community benefits.

Basic principles in foot and mouth disease control and regional coordination

The major principles involved in controlling FMD include:

- identification of the foci of infection as rapidly as possible using an effective surveillance system
- prevention of infection of susceptible hosts by preventing contact of infected and susceptible herds through quarantine and movement managements
- elimination of the source of FMD virus through disinfection and the use of acceptable husbandry methods to prevent infections of susceptible animals by contaminated objects and infected premises
- increasing herd and animal immunity to FMD by vaccination

- mobilisation of political and public support for the FMD control/eradication programme through effective communication and public awareness campaigns.

In December, 2006, the status of FMD was as follows:

- Indonesia remains free from FMD
- east Malaysia (Sabah and Sarawak) was certified FMD-free by OIE in 2004
- the island of Mindanao in the Philippines was certified FMD-free by OIE in 2000 and the islands of Visayas, Palawan and Masbate were certified FMD-free in 2002; Luzon is now undergoing an eradication programme, with no cases reported since January 2006; the Philippines may be declared FMD-free in accordance with OIE standards in 2008
- Peninsular Malaysia reported sporadic outbreaks of FMD in 2006
- FMD is endemic in Cambodia, Lao PDR, Myanmar and Vietnam
- FMD is endemic in neighbouring countries such as Bangladesh, the People's Republic of China and India.

Appendix 1 provides more details on the current FMD status.

Given the highly contagious nature of FMD and the potential rapid spread of the disease within and between countries, it is important that countries with contiguous borders or those at high risk adopt common policies on FMD prevention and control and work together to share information, identify weaknesses in animal health service delivery and correct deficiencies.

Regional coordination is a key to the management of not only FMD but also other transboundary diseases in South-East Asia and is the basis for the establishment of the SEAFMD RCU. Regional coordination requires the full support of participating governments and contributory support, in cash and in kind.

SEAFMD campaign – concepts and role of the Regional Coordination Unit

The basic concept is that FMD can be prevented and managed at the sub-regional level if there are sound veterinary services and professional coordination of animal health activities between countries. Member countries are responsible for their own disease management systems, but coordination and support is provided by the modestly funded RCU in Bangkok. The campaign against FMD will lead to control of outbreaks, minimise their debilitating impacts on communities, national and sub-national economies, improve skills in countries which can be utilised to deal with other major diseases and support poverty alleviation.

The RCU coordinates animal disease activities between countries, helps identify programme weaknesses, supports corrective action and ensures coherent strategies and agreed outcomes are in place.

The RCU has a central role in the overall coordination of the SEAFMD campaign. This involves, *inter alia*:

- supporting annual meetings of the national coordinators of member countries
- assisting with reviews of national FMD plans and programmes
- arranging and providing expert support for epidemiological and surveillance programmes for each zone

- assisting each member country to help each other in a synergistic manner
- providing the link to OIE and ASEAN
- leadership in attracting funding for member countries
- providing the FMD database for the region and links to animal health information systems
- maintaining coordinated communications, media development, public awareness and training.

In addition, the RCU is well placed to provide rapid response to FMD emergency outbreaks in member countries. The monitoring and evaluation role of the RCU is an essential tool in determining the progress of the SEAFMD campaign.

With the support of member countries and the OIE, the RCU will access new technology relevant to the SEAFMD campaign as it becomes available. The RCU has now collected a wide range of material and provides a databank that can be used by member states for public awareness, training and management of the progressive zoning process. It is also the catalyst for the formalisation of memorandums of understanding (MOUs) between member states in the zones on the mainland, an ongoing activity as zones expand.

The RCU is staffed by the Regional Coordinator, Ronello Abila, an epidemiologist, Stéphane Forman, a community awareness officer, Nichola Hungerford, communications officer, and Chutikam Dhebasit, secretary. The RCU is also supported by volunteers from Australia, occasional secondments from member countries and a research programme strengthened by several post-graduate students from Murdoch University in Australia and from France. All post-graduates are undertaking FMD research in SEAFMD member countries.

The support of Thailand in offering premises to the RCU in the Department of Livestock Development (DLD) in Bangkok has been vital. The RCU has been instrumental in building privileged relationships with donor agencies such as the OIE, FAO, Japan International Cooperation Agency (JICA), AusAID, EU, other agencies and member countries. Training programmes for member country staff have been an important component of RCU activities. The RCU has been discussing improved relations with ASEAN in terms of management and funding, with the OIE providing continuing technical support.

The RCU has facilitated a steady, progressive advance in FMD control and eradication. There have been considerable achievements across the region on the harmonisation of legislation, laboratory testing and networks, animal health management, surveillance and epidemiology.

The achievements of the Regional Coordination Unit and the SEAFMD campaign

RCU achievements have been remarkable given the limited staff and modest funding available.

There has been significant progress in the control and eradication of FMD in the South-East Asian region as a result of the inputs of the RCU, including the following:

- improvement of public awareness
- establishment of training and surveillance programmes that underpin the SEAFMD campaign
- effective coordination of national and regional FMD activities

- high-level national and international liaison with donor agencies and other institutions
- establishment and international recognition of the Regional Reference Laboratory for FMD in Pakchong, Thailand
- maintenance of FMD freedom in Indonesia and OIE recognition of FMD-free zones in central and southern Philippines and western Malaysia
- successful progressive zoning of the eradication of FMD in the Philippines (the Philippines will soon seek national FMD freedom from the OIE)
- establishment of five FMD zones and the mechanisms for their expansion and ultimate amalgamation
- assistance in sourcing funds for member countries for strengthening and implementing their FMD programmes.

These achievements augur well for the future success of the RCU and the SEAFMD campaign in reaching the objective of FMD freedom with vaccination in the region by 2020.

Children caring for goats in Vietnam



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Roadmap strategy

The goal of the roadmap is to provide a long-term strategy to achieve FMD freedom with vaccination by 2020.

The roadmap is an integrated mix of policies and actions, involving progressive zoning, surveillance, emergency planning, vaccine supplies, diagnostic capacity, traceability, training and community awareness. A vital and immediate element is the need for full Ministerial and ASEAN support and funding for the SEAFMD campaign. With the assistance of the RCU, member countries convert strategic directions into operational plans that are customised in accordance with national priorities, but with objective of obtaining sub-regional FMD freedom by 2020. Strategies and national plans are reviewed annually.

Given the limited resources of member countries and geographic considerations, a key strategic element is to control FMD progressively, on a step-by-step approach. Priority areas agreed by member countries are identified for the establishment of control zones. Resources are then mobilised to control FMD in these areas. To complement this strategy, investments to strengthen veterinary services as a whole are necessary. Success is dependent on political and financial support of governments. This commitment is critical if external funding agencies can be expected to provide resources.

Strategic directions

To support the control and eradication of FMD through progressive zoning, the strategic directions described below are defined.

Political support

SEAFMD will falter unless there is strong political support and endorsement at the highest government levels, accompanied by the provision of resources. The RCU will not be able to function in 2008 unless funding is provided.

A number of countries in the SEAFMD campaign have well developed programmes in place and probably have sufficient resources to fund their national activities but may need some support. Others, such as Cambodia, Lao PDR and Myanmar need external funding to undertake a national FMD control and eradication programme.

Priority efforts will be made to gain the necessary support with assistance of the Director General of the OIE. High-level political and policy support will also be sought for the drafting of model legislation in countries where legislation is deficient.

Strengthening veterinary services

In a number of instances, approaches to animal health problems, although often successful, can only be short-term fixes. The key to sustainable prevention, control and management of animal diseases is through investment in animal health systems. Countries with adequate veterinary services will always be at risk from countries with poor or non-existent veterinary services.

Good animal health services are not the only prerequisite to successful transboundary disease prevention and control although they go a long way to achieving these goals. The sharing of information and coordination of activities between countries minimise risks of disease establishment and spread.

The OIE has initiated a major programme, the *Performances Vision and Strategy* scheme, which will seek to evaluate the quality and effectiveness of national veterinary services and identify weaknesses. Evaluations will form the basis for improving deficiencies and, as appropriate, support applications to funding bodies to provide support to correct problems.

Veterinary services cannot develop and operate properly without political endorsement and resources.

Improving international coordination

The effective coordination mechanisms introduced during Phases 1 and 2 need to be consolidated and enhanced.

This will be achieved by encouraging and improving communication between member countries and relevant international organisations and facilitating coordinated activities in not only the control zones but also in the difficult and sensitive border areas.

In recent years, the RCU has sought to work with other international organisations whose work is consistent with SEAFMD objectives. This avoids duplication of efforts and creates complementarities. This work will remain a priority area for the RCU.

Reinforcing animal health control measures

The major points of emphasis will be animal movement controls and more refined surveillance, laboratory diagnostics and reporting activities.

Strategic vaccination approaches will be considered in control zones for a period of three years with the objective of achieving acceptable cattle and buffalo herd immunity levels.

Mobilising stakeholder and public support

Increased emphasis will be placed on public awareness campaigns and the updating and refinement of regional and national communication plans. Given the importance of the private sector in preventing and controlling disease, efforts will be made to build on the SEAFMD initiative to engage industry and strengthen and enlarge the SEAFMD Private Sector Consultative Committee.

Applicability of SEAFMD to disease management

Transboundary diseases such as CSF, Newcastle disease, can be prevented and controlled in a sustainable manner if effective veterinary services are in place and if there is professional coordination of activities. It is strongly suggested that the SEAFMD model be regarded as a fundamental animal health approach to minimise risk.

Roadmap tools

Several essential tools for the action plans to successfully complete the FMD campaign by 2020 are described below.

Risk analysis

Risk analysis comprises hazard identification, hazard characterisation, risk assessment, risk management and risk communication. The general SEAFMD approach is based on a risk analysis framework.

Phase 3 will see greater emphasis on risk assessment which will assist member countries to identify critical areas for focused intervention. This will help them to make sound decisions. It is important to identify the risk factors in the spread of FMD. The most economical and feasible way of managing these risks is to prevent the entry of FMD into the control zones. Risk analysis will be used to aid member countries to develop strategic policies to support effective FMD prevention and control.

Surveillance and epidemiology network

A sound surveillance system is a key tool that provides guidance in the overall disease control strategy. It is the backbone for early detection and response. Surveillance is the method for determining the FMD status of a zone and regular surveillance surveys and prompt follow-up analysis need to be undertaken in order to meet OIE standards for each zone, except of course for the infected zone.

