

Working towards consensus: the need for coordinated policies to assist control of foot and mouth disease and emerging disease threats in South-East Asia

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Summary

Foot and mouth disease (FMD) is an important transboundary disease in South-East Asia. Its control has been a priority in the region for at least 20 years, with extensive institutional support and capacity-building being provided by the international community through the World Organisation for Animal Health. This paper describes the FMD control and eradication programme in the Mekong region (Myanmar, Thailand, the Lao People's Democratic Republic, Cambodia and Vietnam) of South-East Asia and evaluates the FMD control programme in one of the region's countries, namely Cambodia. Significant progress has been made, and the strategy for eradication is now both clearly understood and feasible in the Mekong. However, FMD control in this region requires more than just an effective vaccination strategy and regulatory support. Success will also depend on obtaining consensus and buy-in at all levels of the value chain, from input suppliers to consumers. Culturally and economically acceptable incentives must be in place to ensure that control measures are implemented, and those stakeholders who are expected to bear the risk and costs of control programmes must also be the main beneficiaries. The present institutional environment in the Mekong, and in particular in Cambodia, makes control and eradication of transboundary diseases difficult. Further work is required to ensure that control strategies are aligned with stakeholder needs and priorities, and actively improve smallholder welfare. Cattle producers and traders are crucial to the control of FMD in Cambodia. Economic incentives and education as well as regulation are required to ensure these stakeholders participate in this important transboundary disease eradication programme.

Keywords

Cambodia – Cattle – Foot and mouth disease – Governance – Institutions – Mekong – Smallholders – South-East Asia.

Introduction

Effective livestock disease control requires concerted institutional and community support, particularly when working with transboundary diseases. The impact of foot and mouth disease (FMD) varies between and within countries depending on disease incidence, the importance of affected species to the smallholder, control costs and the impacts of control programmes on production and fertility (1). This paper describes the FMD control and eradication

programme in the Mekong region (Myanmar, Thailand, the Lao People's Democratic Republic [Lao PDR], Cambodia and Vietnam) of South-East Asia, and highlights the particular governance issues that must be considered when implementing transboundary disease control programmes. It discusses particular issues that are relevant at the regional level and then evaluates the FMD control programme in one of the region's countries, namely Cambodia. In this paper the authors will:

- provide a brief overview of the FMD control programme in South-East Asia

- discuss policy development in the Mekong region, and how consensus is being reached to maximise the potential for control/eradication of FMD
- outline the importance of having consensus across the value chain to control FMD.

The history of the foot and mouth disease control programme in the Mekong region

Foot and mouth disease has the potential to disrupt regional and international livestock trade and threaten cattle smallholder livelihoods. Eradicating FMD, therefore, has the potential to improve the livelihoods of communities and bring other benefits to the region as a whole (public benefits), as well as to smallholders and associated cattle value chain stakeholders (private benefits). To eradicate FMD, policy-makers must understand and integrate both these areas of benefit and plan control programmes accordingly. In 1994, the South-East Asia FMD campaign (SEAFMD) was established, and included Cambodia, Lao PDR, Malaysia, Myanmar, the Philippines, Thailand and Vietnam. Through SEAFMD, member countries began to address the significant social and economic impacts of FMD. They realised that control and eradication of FMD was complex, particularly in the Mekong region, where the countries are culturally and socio-economically diverse and have different institutional strengths and weaknesses.

In 1997, SEAFMD was formally recognised by the World Organisation for Animal Health (OIE). A Regional Coordination Unit was established to commence implementation of a disease control programme. Implementation has been divided into five phases.

In the initial stage (1997–2001), the seven founding countries received donor support in the form of capacity-building to develop the techniques and skills to implement a control programme. The key benefits of this stage were improvements to regional coordination, sharing of best practices and resources, and improvements in public awareness. A review of the first phase concluded that the regulatory environment was weak in most member countries, and better disease surveillance and reporting was required to improve the effectiveness of FMD control (2). While this was true, there was no discussion of how this might be developed within the diverse economic and cultural conditions influencing the cattle industries in these countries. At this early stage, control centred on seeking

technical and institutional solutions, rather than solutions incorporating the economic and social priorities of the primary stakeholders, smallholder cattle producers and traders.

Economic analysis that assessed the potential benefits of reductions in animal health expenditure, trade gains and animal welfare indicated that control programmes in Thailand could be justified. The benefits would be easier to attain and be more far-reaching, however, if the eradication campaign included the other South-East Asian countries (3).

