Detailed Sanitary and Phytosanitary (SPS) Issues Sector Assessment

1. Introduction

1. **This sector analysis summarizes the SPS context and major technical, human and financial issues** (and their implications for developing AFF trade and managing human, plant and animal health) in GMS and in CL.[1] The material begins with contextual background regarding trade and health issues, and then moves on to outline the various technical dimensions of SPS management systems, and then outlines the financial and human resource issues that underpin national SPS systems' performance and sustainability.[2]

2. SPS Measures, Trade And Health In GMS: The Context

2. **Trade in the GMS is growing rapidly, and trade in SPS-affected products among GMS countries even more so.** With rising incomes across most of the GMS, total recorded exports of agriculture, forestry and food (AFF) products – these are the products to which SPS measures apply - within GMS countries was nearly US$ 9.27 billion in 2009. Total GMS AFF exports grew more than fourfold between 2000 and 2009, and are currently growing at over 10% annually. In 2009, something over half of all AFF exports to other GMS countries (with a value of $4.5 billion) were from Thailand, nearly $2 billion were from Viet Nam and $1.7 billion were from China. The AFF exports of Lao PDR and Cambodia are smaller (at $333 million and $285 million respectively). Trade concentration (i.e., total GMS destined exports as a percentage of total exports) in AFF is also increasing - from less than 7% in 2002 to over nearly 14% 2009. The GMS trade concentration for AFF non-food products is much higher than for food and live animals, at 39% and 8%, respectively. Annex 1 summarizes some of the key features of GMS AFF trade.

3. **SPS measures directly and indirectly affect trade performance.** Nearly all AFF products have to meet sanitary and phytosanitary requirements.[3] In practice, SPS measures can be imposed on products for which phytosanitary risks are negligible (e.g., green coffee and processed rubber, though seed and propagation materials of coffee and rubber can present high risk). Some products face more costly and technically complex requirements

[1] The analysis herein focuses primarily on technical aspects of CL SPS situations; the economic implications of systems' performance, the economic rationale for supporting SPS capacity building, and the nature of financial and economic costs and benefits associated with this are captured in the respective projects' economic analyses.

[2] Separate country-specific SPS sector analyses for Cambodia and Lao PDR provide an overview of SPS regulatory and institutional frameworks and overall systems' capacity (including the role of the private sector) before moving on to outline the technical issues (and consequent potential specific investment opportunities) in each of the areas of: (i) plant health; (ii) animal health; (iii) food safety; and, (iv) academic education which are the focus of the proposed project.

[3] The 1994 WTO SPS Agreement through its multilateral framework provides the principles for measures of health protection that are designed to avoid unnecessary disruption of trade. The basic principle to observe is to provide transparency about measures. Measures should be published in ways readily available to trading partners, and reasons for measures should be given. A second principle is that measures should be justified on the basis of science. Risk analysis based on science should be used to justify measures. Where available, international standards of the Codex Alimentarius, IPPC and OIE are considered science-based. Thirdly, measures taken should be in proportion to the risk they address. Expensive measures should be avoided in dealing with small risks; zero risk tolerance is not a principle of WTO. Fourthly, countries cannot prescribe other countries which methods to be used in protective measures; they should accept other countries' measures if these provide equivalent protection. Fifthly measures should not discriminate between countries and between foreign and domestic producers. Finally, use of international standards is encouraged, though it is not an obligation.

than others; such 'SPS high-sensitivity products' include live animals, dairy, meat, fish, fresh fruit and vegetables. 'SPS low-sensitivity' products include grains, beverage crops, and most non-food products. Requirements for SPS low-sensitivity products, although not technically complex, can still be significant in economic terms, and can be difficult for countries with low capacities to meet. In 2009 the percentage of SPS high-sensitivity AFF exports in China, Myanmar, Thailand and Viet Nam ranged between 36% and nearly 50%% but it was only 7%in Lao PDR. In general, exports among GMS countries consist of a lower share of SPS high-sensitive products than exports to OECD countries do (which includes a relatively large proportion of fish and fish products).