The epidemiology network (EpiNet) will be strengthened to provide the necessary technical inputs to policy decision-making. This tool will strengthen epidemiological skills and the sharing of information in the region. The RCU provides a Web-based information system to display maps and tables of FMD outbreaks. Information systems will be of increasing importance as the SEAFMD campaign progresses to eradication and freedom. Eradication of FMD by 2020 will rely on the improved epidemiological skills mentioned above and EpiNet will provide a mechanism to build quality databases and analysis to guide the campaign.

Surveillance will need to continue until 2020. The demand for surveillance programmes will increase as the zones upgrade and expand and then, once consolidated, decrease to a monitoring profile. Unexpected outbreaks will also make demands on field and laboratory capacity for surveillance. The capacity of surveillance in member states is varied and some upgrading of human resource capacity will be required for countries such as Myanmar, Lao PDR and Cambodia. The structure of the surveillance programmes is well defined in the 'minimum standards' and the criteria to upgrade from one zone to another. The input of an experienced epidemiologist to provide surveillance options, as was the case in the MTM zone, has much merit for other zones.

Diagnosis and laboratory network

The FMD Regional Reference Laboratory (RRL) in Pakchong, Thailand, provides the backbone and sets standards for the considerable laboratory inputs required in the SEAFMD campaign. The RRL has a major task in assisting with quality control of the diagnostic tests and in providing specialist diagnostic tests to back up the campaign. It also provides the link to the World Reference Laboratory.

There will be increasing demands for laboratory testing for surveillance and analysis, diagnosis, FMD virus strain identification and quality control in the region as the SEAFMD intensifies its programme and increases zones. The RRL is the hub for FMD quality control and acts as a regional reference laboratory for national laboratories. Most national laboratories can undertake a range of FMD diagnostic tests and through the network for

laboratory testing are able to ensure agreed quality standards. Through the network, the RRL can provide support to national laboratories during emergencies and resolve any unusual diagnostic problems. This is a powerful tool for the SEAFMD campaign. The network provides the opportunity for member countries to have FMD isolates confirmed and typed.

Vaccination

Vaccination is another key tool in support of FMD control. The quality and availability of vaccine and level of vaccine coverage are critical elements of any vaccination strategy. Vaccines, however, must be effective and correctly selected to protect against the circulating strains, otherwise vaccination policy failures will occur. Even the best vaccines will not protect every animal; 80-90% immunity levels in cattle and buffalo are the norm, but the protection rate is much lower in pigs. This means vaccination strategies will vary and, in some circumstances, vaccination of pigs may not be appropriate.

To reduce the risk of FMD infection and spread, ring vaccination can be implemented in identified high-risk areas in the control zone, based on the outcome of surveillance and risk analysis. It is important to achieve a herd immunity of at least 80% of large ruminants and this can be validated through post-vaccination monitoring using a structured survey and testing with a liquid phase enzyme-linked immunosorbent assay (LP ELISA). The same strategy can be implemented for the eradication zone and FMD-free zone with vaccination.

For countries with inadequate resources where mass vaccination outside the priority zone is not implemented regularly, it is essential to create an emergency vaccine stock to respond to FMD outbreaks. This is to ensure that any impending FMD epizootic can be prevented.

Animal movement management

Animal movement has been considered the predominant cause of FMD outbreaks in all other zones. This is a difficult issue for all member countries. Given the economic value of the livestock trade, there is considerable animal movement in the region. This is an indication of the importance of the livestock sector.

The directions of animal movement fluctuate, reflecting changing economic circumstances in the region. Recourse to legislation, check points, quarantine and the permit system all contribute to the management of animal movement and reduce the risk of FMD spread. However, not all animals are moved legally.

The strategy for more effective control of animal movement is to attempt to reduce costs, improve the efficiency of legal animal movement and encourage traditional movement to conform in part at least to some manner of inspection. Reduced costs and free FMD vaccination for border traders would encourage more legal animal traffic. The range of animal movement management processes needs to be examined annually to identify risks and opportunities for a more efficient system. Traceability using ear tags, brands and ear notches help and are starting to gain momentum. This should be encouraged.

The patterns of animal movement will be of major importance during the next five years. As the zones are upgraded and expand to finally reach FMD-free status by 2020, illegal animal traffic will decrease. The free movement of animals is one of the benefits of FMD freedom for the region.

Emergency preparedness and contingency planning

It is critical that SEAFMD countries implement systems that will rapidly detect disease, report incidents to authorities with the utmost speed and urgency so that action can be taken to quarantine problem farms and areas and prevent the spread of FMD.

Rapid detection and reporting are critical elements in FMD control given the highly infective nature of the disease. A number of major outbreaks of FMD in SEAFMD countries have resulted from failures in these areas.

Countries need to have contingency arrangements to rapidly isolate outbreaks, prevent spread through movement controls, including disinfection, and implement national policies ranging from slaughter to vaccination, combined with communication to the public.

Policies will vary from country to country, depending on disease status, for example, country- or zone-free status and their economic circumstances. However, the principles of rapid detection, reporting and action apply to all situations.

Contingency planning on emergency preparedness activities are key animal health activities. Plans should be fairly simple, capable of implementation and developed by animal health staff so they are not only familiar with the content but 'have ownership' of the ideas. Plans should be tested regularly and updated as necessary.

Emergencies are in the main unpredictable and staff re-deployment from normal day-to-day work may be necessary to control the problem. Policies and procedures to support emergency responses, such as contingency funding arrangements and vaccines banks will be encouraged.

Legislation

All member countries have legislation that addresses disease control. However, in the light of experience within and beyond the region, some legislation will need to be updated to provide a more effective tool for the SEAFMD campaign. Compensation strategies will be necessary if partial or full stamping-out exercises are undertaken in eradication and free zones. Legislation that cannot be applied or enforced greatly weakens this important tool.

Public awareness and communications

Public awareness and communications require all the support and tools available because good communication plays an essential role in achieving a successful outcome. The expansion of the communications network created by the RCU will provide a useful tool for engaging the public and private sectors in the progress of the SEAFMD campaign. The RCU is the focal point of the network and can assemble 'packages of information' on the SEAFMD website, thereby enhancing the global network and communications of member countries throughout the SEAFMD campaign. Emergency plans, with regular practice runs in communications, should be established in all member countries, including FMD-free members.

Throughout the SEAFMD campaign, a strong and active public awareness programme from today to the end of 2020 and possibly beyond is essential. Experience from the Philippines will assist in building up the programme. Targeted public awareness communications to a wide range of stakeholders in the public and private sectors will be needed, using all forms of media.

Standards, definitions and rules

Clear, achievable sets of defined systems and activities are powerful tools that are essential for an integrated SEAFMD campaign. The campaign has established a working set of minimum standards, definitions and rules (SDR) for zoning that are practical and clearly define what needs to be done. The surveillance standards and criteria to upgrade from one zone to another are described. These standards are the benchmarks of the SEAFMD campaign and provide good guidelines for the FMD control and eradication programme.

Training

Training will upgrade the human resources for the SEAFMD campaign and is another essential tool for the successful outcome of the SEAFMD campaign by 2020. Substantial training has been planned and provided by RCU/SEAFMD, with support from other agencies such as the FAO, JICA, EU and OIE. Between 2008 and 2020, training requirements will evolve as progress is made in the campaign. In addition to a lack of funds, one factor that may hinder training is the lack of available candidates for training in some member countries. In addition, competition from other duties, such as HPAI, limits the application of the training acquired. All components of the strategy need training inputs.

Roadmap timetable

SEAFMD 2020 will comprise three main phases, based mainly on the progression in attaining FMD freedom in the different zones. Most activities are the continuation and, to some extent refinements, of the existing programme.

Consolidation: Phase 3 (2006-2010)

Phase 3 will focus of gaining ground on the identified control zones in mainland South-East Asia. One critical aspect is the progression from control to eradication zones. Implementation of roadmap tools, such as risk analysis, surveillance, vaccination, animal movement management, public awareness, among others, will be strengthened to effectively control FMD in these zones and reduce FMD outbreaks outside these zones. The Philippines is expected to gain OIE recognition as a FMD-free country by 2008.

A critical target in Phase 3 is the development of emergency preparedness and contingency plans at regional and national levels. This step will include the establishment of special funds and resources, including a vaccine bank, to be mobilised in case of an emergency and to prevent FMD epizootics.

Expansion: Phase 4 (2011-2015)

Based on the success in controlling FMD in the first set of control zones, Phase 4 will aim to expand the control and eradication zones, either through expansion of areas contiguous to the existing zones or the creation of separate control zones. Implementation of roadmap tools will be further refined and, to some extent, new tools maybe developed to support the needs of the campaign. It is expected that some of the original zones in Phase 3 will be declared free zones with vaccination. The crucial work here is how to sustain FMD freedom in these zones. The management of animal movement has to be strengthened further to prevent incursion of FMD into these zones. Furthermore, the aspect of emergency preparedness and contingency planning will play a critical role in the immediate control of an FMD outbreak and in the prevention of spread to free zones.

Finalisation and maintenance: Phase 5 (2016-2020)

During the first half of Phase 5, it is expected that significant areas of mainland South-East Asia will have been declared FMD-free with vaccination. The greatest challenge during this stage will be to locate, isolate and control residual FMD infection. This is one of the most difficult aspects of disease eradication. A vastly improved surveillance system, which will have been built through the years of the campaign, will prove essential in the identification of foci of infection and eradication of the disease at its source. Towards the latter part of Phase 5, the activities will be mainly focus on the maintenance of the sub-region as FMD-free with vaccination. Another challenge at this stage will be to prevent FMD incursion from neighbouring countries. It is important that continuous engagement of neighbouring countries should go hand-in-hand while controlling FMD on the South-East Asia mainland.

Appendix 2 provides details of the timetable of activities.

Veterinary quarantine officers inspecting cattle for trade in Songkla, Thailand



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The foot and mouth disease zones in South-East Asia

Zoning is an approach aimed at defining geographic areas of different animal health status within a country or region for the purpose of disease control and eradication and international trade. Zones are clearly defined areas that are declared by legislative or administrative action of the respective countries to facilitate movements within zones, control movements between zones and to enable the control, eradication and exclusion of FMD.

Zone status includes infected zones, control zones, eradication zones, free zones with vaccination, free zones without vaccination and buffer/surveillance zones. There will be progression of the control zone to eradication zone, to free zone with vaccination, to free zone without vaccination if the rules for progression of zones are applied and the health status improves.

Six zones have been identified by member countries as priority areas for prevention, control and eradication of FMD. The idea is to control FMD in these zones first, progressively eliminate the disease until the area is considered free and then, slowly expand the zones outwards. When considered appropriate, new zones will be defined.

The six priority zones are listed below.