The second phase (2001–2005) involved developing a Regional Strategic Plan that incorporated the national plans of the partner countries and sought to coordinate partnerships between development partners and the Association of Southeast Asian Nations (ASEAN). In 2005, the campaign was recognised by ASEAN as an effective model to control and eradicate transboundary and emerging animal diseases. The importance of ensuring both public and private benefits in any transboundary disease control programme was identified, as well as the difficulties in deciding how much protection was appropriate and who should provide (or pay for) this protection (4). In this phase and the following phase, the focus on the institutional building required to manage a transboundary disease continued, with less emphasis on local or community incentives and priorities.

A significant step forward was made in 2010 when a range of disciplines were integrated to consider the next steps in FMD control in the Mekong region (5). For the first time, the importance of community ownership and the market chain were acknowledged as being important in assisting FMD control. The three research and development priority areas (5) were identified as:

- improving community-based biosecurity
- improving animal health, productivity and market opportunities through the adoption of improved on-farm biosecurity measures
- implementing international biosecurity standards, complemented by measures appropriate to the social, cultural and economic needs of the community.

Continuing areas of focus included intergovernmental coordination, veterinary capacity and governance in the member countries, outbreak investigation, laboratory capacity, and early detection. However, research for development (R4D) was also conducted, seeking to encourage village-level adoption, taking into account greater consideration of the role of increasing demand for beef in the region, and the implications this had for disease movement. This phase also involved the introduction

of the Progressive FMD Control Pathway (PCP), which prioritises activities in the member countries as determined by their institutional and social strengths. Under the PCP, Group 1 countries (Cambodia, Lao PDR and Myanmar) are implementing activities to combat FMD at its source; Group 2 countries (China, Malaysia, Thailand and Vietnam) are establishing and expanding existing FMD control zones; and Group 3 countries (Brunei Darussalam, Indonesia, Singapore and the Philippines) are focusing on protection and maintaining FMD-free status.

The present phase (2015–2020) will further assist member countries that are free from disease to maintain their FMD-free status and will seek to extend disease-free status, with or without vaccination, to other countries within the region. Close cooperation between member countries will continue during this phase, especially in the areas of coordination, governance of veterinary service systems, management of complementary projects to support capacity-building, and prevention and control of emerging infectious diseases to support public health. It is expected that the conclusion of this phase will include an exit strategy whereby participating countries and the region as a whole, driven by strong economic growth, will have the capacity to take ownership of the continued eradication of FMD.

The international strategy, led by the OIE, has had great success in developing policies and procedures that have the capacity to control FMD. Control of FMD in some of the Mekong countries, particularly the Group 1 countries mentioned above, however, has been minimal, as there has not been sufficient consensus, or matching of priorities, between international agencies, national governments and cattle industry stakeholders, particularly smallholders.

Public and private investment in foot and mouth disease control in Cambodia

Like any investment, the decision by governments and individuals to invest depends on expected benefits and opportunity costs. For FMD to be controlled in Cambodia, benefits from improvements in trade and household livelihoods need to outweigh the costs of control and the opportunity costs of alternative investments. At present, the level of both public and private investment in FMD control implies that these benefits are not perceived to be sufficient. The following discussion highlights the continuing institutional, economic and capacity issues that influence government (public benefits) and smallholder (private benefits) desire to invest in and support FMD control in Cambodia.

Public-sector investments and priorities

Governments need to allocate scarce resources between many competing economic and welfare objectives. At the time of writing, the Cambodian government is not prepared to invest heavily in FMD control as it has other priorities. The Ministry of Agriculture, Forestry and Fisheries provides vaccination programmes for three livestock diseases that cause cattle mortality: haemorrhagic septicaemia (HS), anthrax, and blackleg. FMD receives less support as it is generally considered to be a non-fatal disease. FMD control in Cambodia has been largely dependent on foreign assistance. Consequently, vaccination has been sporadic and poorly targeted.

Before 1990, a number of non-governmental organisations, with Cambodian government counterpart funding, provided FMD, HS, blackleg and anthrax vaccines as part of the overall animal health assistance programme to Cambodia. During this period, Village Livestock Agents were trained, and played an important role in delivering an estimated two million doses of FMD vaccine per year to prioritised villages. During the 1990s, a user-pays policy provided vaccination against HS, blackleg and anthrax, with the main purpose being to maintain cattle as a source of draught power, rather than to maintain beef productivity. FMD was regarded as a public–private responsibility. Donor support for FMD vaccination began in 1999 and has continued with national government support.