Malaysia-Thailand-Myanmar zone (MTM)

The MTM zone was the first zone identified in mainland South-East Asia. The initial control zone comprises of Peninsular Malaysia, regions 8 and 9 of Thailand and the Kawtaung and Myeik Townships in the Tanintharyi Division of Myanmar. The buffer zones comprise the provinces of region 7 in Thailand and the northern townships of Tanintharyi Division in Myanmar. It provides an excellent model for the other zones.

Upper Mekong zone (UMZ)

This zone consists of northern Lao PDR, Myanmar, northern Vietnam, the southern part of Yunnan Province, People's Republic of China and north-east Thailand and is centred on the upper reaches of the Mekong Basin.

Lower Mekong (LMZ) zone

This zone consists mainly of southeast Cambodia and southern Vietnam and is located on the lower reaches of the Mekong. Region 2 of Thailand and the southern part of Lao PDR are part of the zone. Although they are not yet contiguous to the main zone, it is expected that as the zone progresses this will coalesce into one.

Philippines foot and mouth disease-free zone

The Philippines is completing a national FMD eradication campaign and is now on the verge of declaring FMD-free status. No FMD outbreak has occurred since January 2006. The Philippines will seek OIE recognition in 2008 for FMD-free status. All the components for the eradication campaign are in place, including emergency plans, epidemiological investigations, public awareness and laboratory testing procedures.

Red River Delta zone of Vietnam

The Red River Delta zone comprises two provinces of Nam Dinh and Thai Binh. Overall, activities in this small zone are similar to those of the Upper Mekong zone. As it is smaller and surrounded by the Upper Mekong zone, it is likely that it will achieve FMD freedom with vaccination in 2010.

Myanmar zones (MYZ)

Apart from the two zones in Myanmar included in the MTM and Upper Mekong, two other zones are involved: the Sagaing zone in central Myanmar and the Rakhine zone in the west. These two zones are relatively new and are considered a source of FMD infection. Considerable efforts are now being devoted to determining the risks, controlling animal movement and introducing surveillance strategies for FMD in the two zones.

Upgrading and expansion of foot and mouth disease-free zones

This is the major pathway for reaching the targets for FMD freedom with vaccination in 2020.

SEAFMD has a functional set of minimum SDR and a surveillance strategy, originally based on the MTM zone, which are applicable to all declared zones. The stepping stones and mechanism for declaration of progress from control to eradication to free zones are well defined. Each member country will need to follow the prescribed surveillance and minimum SDR so that in two to three years the country should have the capacity to upgrade each zone and expand the buffer, control and eradication zones.

To achieve these milestones, a prepared plan of action is needed to accommodate any unforeseen outbreaks, such as an emergency action plan for each member country, which could be supported by the RCU. The RCU will consider establishing an emergency trust fund for essential supplies, such as vaccines and epidemiological inputs, so that it can assist member countries promptly to contain and eradicate FMD outbreaks in the eradication and free zones.

It is important that all FMD outbreaks are evaluated in epidemiological terms in order to gain from the 'lessons learned' for the benefit of all members of SEAFMD. The supply of vaccine and the ratification of the legal basis for the emergency action plans need to be in place.

Every two or three years, member countries in the current six zones need to actively plan and undertake a rolling expansion and upgrading of buffer, control, eradication and FMD-free zones to reach the goal of FMD-free status with vaccination by 2020.

Each country will progress at a different rhythm to attain FMD freedom. It is likely that Malaysia will follow the Philippines in obtaining certification of national freedom.

Progressive zoning scenarios are shown in Appendix 3 and maps on zone progression are shown in Appendix 4.

Maintenance of foot and mouth disease-free status

The past achievements of member states and the SEAFMD have resulted in significant progress in attaining FMD-free status. Indonesia is free from FMD, as is east Malaysia and most of the Philippines except Luzon.

A major platform of the roadmap is to ensure the maintenance of status of FMD-free countries and zones. This will be achieved by surveillance and analysis of results to prove freedom of disease, effective public awareness, annual risk assessments of FMD outbreaks, the establishment of an emergency FMD task force, continuous updating of legislation to facilitate FMD-free status and rigorous controls of animal movements into FMD-free zones.

This vigilance will also help the FMD-free countries, such as Indonesia and parts of the Philippines and Malaysia, to retain their status. To support the public awareness programme in FMD-free areas, the economic benefits of freedom from FMD need to be widely publicised, as do the economic and social costs of a permanent breakdown of FMD-free status. It is expected that the current FMD-free areas will remain free until 2020 and contribute to the other member countries through consolidation of the socio-economic benefits of FMD freedom in the region.

'Super Pig' campaigns for FMD-free Philippines in a wet market, Luzon Island



© Nichola Hungerford

Buffalo herd in Vietnam



© Stéphane Forman

Current institutional arrangements for the SEAFMD reflect the fact that it is an OIE programme and works in close cooperation with member countries, international organisations and donor bodies.

The SEAFMD will be closely linked with the FAO/OIE Global Framework for the control of transboundary animal diseases (GF-TADs) and will participate fully in its future activities. The Regional Steering Committee of GF-TADs for Asia has recognised the leading role of SEAFMD in the control of FMD in the ASEAN sub-region.

Overall guidance, policy development and review are provided by the OIE Sub-Commission for FMD in South-East Asia chaired by the OIE with membership comprising member countries, ASEAN, FAO and donor organisations that provide significant annual contributions to the programme. The executive guidance of the Sub-Commission is managed by a Steering Committee comprising the President and Vice-Presidents of the OIE Sub-Commission, OIE Regional Representation, ASEAN Secretariat, FAO and donor agencies.

The Sub-Commission meets annually in a number of countries and prepares a report which is considered and ratified if agreed by the OIE International Committee in May each year.

Appendix 5 lists these arrangements and Appendix 6 provides the Terms of Reference for the Sub-Commission and Steering Committee.

The success of the SEAFMD campaign is dependent on good cooperation between its members, funding from AusAID and the quality of professional staff. Institutional management will be further refined in Phase 3.

OIE

The OIE will continue to play the leading role by providing scientific and policy input to ensure the success of the SEAFMD programme. The OIE will continue to chair the OIE Sub-Commission for FMD with the Chair nominated by OIE Director General. This will normally be the OIE Regional President for Asia, the Far East and Oceania, who will also Chair the Steering Committee which is comprised of the OIE, FAO, ASEAN and representatives of members and donors.

The OIE will harness the benefits from other regional FMD and transboundary disease control programmes on a global scale and will help secure funds for the programme.

ASEAN

The objective of Phase 3 is the increased involvement of ASEAN in SEAFMD activities. This move is aimed at facilitating the sustainability of the SEAFMD campaign. It is proposed that ASEAN will, *inter alia*, manage and be accountable for funds in the ASEAN Animal Health Trust Fund. ASEAN will also be involved in developing policy and in the operation of the RCU located in Bangkok and supported by the DLD.

FAO

The FAO will continue to partner the OIE in providing technical assistance and helping to mobilise resources to meet the SEAFMD objectives. The FAO will continue to be an active member of the Sub-Commission and the Steering Committee. It will provide information and advice on the development of FAO activities which may have an impact on FMD control. This will be made possible as most of the SEAFMD member countries have an FAO country office.

Member countries

All member countries will be responsible for their roles in the SEAFMD campaign and for developing national FMD programmes based on strategic directions. The RCU is assisting in the preparation of the national programmes which will be updated and completed in 2007. Each country has different target dates for FMD freedom.

All member countries will need to review their human and financial resource allocations up to 2010 and projections to 2020, as some countries have limited resources. A long-term funding perspective is essential. Each national FMD plan will be reviewed on an annual basis as progress occurs. In some cases, the RCU will assist member countries and, member countries on their own initiative can assist those countries with less resources.

Regional Coordination Unit

The RCU is the lynch pin for SEAFMD coordination, monitoring and evaluation of progress on a regional scale. The RCU will support member countries and have a critical role in the coordination of progressive zoning activities. It will provide a reservoir of skills, knowledge and data banks on FMD and also link member countries, where necessary, to the regional information systems.

Private sector

The Sub-Commission has established a Private Sector Consultative Committee (PSCC) which suggests improvements to FMD control at the regional level and, to some extent, provides resources for the programme. The PSCC is chaired by industry. It anticipated that the role and membership of the PSCC will expand.

Funding bodies

Funding bodies contributing at least US\$150 000 per annum can become members of the Sub-Commission as their support and guidance are deemed necessary.

The financial arrangements for the SEAFMD campaign are based on funding the RCU and member states. Together with other donors, AusAID has supported the RCU since its inception in 1997. Member countries have received some funding from multilateral and bilateral donors such as the ADB/FAO GMS TADs project, the France Surveillance project for Upper and Lower Mekong, New Zealand in Red River Delta in Vietnam, ACIAR project in Lao PDR, AusAID/Sanitary/Phytosanitary Capacity Building (SPSCB) project for MTM zone and AusAID/FAO in the Philippines. Member countries, with the assistance of ASEAN, OIE and the RCU, will need additional long-term funding for the successful completion of the SEAFMD campaign. In some cases, given the excellent model of the RCU, some funding can be gained by linking the control and eradication of other diseases, such as CSF and HPAI as was the case in the Lower Mekong zone.

The RCU will require US\$600 000 a year to operate as a coordinating and monitoring agency and to supply the necessary skills, training and information. RCU funding ends in December 2007 and resources will need to be provided from external sources to enable its continuation.

Buying and selling cattle at a market in Myanmar



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Status of foot and mouth disease in South-East Asia

Introduction

The SEAFMD Campaign arose from the recognition that FMD was the most important regional animal health and development issue, given its capacity to spread across international boundaries. On the request of participating countries, the OIE Sub-Commission for the Control of FMD in South-East Asia was formed. The seven founding members of the Sub-Commission are Cambodia, Lao PDR, Malaysia, Myanmar, the Philippines, Thailand and Vietnam. Indonesia is a free zone for FMD but joined because of concerns about the potential reintroduction of the disease. All members belong to ASEAN.

Foot and mouth disease status

When the campaign was launched in 1997, it was only Indonesia that was recognised by OIE as FMD-free country without vaccination. In Phase 1, the Philippines has made good progress with their FMD eradication programme and has obtained OIE recognition for the islands of Mindanao, Visayas, Palawan and Masbate as FMD-free zones without vaccination. In Phase 2, the OIE approved east Malaysia (Sabah and Sarawak) as a free zone for FMD without vaccination.

The FMD serotypes present in the region are O, A and Asia 1 (Table I). Serotype C was reported only in the Philippines and was last detected in 1995. Serotype O is the most common strain in the region and there are several topotypes present. These include the South-East Asia, the Pan-Asia and the Cathay (pig-adapted strain). The South-East Asia topotype, which could be considered an indigenous strain in the region, is present in all countries except the Philippines. The Pan-Asia topotype was probably introduced into the region in the late 1990s and has been confirmed in Cambodia (2000), Lao PDR (2000), Malaysia (2000), Myanmar (1999), Thailand (1999) and Vietnam (2002). The years indicated may not give the exact date of the outbreak because the country's submission of samples to Pirbright World Reference Laboratory (WRL) varies. The pig-adapted serotype O was detected in the Philippines in 1995 and in Vietnam in 1997.

Table 1
Distribution of foot and mouth disease serotypes

Country	2001	2002	2003	2004	2005	2006
Cambodia	Unknown	Unknown	Unknown	Unknown	Unknown	O, A
Indonesia	FMD-free	FMD-free	FMD-free	FMD-free	FMD-free	FMD-free
Lao PDR	O	O	O, A	O	O	O, A
Malaysia	O	O	O, A	O, A	O, A	O, A
Myanmar	O, Asia 1	O	O	O	O, Asia 1	O
Philippines	O	O	O	O	O	No outbreak
Thailand	O, A	O, A	O, A	O, A	O, A	O, A
Vietnam	O	O	O	O, A	O, A, Asia 1	O, A, Asia 1

Serotype A has been consistently present in Thailand. In 2003, a relative increase in serotype A outbreaks was recorded in Thailand and it spread to Lao PDR and Malaysia. In August 2004, Vietnam experienced its first epidemic of serotype A in the southern provinces, which could be due to cattle movements from neighbouring countries.

Myanmar, which is the main source of cattle moving around the region, has not reported the presence of serotype A

Asia 1 has not been very active in the region for quite some time; it was last detected in Cambodia in 1997, Lao PDR in 1999, Malaysia in 1999, Myanmar in 2001, Thailand in 1998 and Vietnam in 1992. In August 2005, an outbreak of Asia 1 was reported in Kayah State, Myanmar. Based on nucleotide sequencing by the FMD Regional Reference Laboratory in Pakchong, Thailand, the recent Asia 1 isolate is closely related to the Thai 1998 virus. This means that this outbreak could be a recurrence of an indigenous Asia 1 strain in Myanmar that could have hibernated for almost four years. The central and northern areas of Vietnam were also affected with Asia 1 in 2005.

In Lao PDR, serotype O is the predominant strain, but an incursion of serotype A was reported in late 2003 and controlled in January 2004. Similarly, most outbreaks in Malaysia were due to serotype O, but an incursion of serotype A was observed in 2003 which continues to recur until 2007. In Myanmar, serotype O is the main serotype, but Asia 1 was once diagnosed in 2001 and recurred in August 2005. In the Philippines, only serotype O (Cathay toptotype) has been diagnosed. In Thailand, the majority of outbreaks were due to serotype O, but as of 2002, an increase in serotype A outbreaks was reported (90.7% of the total serotype A outbreaks in the region). Serotype O is also the strain that causes most outbreaks in Vietnam, but in August 2004 serotype A was diagnosed for the first time and it caused most of the outbreaks that year. In Cambodia, no sample was tested in the laboratory during this period, hence no information is available on the circulating serotype. Prior to 2001, a few samples were sent to Pirbright WRL which explains why the presence of serotypes O and Asia 1 were reported at that time in Cambodia.

Risk factors

SEAFMD member countries reported varied reasons on the origins of each outbreak and the possible factors involved in transmission. For Cambodia and Lao PDR, the sources of outbreaks are unknown. In Malaysia and Vietnam the cause was mainly illegal movements of animals, while in Myanmar infected grazing/watering areas were incriminated. In the Philippines, sources of outbreaks are mainly due to fomites and, for Thailand, animal movements.

It is obvious to correlate the distribution of FMD outbreaks to animal movement patterns. The clustering of outbreaks in the south of Thailand and northern part of Malaysia follows the flow of cattle movements, particularly during the months of October to December when the demand for cattle is high in Malaysia. The clustering of outbreaks in the south of Cambodia and Vietnam also follows the flow of cattle movements.

Cambodia, Myanmar and the Philippines showed a significant increase of outbreaks in the months of June, July and August. For Thailand, a slight increase is observed in November and December and for Vietnam the increase is recorded in February. For Lao PDR no seasonal pattern was observed although a significant increase in the number of outbreaks was noted

in January 2000, July 2001 and November 2003 to January 2004. No pattern was observed in Malaysia but there were four significant peaks in the epidemic curve, namely: July 2001, January 2002, November 2003 and October 2004.

Conclusion

A clear picture emerges of the temporal and spatial distribution of the disease and identified risk factors involved in the spread of the disease. Animal movements, either legal or illegal, are the main risk factor attributed to the spread of FMD. Through the work of the different working groups and field interviews conducted by RCU staff, animal movement patterns are better understood now compared to five years ago. Obviously, animal movements follow livestock price gradients, hence areas with higher prices are at greater risk of being infected. One of the classic examples is the introduction of serotype A to Vietnam in August 2004. When the price of cattle in southern Vietnam increased in 2004, it attracted traders from all over the region to sell their animals to Vietnam. Since Vietnam at that time did not legally accept cattle from any country in South-East Asia, traders smuggled through along the Vietnam-Cambodia border. The result was the introduction of a new serotype A, the first the history of FMD in Vietnam.

A farmer trying to sell his cattle in Mandalay, Myanmar



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Appendix 2

Timetable of activities

Activities	2008-2010	2011-2015	2016-2020
Memorandums of understanding agreed	Yes	Yes	Yes
Surveillance systems in place	Yes	Yes	Yes
Isolation and typing of FMD virus from outbreaks	60% of outbreaks	80% of outbreaks	100% of outbreaks
Epidemiological analysis of outbreaks	60% of outbreaks	80% of outbreaks	100% of outbreaks
Public awareness systems in place	Yes	Yes	Yes
Emergency plans in place	Yes	Yes	Yes
Vaccine supply, including the setting up of vaccine bank	Yes	Yes	Yes
Risk assessment	Yes	Yes	Yes
Animal movement management	Important within the region Conduct studies to determine what 'drives' animal movements and recommend measures to manage this effectively	Strengthen animal movement management within region and along borders with neighbouring countries	Decreasing importance within region, but critical with neighbouring countries Strengthen animal movement management along borders with neighbouring countries
Legislation	Review legislation and policies relevant to the control of FMD and other diseases on a member country basis and on a regional basis. Establish legislation that will empower veterinary services to implement regulatory measures	Continue to strengthen legislation	Update legislation in accordance with the needs of the situation as countries become FMD-free
Zone progression to expand the zones	Buffer zone to increase by 30% Control zone to increase by 25% Eradication zone to increase by 20% Free zone to increase by 20%	Buffer zone to increase by 30% Control zone to increase by 25% Eradication zone to increase by 25% Free zone to increase by 50%	No buffer zone No control zone No eradication zone Free zone 100% with vaccination

Cattle shed in Kanchanaburi, Thailand



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Appendix 3

Zone progression table

Progression of foot and mouth disease status of member countries of the SEAFMD campaign 2007-2020

Country	2007	2010	2015	2020
Cambodia	FMD endemic	Sporadic	50% free with vaccination	100% free with vaccination
Thailand	FMD endemic	MTM zone free with vaccination	60% free with vaccination	100% free with vaccination
Lao PDR	FMD sporadic	20% free with vaccination	50% free with vaccination	100% free with vaccination
Malaysia	FMD sporadic	100% free with vaccination	100% free with vaccination	100% free without vaccination
Philippines	FMD-free zones with vaccination	100% free without vaccination	100% free without vaccination	100% free without vaccination
Myanmar	FMD endemic	20% free	50% free with vaccination	100% free with vaccination
Vietnam	FMD endemic	5% free Red River Delta zone free with vaccination	50% free with vaccination with expanded UMZ and LMZ	100% free with vaccination
Indonesia	100% free with no vaccination	100% free without vaccination	100% free without vaccination	100% free without vaccination