In 2010, China joined SEAFMD and it was renamed the OIE South-East Asia and China Foot and Mouth Disease (SEACFMD) Campaign. This expanded body identified a number of key factors for controlling FMD in Cambodia. These included strengthening Veterinary Services (through improving animal health and production legislation), improving veterinary education and laboratory capacity, developing public–private partnerships, increasing disease surveillance, and improving public health. Cambodia has responded by drafting new laws on animal health and production, establishing a six-year curriculum of veterinary medicine at the Royal University of Agriculture, and prioritising livestock development as one of the key areas of the national development strategy. In 2015, the national government budget for animal health and production services increased three-fold to \$3 million (all dollar amounts are given in US dollars), compared to the 2014 budget. FMD surveillance and information systems and animal movement management have been highlighted in the 2015 annual work plan of the Department of Animal Health and Production (DAHP).

Despite the three-fold increase, this budget allocation remains insufficient to purchase enough FMD vaccine

to implement a national mass vaccination campaign. The cattle and buffalo population in Cambodia is approximately four million head (6), but between 2008 and 2013 the government was only able to supply, on average, 45,000 doses per year. The DAHP relies on continuing support from international agencies such as SEACFMD (OIE) to provide additional FMD vaccine, mainly for strategic and ring-vaccination programmes to prevent and control FMD outbreak and spread. In Cambodia, even though vaccination may be cost-effective and technically feasible it is not heavily supported by government. The level of government investment in FMD control implies that, even though the government supports control efforts managed by international donors, it has other development priorities at present. The government is unable to provide the required internal capacity and budget to implement a meaningful control process.

Cattle producer investments and priorities

There is evidence that FMD exerts severe economic pressure on Cambodian livestock smallholders. A 2010 study in southern Cambodia estimated losses of between \$216 and \$370 per household, attributed to FMD (7). Another study estimated a loss to farmers ranging from \$10 to \$150, from an average income of approximately \$1,000 per annum (8). These losses were associated with treatment costs, abortions, loss of draught power, extra transport costs, extra labour, and loss of asset value. A 2014 study, commissioned by the OIE Sub-Regional Representation for South-East Asia, indicated a loss of more than \$200,000 for 12 villages, attributed to the FMD outbreaks (9). A study of an FMD outbreak in Lao PDR in 1999 (10) indicated that the trade in cattle and buffalo was severely interrupted by the presence of FMD, leading to difficulties in buying and selling healthy animals and long-term effects on herd dynamics.

Even with these significant estimates of reduced smallholder cattle profitability, producers often do not change their practices and do not invest in FMD vaccination of their cattle. Other factors, such as the importance and role of cattle in the farming system and the perceived FMD risk, often influence a smallholder's attitude to FMD vaccination (11). In extensive cattle rearing systems in Bolivia it was shown that producers were only vaccinating when there was a perceived risk, they were not vaccinating to eradicate the disease (12). Although FMD is highly infectious, mortality rates are low, and this contributes to the low interest and engagement of smallholders in implementing FMD control measures. Even though studies show that losses can be high, if smallholders can recognise the disease and realise

that the cattle will recover, and if at the same time they have doubts about the efficacy of a vaccine or vaccination programme, they are more likely to take a risk and use their money in other ways. In most cases, labour is the major cost of FMD vaccination, apart from medication, and labour is something that is regularly available in the smallholder household. For many smallholders, cattle diseases such as HS are often regarded as more costly than FMD in the medium to longer term.

Potential issues limiting effective control of foot and mouth disease in Cambodia

The low priority given to FMD control, both by the Cambodian government and smallholders, may be due to a variety of factors. It is important to realise that control is dependent on both government *and* smallholders moving towards support for FMD control, with appropriate international inputs and support. Government *or* smallholder support alone will not result in successful eradication of FMD in Cambodia.

The transboundary nature of foot and mouth disease

Eradication of a transboundary disease requires an international consensus across the region. If one country in the Mekong region is not involved in the FMD programme, FMD will not be controlled. If FMD control is important to some countries and not to others, there will need to be regulation to stop the movement of cattle from endemic to disease-free areas, and/or assistance given to encourage the participation of less-motivated countries. This type of support is already being provided SEACFMD, but it is still vital to convince producers and traders to assist and become involved. Once again, this will need to be through both regulation and enforcement, and private incentives.