UMZ Upper Mekong zone

LMZ Lower Mekong zone

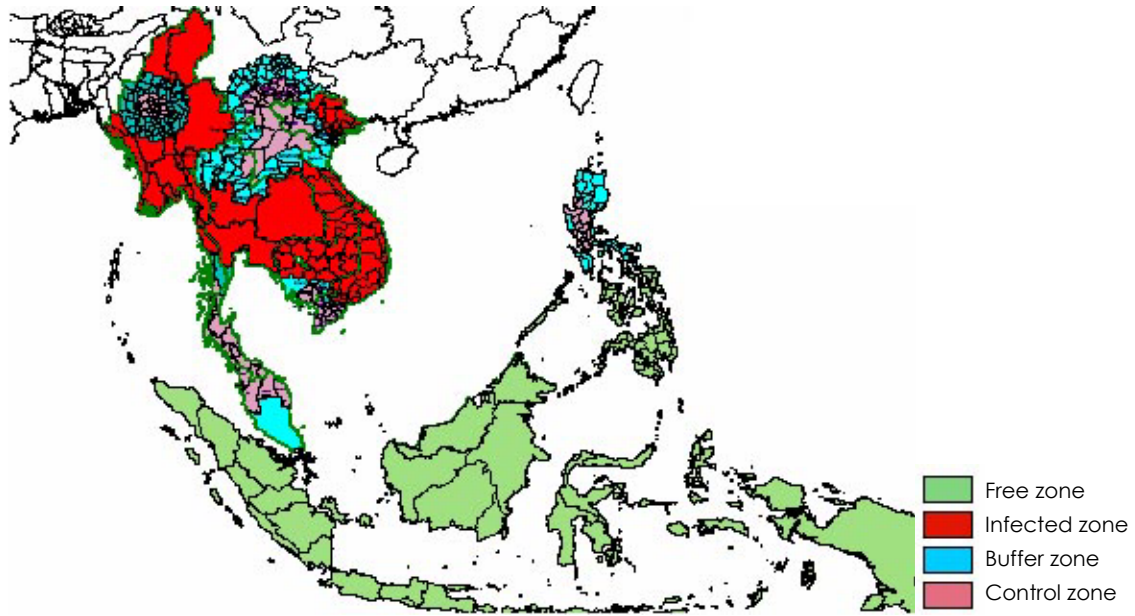
Children bathing buffalo in Vietnam



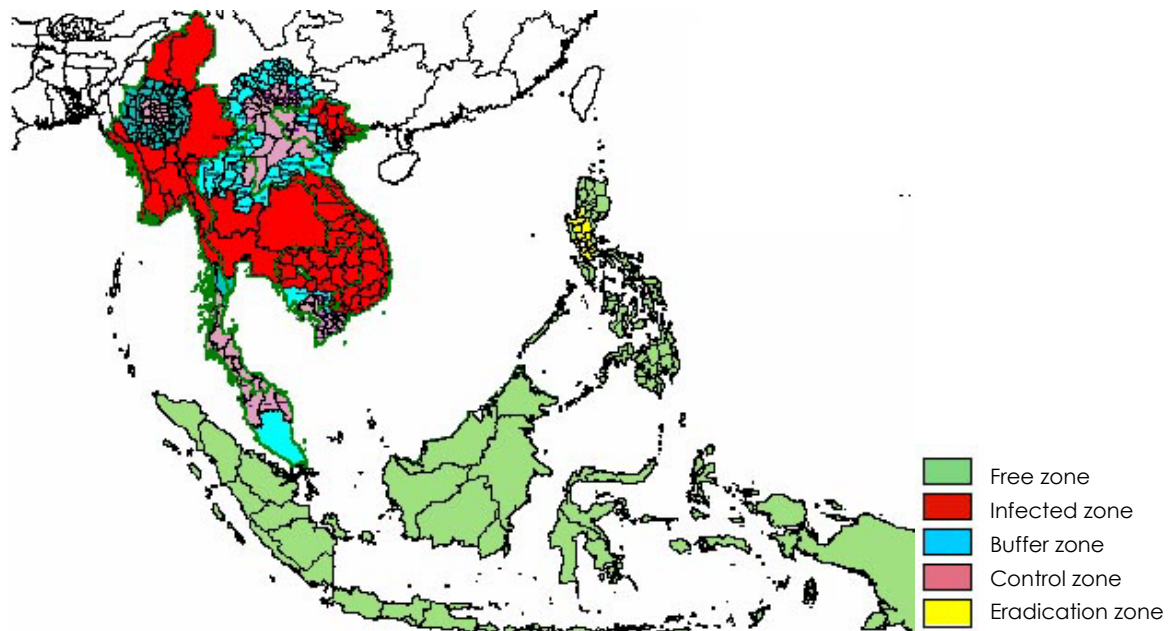
© Stéphane Forman

Zone progression maps

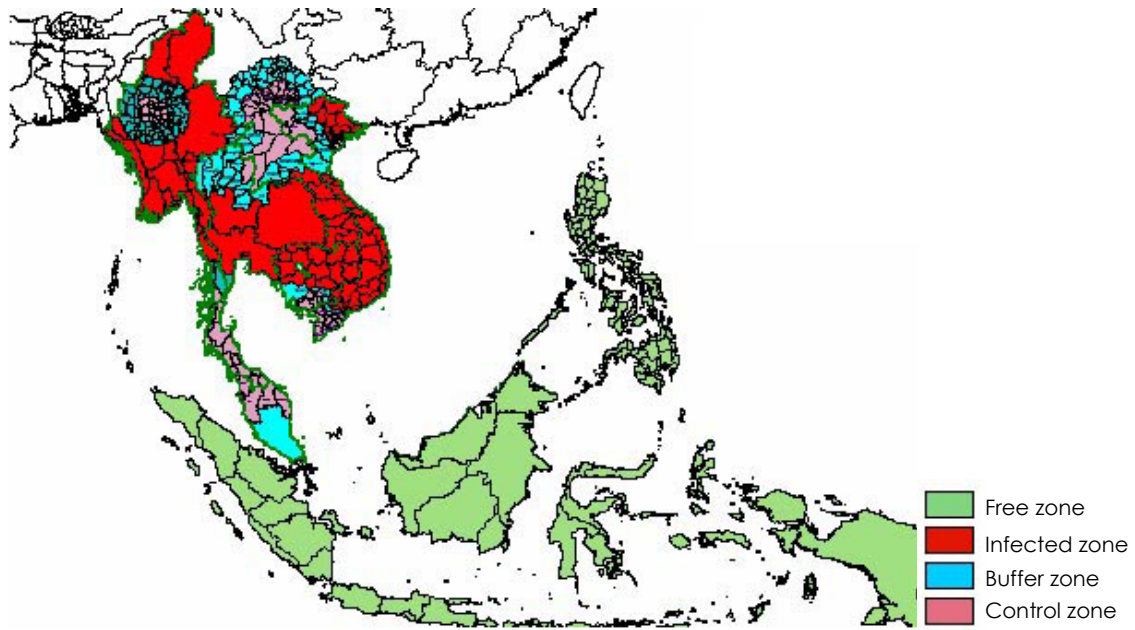
SEAFMD 2005



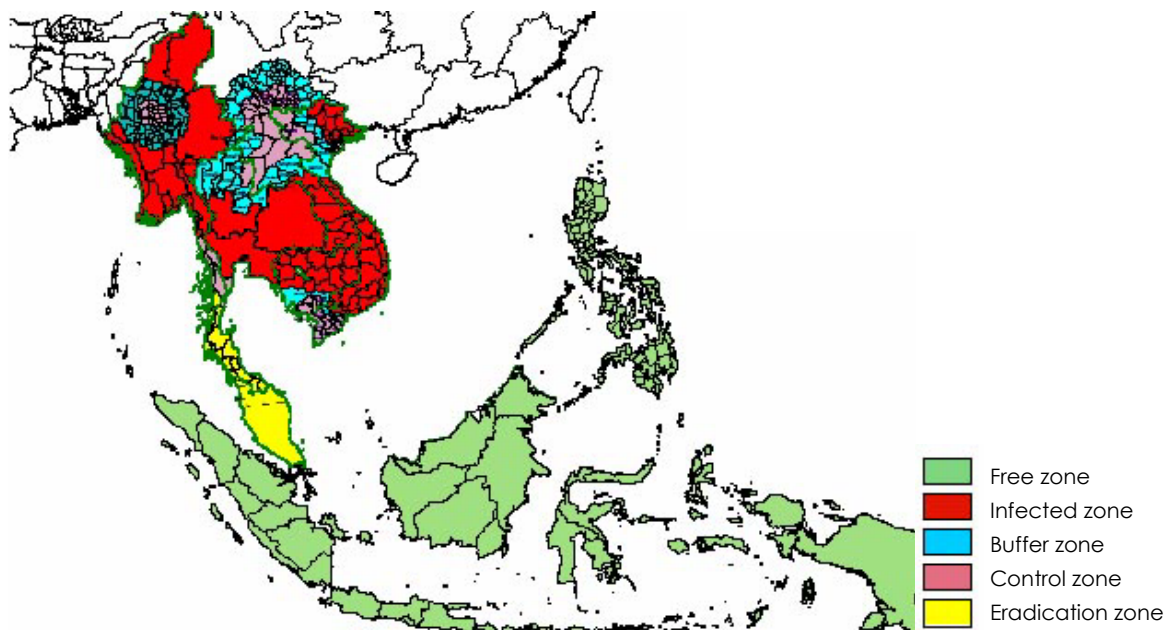
SEAFMD 2006



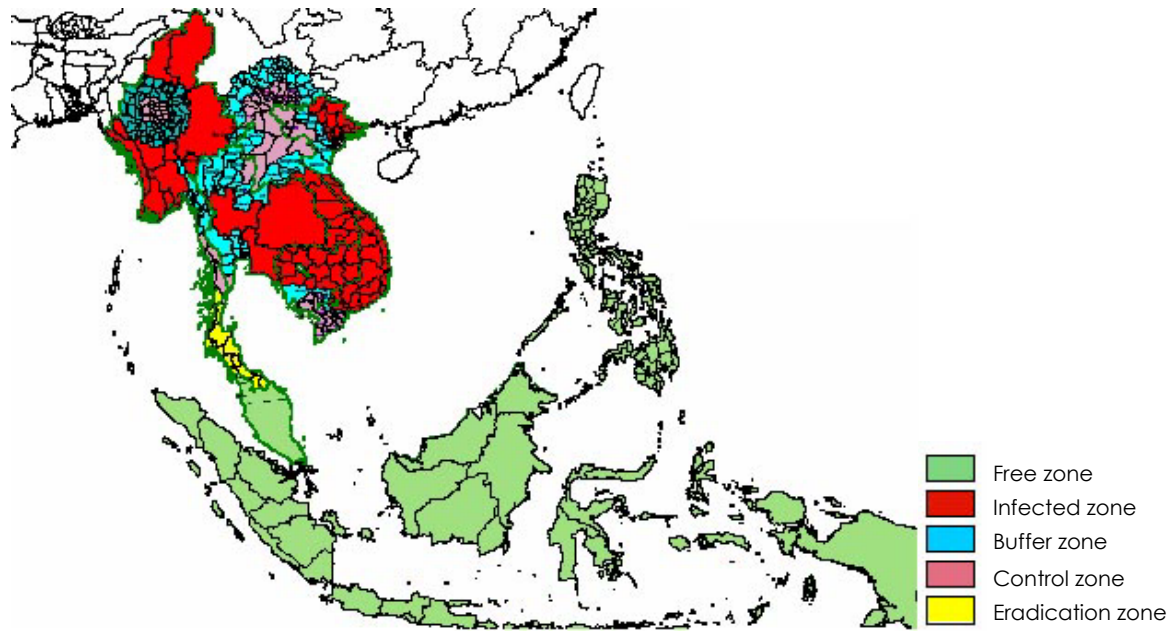
SEAFMD 2008



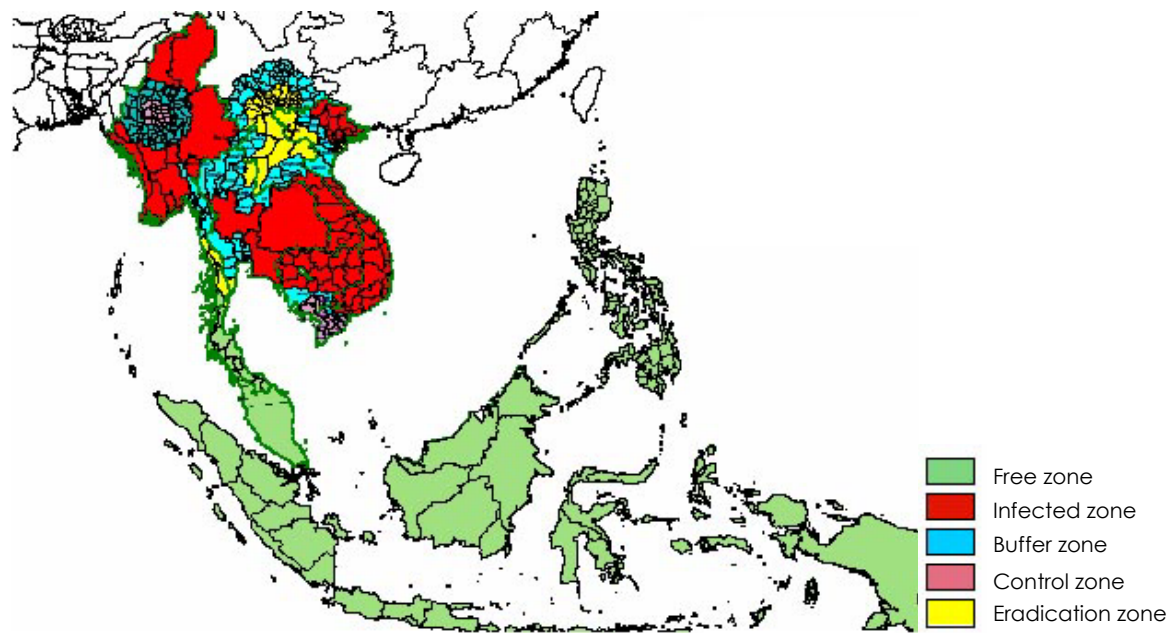
SEAFMD 2009



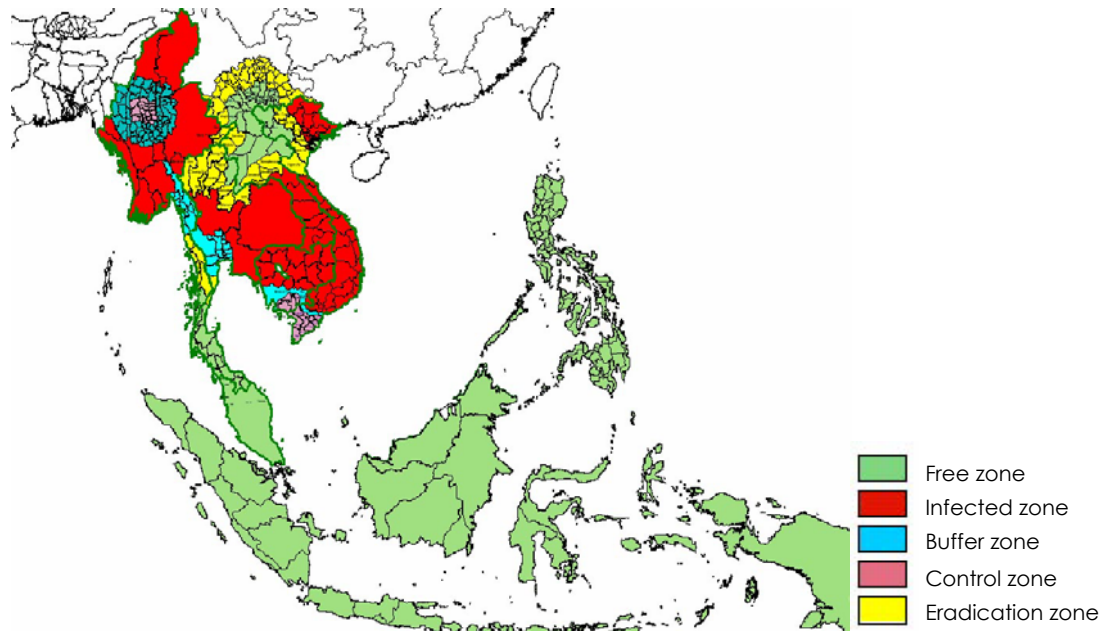
SEAFMD 2010



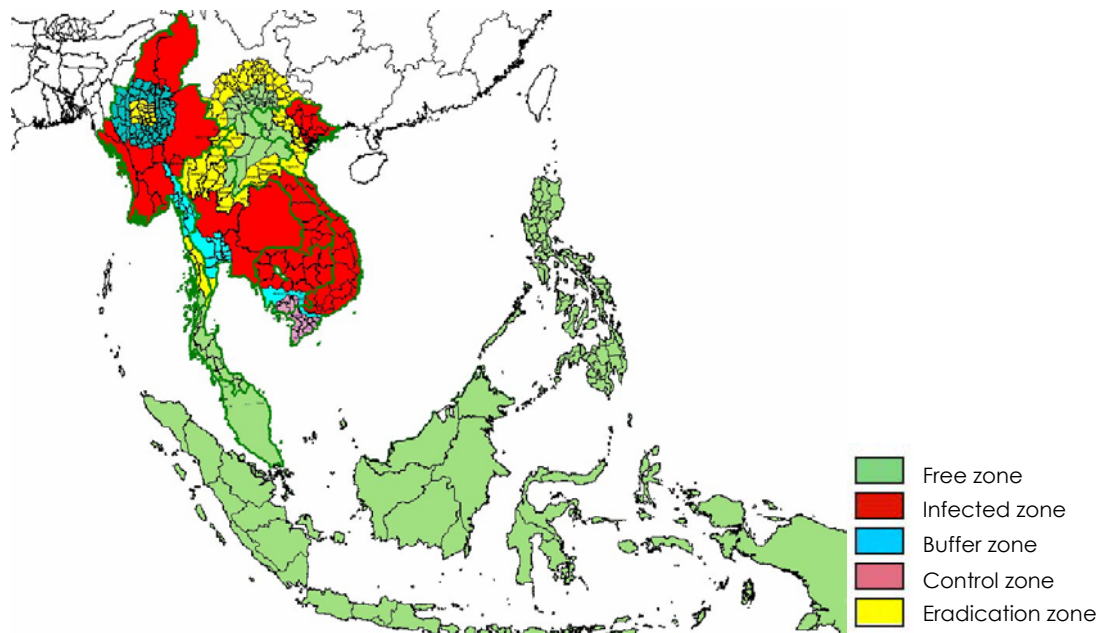
SEAFMD 2012



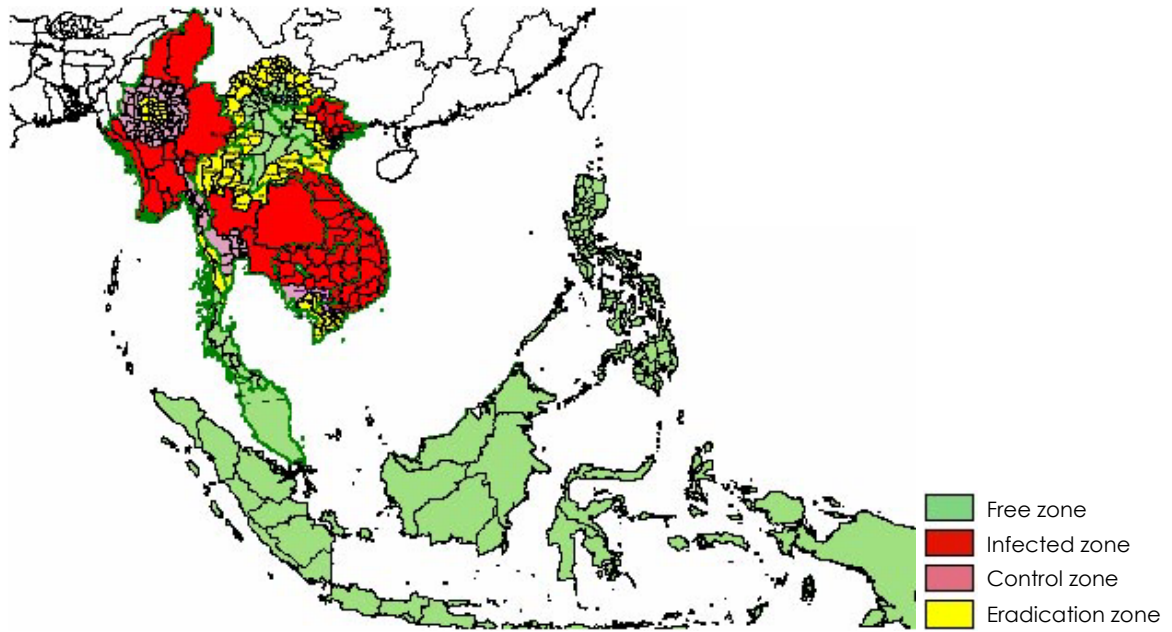
SEAFMD 2013



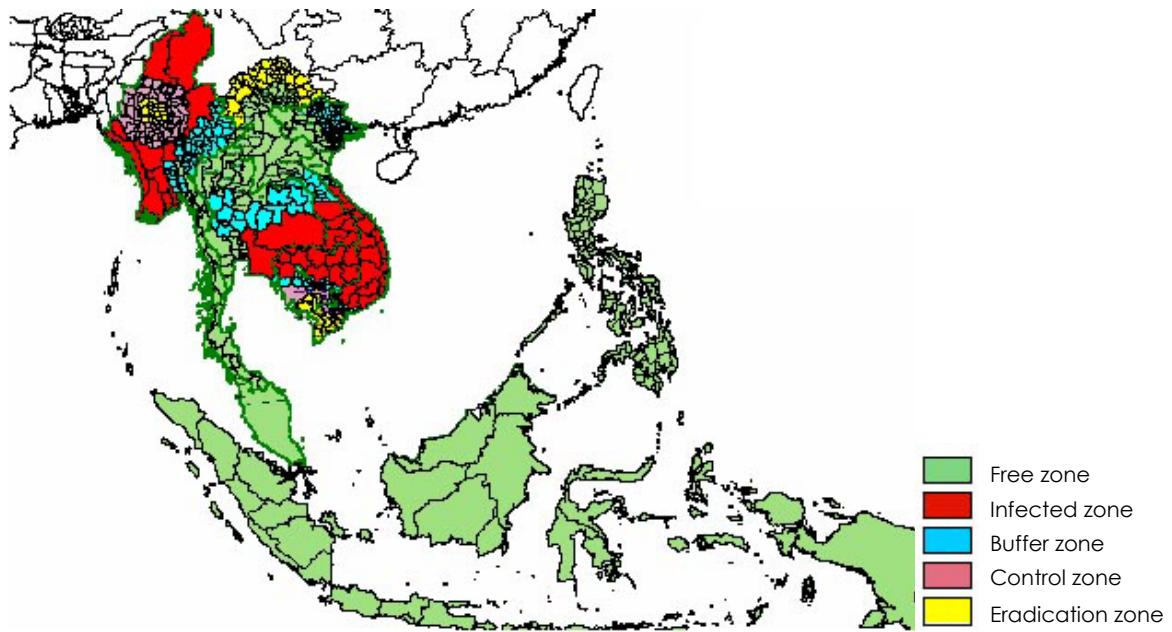
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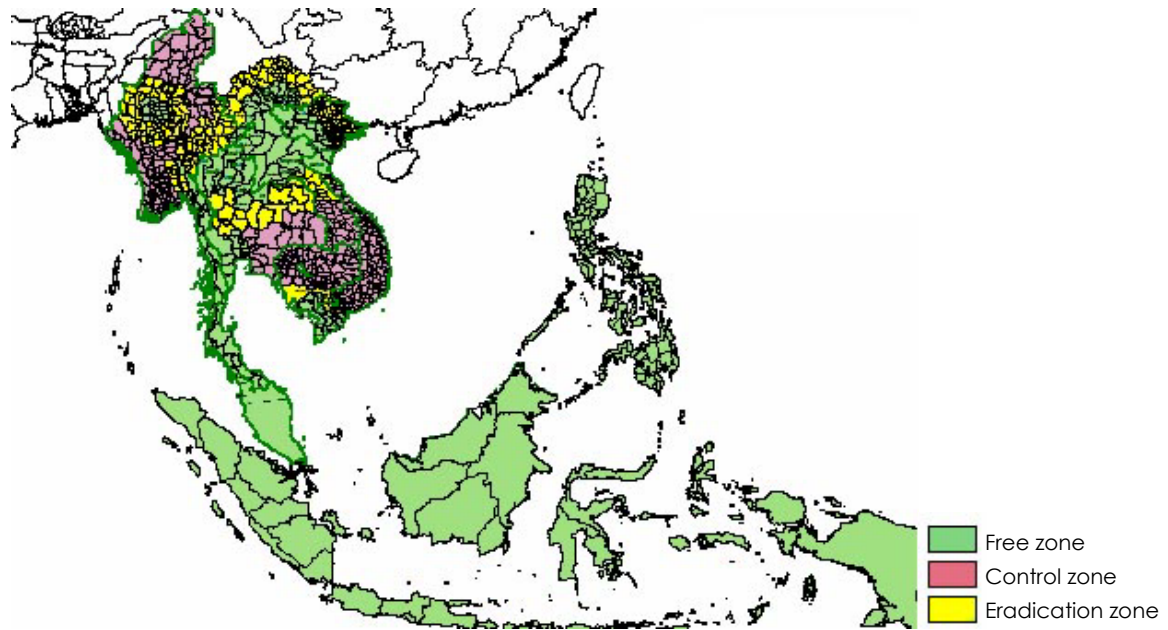
SEAFMD 2015