Local movement of cattle

Local movement of cattle is influenced by seasonal access to feed (communal grazing land, rice stubble, etc.) and water. Group housing and communal feeding inevitably bring livestock from different groups or villages into contact with each other, and are therefore regarded as being a major cause of disease dissemination (13, 14). Domestic and international trade also brings animals from various areas into contact with each other, as they are often confined together for some time within the village environs before being transported to larger centres.

Interprovincial and international movement of cattle

The cattle industry in Cambodia is experiencing significant upheaval as demand for beef increases throughout South-East Asia and China. Up until 2013 there was a significant amount of transit trade across Cambodia, with cattle from Myanmar and Thailand moving south towards markets in southern Vietnam; however, increasing demand from China has led to cattle from Myanmar, Thailand and northern Vietnam now heading north into Chinese markets instead. This has led to a decrease in supply in southern Vietnam and hence an increase in demand for the traditionally more expensive cattle from neighbouring Cambodia. Southern Vietnam has always been the major market for Cambodian finished cattle, but there is now increasing demand for younger animals, which are fattened in Vietnam and reclassified as local Vietnamese cattle (15).

While the effect on disease spread is unknown, it is having a significant impact on the Cambodian beef price and population. Figure 1 represents the market chain for cattle from Kampong Cham province, situated on the eastern border with Vietnam. In this province, cattle are traditionally produced by smallholders, with only 25% being sold or consumed locally. The remainder go to Vietnam (50%) and Phnom Penh (25%).

As with locally sold cattle, exported cattle and buffalo are mixed together at the export depots before walking across the border to a Vietnamese market (16). A study carried out in 2012 revealed that across South-East Asia, movement of

livestock is largely market driven and is usually unofficial (17). There is a significant risk of disease spread when cattle transit through areas recently vacated by an infected consignment, when an uninfected consignment mixes with infected animals, or when animals come into contact at feed or watering points (16).

Cambodia is a net exporter of cattle, with minimal numbers being imported from Thailand and Lao PDR. These international cattle movements from provinces such as Kampong Cham and Takeo are mostly informal and unregulated (18). For a country like Cambodia, with open borders and movement of cattle mostly through, or out of, the country, the capacity to control and benefit from control of a transboundary disease such as FMD is minimal. Getting to the stage of being declared disease free and, therefore, being able to trade cattle with other disease free countries, is therefore many years away.

Institutional weakness

Many countries, including Japan, South Korea, and the United Kingdom, have used a ‘stamping-out’ strategy to control FMD, and it is the most cost effective method for rapid elimination of a livestock disease. It requires the immediate slaughter of all susceptible animals in the infected areas. However, this strategy is not possible in Cambodia due to lack of resources, infrastructure, legislation and community support. The government does not have the resources to pay adequate compensation for the facilities, nor the capacity to humanely and efficiently implement this strategy.