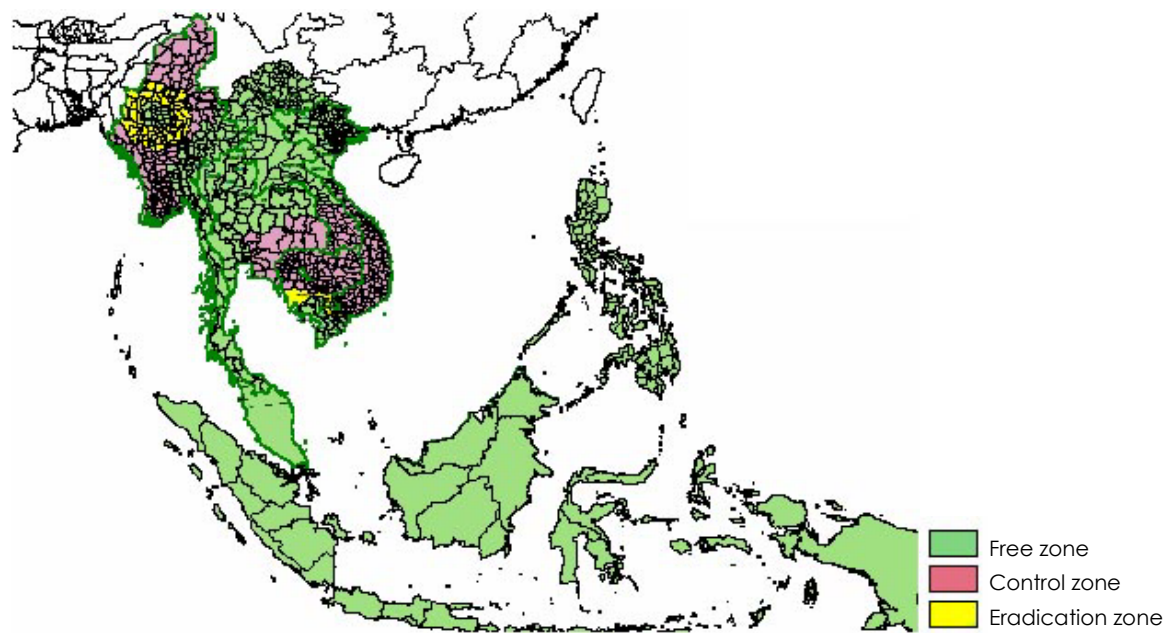
SEAFMD 2016



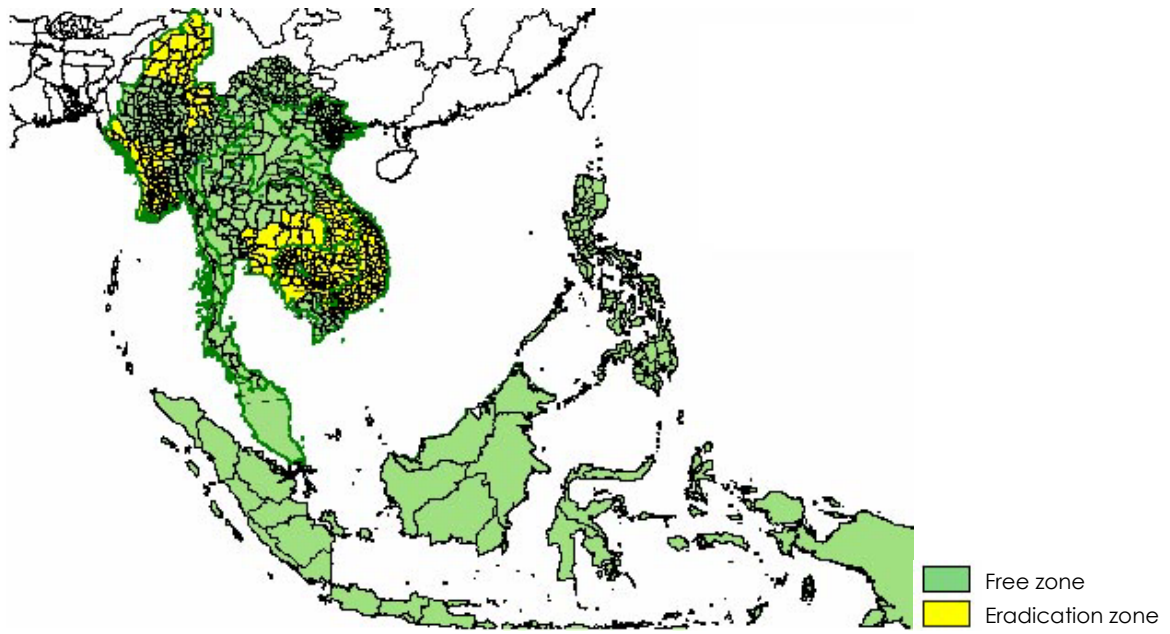
SEAFMD 2017



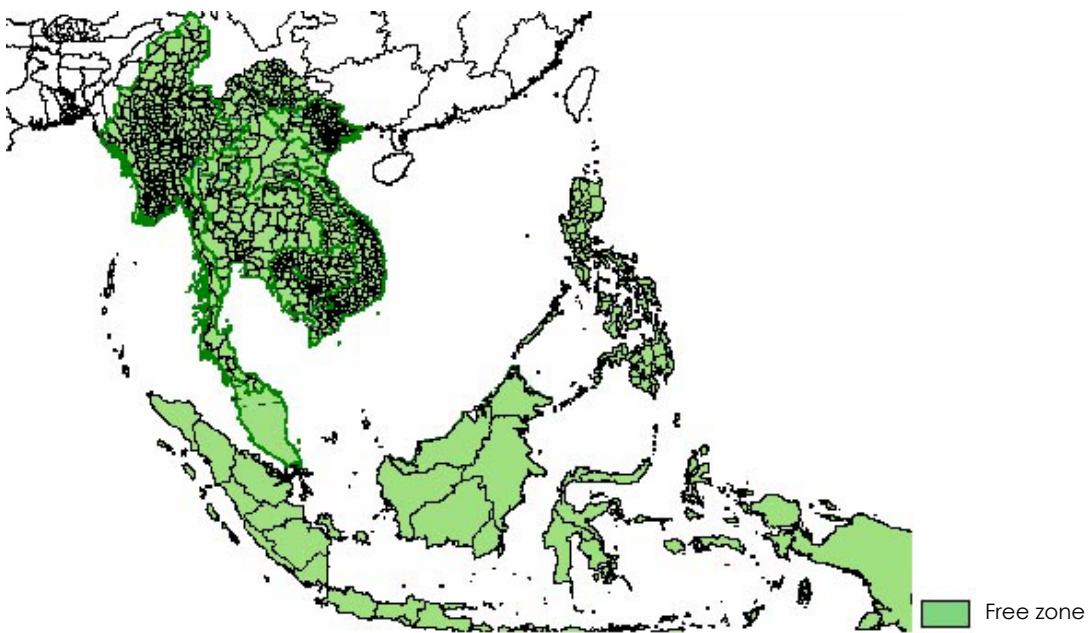
SEAFMD 2018



SEAFMD 2019



SEAFMD 2020

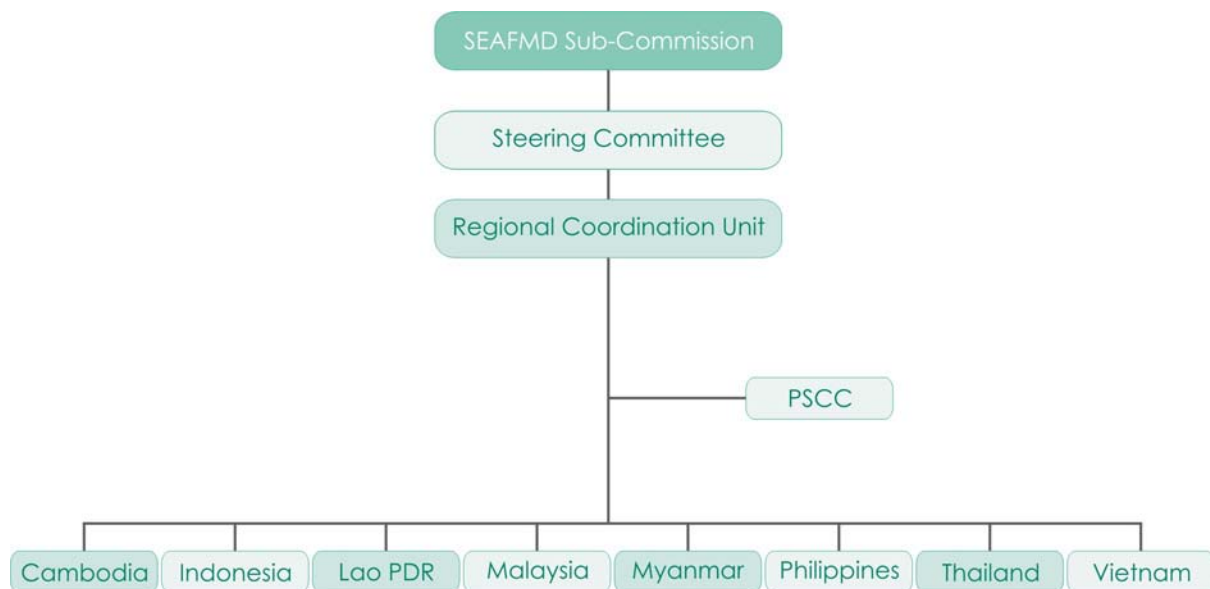


A village vaccination campaign in Cambodia



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Diagram of the SEAFMD Sub-Commission