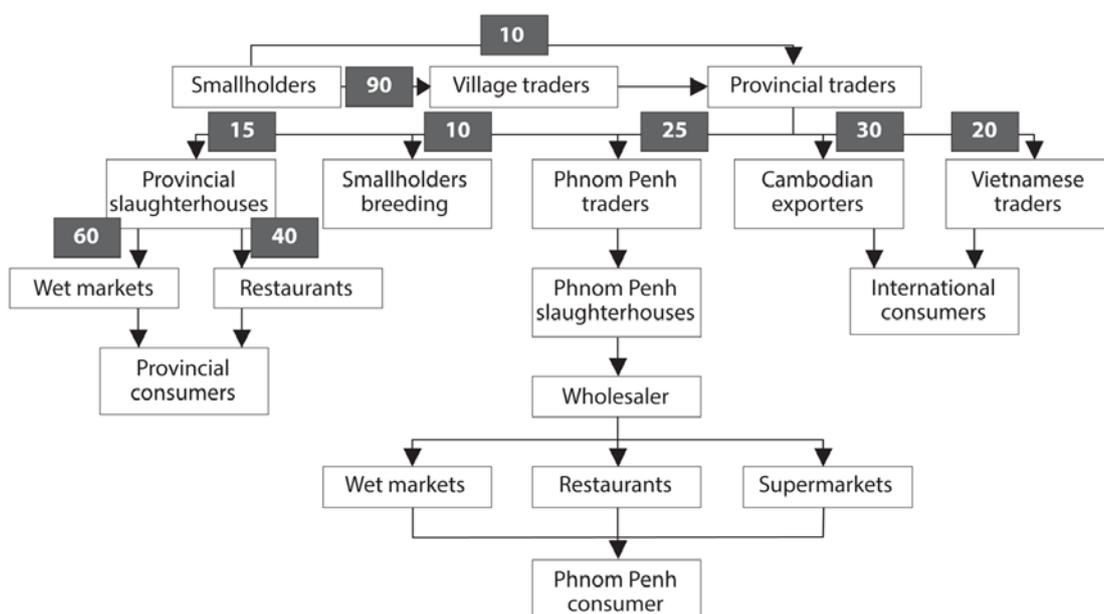


Fig. 1
The cattle value chain in Kampong Cham province, Cambodia
 The numbers represent the percentage of cattle at different steps in the chain
 Source: Patrick *et al.* (15)

The current process of disease surveillance does not encourage government staff to actively report new cases or outbreaks of FMD. This is thought to be because these staff tend to be blamed for the outbreak, rather than given support to implement control activities. Therefore, only significant outbreaks that have become obvious tend to be reported, while the remainder are ignored. Under-reporting of disease has been recognised as an important issue in other countries in the region as well (19).

A study conducted in Cambodia during the 2010 FMD outbreak revealed that disease reporting and investigation remains a critical weakness in many disease control efforts (20). It took longer than four weeks for one of the District Offices of Animal Health and Production to collate and send an outbreak report to the Provincial Office of Animal Health and Production. This lack of urgency in FMD reporting suggests that either FMD was not viewed as a serious disease by many stakeholders, including animal health staff, or that disease reporting was considered unlikely to achieve a useful response from veterinary authorities further along the reporting pathway (20).

Farm-level issues

Most improvements to disease control require changes in farmer practice. Even though such changes may be minor and inexpensive, farmers are still often unwilling to change (21). The question that smallholder cattle farmers ask is, 'why should I spend money on my healthy animals?' Before control programmes can be implemented, this question needs to be answered by other stakeholders, including veterinary authorities and markets.

The commitment of smallholder livestock farmers to vaccination programmes in rural areas is vital to the success of the programme. Farmers are clearly reluctant to accept vaccination as an important disease control measure, as evidenced by their lack of participation in subsidised vaccination programmes and their reluctance to invest privately in FMD vaccines. Interestingly, however, when their cattle do get sick farmers will do what they can to purchase medication even though the cost is much higher than vaccination.

A study in two villages in Cambodia found that 46% and 21% of farmers, respectively, had vaccinated their cattle against FMD. However, there was no knowledge of how often the cattle were vaccinated (22). In another study, no cattle in four surveyed villages in two Cambodian provinces were recorded as having been vaccinated for FMD (5). Another survey of smallholder cattle farmers in two Cambodian provinces showed that more than half of the farmers interviewed had their animals vaccinated against FMD in 2012 (55% and 71%, respectively), but the majority of those only vaccinated their animals once a year (71% and 66%, respectively) (7).

The reasons for low uptake of FMD vaccination by smallholders are thought to be: perceived high cost of FMD vaccine or insufficient funds to purchase vaccine; lack of confidence in vaccine efficacy; lack of knowledge of disease spread and prevention measures; failure to recognise the full costs incurred when an outbreak happens; and lack of conviction that FMD is actually an important disease for them.

Traders are able to take advantage of farmers' lack of understanding of FMD. One study reported that 83% of traders advised farmers to sell their sick livestock because of the possibility of them dying (23). More than half of these traders also acknowledged that they sold stock with FMD because they could purchase them at a greatly reduced price and then either sell directly for slaughter, or keep and sell for a significantly higher price when the animal recovered (23). Anecdotal evidence suggests that movement and sale of infected cattle is common (including during outbreaks), and is an important risk factor in spreading the disease. Sharing common grazing areas also poses a significant risk of FMD dissemination (24). At present, Cambodian traders are able to maximise their benefits, with low transaction costs, by using informal cattle movement pathways.

Conclusion

An effective control programme depends upon applying the appropriate combination of techniques, as well as appropriate levels of support from the international community (particularly neighbouring countries), national and local governments, and industry stakeholders. At present, Cambodia does not have the capability or resources to implement a national FMD control programme. The major factors influencing this are: the relatively unrestricted movement of animals; the inability to implement effective surveillance; unreliable reporting and control systems; and lack of stakeholder participation.