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Terms of reference of the OIE Sub-Commission for foot and mouth disease in South-East Asia

1 The OIE Sub-Commission for foot and mouth disease in South-East Asia

1.1 The role of the OIE Sub-Commission for foot and mouth disease in South-East Asia

- The role of the Sub-Commission is to provide strategic direction to the SEAFMD campaign and the Regional Coordination Unit and to promote the prevention, control and eradication of foot and mouth disease in the region
- To foster a spirit of cooperation between member countries, to coordinate activities and to provide advice and assistance whenever possible
- It is usual for a wide range of observers from other countries and organisations to attend meetings of the Sub-Commission

1.2 Duties and responsibilities of the Sub-Commission and its members

- Advise on the coordination and management of the SEAFMD campaign
- Advise on the SEAFMD annual work plan
- To assist the OIE, ASEAN and major donors with monitoring, audit and evaluation of the SEAFMD campaign
- Member country delegates to provide reports and to coordinate the implementation of agreed actions within their country
- Members to contribute to conducting business by correspondence between meetings
- The Regional Coordinator shall provide reports to the Sub-Commission (1), the OIE Regional Commission (1), ASEAN (1) and major donors (2) or as required
- The Secretary shall be responsible for preparing agendas, invitations, recommendations and reports for the annual meeting. He/she shall also conduct correspondence between the Sub-Commission and its stakeholders

1.3 Frequency and location of meetings

- The Sub-Commission shall meet at least once a year in February or March
- Meetings will be held in one of the member countries and the order of rotation shall be agreed upon by member countries
- An extraordinary meeting can be convened with agreement by the President and Director General of the OIE
- Between meetings, business will be carried out by the Steering Committee or by correspondence with members

1.4 Rules of the Sub-Commission

- The Sub-Commission will have a quorum of seven (7) of its ten (10) members, provided that at least one OIE office bearer is present

- Decision-making will be carried out by consensus whenever possible. When necessary for a majority vote, each member shall have one vote
- The Sub-Commission shall be in relation to the OIE Scientific Commission for Animal Diseases
- The Secretary shall circulate a provisional agenda at least one month before each meeting
- Draft recommendations, action lists and minutes shall be available on the last day of each meeting. Revised lists of recommendations and the action required will be distributed within one month of the completion of the meeting
- A full report of the meeting will be published and distributed to delegates and observers within six months of the meeting
- Meeting costs for member country representatives of the Sub-Commission will be provided through the budget of the Regional Coordination Unit

1.5 Membership of the Sub-Commission

- A President nominated by the Director General, OIE Paris
- Two Vice-Presidents shall be elected from within the Sub-Commission for a period of three years. Their mandate may be renewed
- One official delegate per member country
- Regional Coordinator of the SEAFMD Campaign as the Secretary
- Representative from FAO
- Representative/s from donor organisations
- Any person whose presence the President deems useful shall also be eligible to participate in the work of the Sub-Commission. Such persons shall have no voting rights

2 Steering Committee to the Sub-Commission

2.1 Role of the Steering Committee

- Act as the executive for the Sub-Commission
- Provide policy and strategic advice to the Sub-Commission during and between meetings of the Sub-Commission
- Assist in promoting the SEAFMD campaign

2.2 Duties and responsibilities of the Steering Committee and its members

- The specific tasks of the Steering will be to:
 - Provide high-level policy and strategic advice to the Sub-Commission on FMD control in South-East Asia and the Regional Coordination Unit
 - Advise the Sub-Commission on development of the programme for the meetings of the Sub-Commission
 - Attend meetings of the Steering Committee and contribute to business out of session as required
 - The secretariat to produce minutes of meetings for the information of the Sub-Commission and other stakeholders

2.3 Frequency of meetings

- The Steering Committee will meet immediately before and as required during the annual Sub-Commission meeting
- At other times business will be carried out by correspondence (email, fax etc.) or telephone
- Meetings by telephone or in person can be initiated with agreement by the President

2.4 Rules of the Steering Committee

- The Steering Committee will have a quorum of five (5) of its seven (7) members
- Decision-making will be by consensus. The Secretary to the Steering Committee shall circulate a provisional agenda at least two weeks before the annual meeting
- Brief, action-oriented minutes of each meeting shall be available within one week of the completion of each meeting
- Subject to obtaining the prior agreement of the Chairperson, the Secretary may invite observers or advisors to meetings. Such observers and advisors shall have no voting rights
- The costs of the Steering Committee will be met from provisions in the budget of the SEAFMD Regional Coordination Unit

2.5 Membership of the Steering Committee

- The President of the Sub-Commission (Chair)
- The Vice Presidents (2) of the Sub-Commission
- The Director-General/Director of the host country and he/she will serve until the next meeting of the Sub-Commission
- Representative of the Director-General of the OIE, Paris
- The OIE Regional Representative for Asia and the Pacific
- Representative of the ASEAN Secretariat
- Representative of FAO
- Representative from donor/s
- Regional Coordinator for the SEAFMD campaign (Secretary)

3 The Private Sector Consultative Committee

3.1 Role of the Consultative Committee

- To advise the Sub-Commission on ways to facilitate developments in the livestock sector that support disease control and optimise production and to integrate the private sector into national and regional animal health systems
- To assist in the development of the regional plan for enhancing private sector involvement in FMD control in South-East Asia
- To provide an avenue for two-way communication and information exchange between the Sub-Commission and private sector organisations in member countries
- To actively promote the South-East Asia Foot and Mouth Disease Campaign among the private sectors

3.2 Duties and responsibilities of the Consultative Committee and its members

The specific tasks of the Private Sector Consultative Committee will be to:

- Provide strategic advice to the Sub-Commission on private sector involvement in FMD control in South-East Asia
- Advise on the development and implementation of the plan for enhanced private sector involvement in FMD control in South-East Asia
- Provide policy and strategic advice to the Sub-Commission during and between meetings of the Sub-Commission
- Produce minutes for the information of members of the Sub-Commission and other stakeholders

3.3 Frequency of meetings

- The Consultative Committee will operate by correspondence, fax, email and telephone conference whenever possible
- An in-person meeting will be held annually in association with the meeting of the Sub-Commission or at any other date that members may suggest

3.4 Rules of Private Sector Consultative Committee

- The Private Sector Consultative Committee Steering Committee will have a quorum of 60% of members when meeting in-person
- Members can nominate a suitable person to deputise for them if they are unable to attend a meeting
- Decision making will be by consensus. The Secretary shall circulate a provisional agenda at least two weeks before the annual meeting
- Brief, action-oriented minutes of each meeting shall be available within one week of the completion of each meeting
- Subject to obtaining the prior agreement of the Chairperson, the Secretary may invite observers or advisors to meetings. Such observers and advisors shall have no voting rights
- The costs of the committee will be met from provisions in the budget of the Regional Coordination Unit
- The terms of reference and membership will be reviewed at the annual Sub-Commission meetings
- Secretariat services will be provided by the Regional Coordination Unit

3.5 Membership of the Private Sector Consultative Committee

- The Chairperson shall be a private sector member of the PSCC, elected by the membership
- Eight persons (8) from the private sector with a broad knowledge of countries and industry sectors shall be appointed by the OIE Sub-Commission for a period of three years. Their mandate may be renewed
- The President of the Sub-Commission or his/her delegate
- Members of the Steering Committee of the Sub-Commission
- The SEAFMD Regional Coordinator (Secretary)

Useful websites

Advanced Veterinary Information System

www.aleffgroup.com/avisfmd/about.html

Asian Development Bank

www.adb.org/

Association of Southeast Asian Nations

www.aseansec.org/

Australian Agency for International Development

www.usaid.gov.au/

Australian Agency for International Development

www.usaid.gov.au/

Australian Centre for International Agricultural Research

www.aciar.gov.au

Cambodia: Department of Animal Health and Production

www.maff.gov.kh/en/depts/dahp.html

Food and Agriculture Organization of the United Nations

www.fao.org/

Indonesia: Ministry of Agriculture

www.deptan.go.id/english/index.html

Japan International Cooperation Agency

www.jica.go.jp/english/

Joint FAO/IAEA Research Project on FMD

www.iaea.org/programmes/.nafa/d3/index.html

Malaysia: Department of Veterinary Services

agrolink.moa.my/jph/

Myanmar: Ministry of Livestock and Fisheries

www.livestock-fisheries.gov.mm/default.htm

OIE Regional Representative for Asia and the Pacific

www.oie-jp.org/

Panaftosa – Centro Panamericano de Fiebre Aftosa

www.panaftosa.org.br/

Philippines: Department of Agriculture
www.da.gov.ph/

SEAFMD campaign
www.seafmd-rcu.oie.int/

Thailand: Department of Livestock Development
www.dld.go.th/webenglish/

The European Commission for the Control of FMD
www.fao.org/ag/AGA/AGAH/EUFMD/default.htm

Vietnam Livestock Working Group
www.livestockworkinggroup.org

Vietnam: Department of Animal Health
www.mard.gov.vn/

World Organisation for Animal Health (*Office International des Épizooties*)
www.oie.int/

World Reference Laboratory for FMD
www.iah.bbsrc.ac.uk/virus/Picornaviridae/Aphthovirus/index.html

Lao farmer using buffalo to plough his field



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