The Cambodian government must continue to:

- work with the international community
- develop institutional strength
- strengthen border controls
- work with cattle industry stakeholders, particularly producers and traders.

FMD can be eradicated from Cambodia and the Mekong region, but it will require consensus and continued cooperation among all stakeholders.



En quête d'un consensus : l'importance de politiques coordonnées pour contrôler la fièvre aphteuse et faire face aux menaces suscitées par les maladies émergentes en Asie du Sud-Est

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Résumé

La fièvre aphteuse est une maladie animale transfrontalière majeure en Asie du Sud-Est. La lutte contre cette maladie est une priorité depuis au moins deux décennies dans la région et fait l'objet d'un soutien institutionnel important et d'activités de renforcement des capacités de la part de la communauté internationale par le biais de l'Organisation mondiale de la santé animale. Des progrès significatifs ont été accomplis, de sorte que la stratégie d'éradication est désormais bien comprise et constitue un objectif atteignable dans la région du Mékong. Néanmoins, la lutte contre la fièvre aphteuse dans cette région exige davantage qu'une simple stratégie de vaccination assortie d'un soutien réglementaire. Le succès dépendra également du consensus mis en place et de l'adhésion des acteurs de chaque échelon de la chaîne de valeur, depuis les fournisseurs d'intrants jusqu'aux consommateurs. Des mesures incitatives acceptables au plan culturel et économique doivent être proposées afin de garantir la mise en œuvre des mesures de lutte, en faisant en sorte que les parties prenantes qui supportent les risques et les coûts des programmes de lutte en soient également les principaux bénéficiaires. Le contexte institutionnel actuel ne facilite pas le contrôle et l'éradication des maladies transfrontalières dans la région du Mékong, notamment au Cambodge. Des efforts supplémentaires seront nécessaires pour s'assurer que les stratégies de lutte sont adaptées aux besoins et aux priorités des parties prenantes et qu'elles améliorent efficacement les conditions de vie des petits éleveurs. La participation des éleveurs et des négociants de bovins dans la lutte contre la fièvre aphteuse au Cambodge est déterminante. La mise en place d'incitations économiques et des efforts en matière d'éducation et de législation sont indispensables pour que ces parties prenantes jouent un rôle plus actif dans le programme d'éradication de cette maladie transfrontalière majeure.

Mots-clés

Asie du sud-Est – Bovins – Cambodge – Fièvre aphteuse – Gouvernance – Institutions – Mekong – Petits éleveurs.



Cómo generar consenso, o la necesidad de políticas coordinadas contra la fiebre aftosa y las amenazas sanitarias emergentes en Asia Sudoriental

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Resumen

La fiebre aftosa es una importante enfermedad transfronteriza que asola el Sudeste asiático. Hace 20 años que la lucha contra ella es una de las prioridades de la región, que para ello ha contado con servicios de capacitación y un vasto

apoyo institucional por parte de la comunidad internacional a través de la Organización Mundial de Sanidad Animal. Se han logrado avances sustanciales, y ahora hay una estrategia para erradicarla que todas las partes entienden claramente y resulta viable en la región del Mekong. Sin embargo, la lucha contra la enfermedad en esta región requiere algo más que una estrategia eficaz de vacunaciones y apoyo reglamentario. Para tener éxito en la empresa también hay que suscitar consenso y adhesión en todos los niveles de la cadena de valor, desde los proveedores de insumos hasta los consumidores. Para asegurar una aplicación efectiva de las medidas de control es preciso que existan incentivos cultural y económicamente aceptables, y aquellos interlocutores que en principio deban asumir los riesgos y costos de los programas de lucha deben ser también sus principales beneficiarios. La arquitectura institucional presente actualmente en la zona del Mekong, especialmente en Camboya, dificulta el control y la erradicación de enfermedades transfronterizas. Aún queda trabajo por delante para lograr que las estrategias de lucha respondan a las necesidades y prioridades de los interesados y para mejorar activamente el nivel de bienestar de los pequeños ganaderos. Para lograr que los productores y tratantes de ganado, que son un eslabón esencial de la lucha contra la fiebre aftosa en Camboya, participen en este importante programa de erradicación de una enfermedad transfronteriza se requieren a la vez incentivos económicos y una labor pedagógica.

Palabras clave

Asia Sudoriental – Camboya – Fiebre aftosa – Ganado bovino – Gobernanza – Instituciones – Mekong – Pequeños ganaderos.



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