4. **SPS performance contributes directly to the regional and national investment climates, and to levels of private profitability.** There are many deficiencies in present SPS capacities and SPS management in GMS that unnecessarily inhibit trade or unnecessarily raise costs of doing business. For example, several SPS import requirements in the region effectively block market access - such as in the case of Chinese requirements for Cambodian and Lao PDR exports of rice and corn. In some cases such bans may be justified, but in other cases they can be avoided or mitigated by: (i) exporters by providing sufficient information to authorities in the importing country; (ii) better application of risk analysis; or, (iii) better handling by authorities in the exporting country. Even if there is no ban, SPS measures still can be costly and erode profitability; examples include: (i) over-cautious post-harvest treatment requirements and overly-onerous inspections and approval procedures on both sides of the border (with consequent long waiting time); (ii) technical requirements not being based on proper risk analysis; and, (iii) frequent use of precautionary SPS measures. Some of these measures may be unnecessary, and/or costs can be avoided by better organization, better application of science and technology, and through improved governance. Weak implementation of health control measures can also involve high risks to investors; disease outbreaks and poor SPS response capacity can result in blanket bans or costly requirements, which can greatly diminish the return to investments. Likewise, inadequate government control of pesticides and animal drugs can impose heavy burdens of control cost and risk on exporters.[4]

5. **SPS management capacity affects human wellbeing and incomes through improving protection against trade-related health hazards.** Health hazards can be costly to people and to national economies; specifically the introduction of new pests and diseases may have dramatic impacts on production and income of producers. Consumers' health and wellbeing can be strongly affected by adulterated, spoiled, contaminated and sub-standard food products[5]; people lose incomes because of illness, and they have to pay for medical

[4] Some examples of SPS measures that unnecessarily increase the cost of doing business include: (i) requirements of phytosanitary certificates for green coffee and rubber in most cases unnecessarily increase transaction cost of exports since trade arrangements for these products are not pathways for pest and disease; (ii) required export sanitary permits are in cases unnecessary because the importing country and buyer do not require it; (iii) an investor in a banana plantation in one of the GMS countries finds out that export to another GMS country is not possible because government is not able to provide pest data on banana (import prohibitions based on exporting country's lack of, or unreliable, pest data); (iv) onerous application procedures and waiting periods to obtain import permits, phytosanitary certificates, etc. raise cost of doing business and, in fact, encourage smuggling; (v) no advance lodgment of import/export documentation with indication of entry point can be made; (vi) waiting times for border clearance are longer than necessary, often as a result of inefficient procedures and uncoordinated customs and quarantine inspection procedures; (vii) Import/export procedures between provincial and national entry points not harmonized; (viii) sampling and inspection are conducted of all imported shipments, even for routine shipments and shipments of low-risk products; (ix) SPS requirements are applied as a routine rather than being based on risks; (x) some countries lack scientific expertise and data to negotiate/rebut unnecessary risk mitigation requirements, or to propose equivalent measures; (xi) lack of confidence in exporting country's pest-free areas or pest outbreak exclusion zones leads to blanket bans; and (xii) informal payments are related to SPS control functions.

[5] Examples of food safety hazards include: (i)residuals of forbidden antibiotics (nitrofuran, chloramphenicol) and growth enhancers (clenbuterol) in food; (ii) mycotoxins in nuts, corn and dried fruits; (iii) microbial, heavy metal and pesticide contamination; (iv) unauthorized presence of preservatives, additives and supplements or in

treatment. Measured by DALYs[6] caused by diarrheal diseases (often used as a general indicator of the food safety situation), the situation in GMS countries is far from satisfactory.[7] Particularly in Cambodia and Lao PDR, healthy lifetimes are lost because of diarrheal and other diseases, compared to regional countries (as well as OECD countries). Many pests, diseases and sub-standard foods spread easily across long porous borders in the GMS, which means that - without cooperation among neighboring countries – individual populations are exposed to collective risks.

6. **Adoption of WTO principles and practice is paramount.** Countries around the world are increasingly applying WTO principles in their import requirements; both ASEAN and GMS have adopted these principles as the bases for harmonization and economic integration. In general, this means that: (i) more national and international standards are adopted; (ii) increasingly, importing countries require exporting countries to provide data about health hazards, and they base their decisions about granting market access on risk analysis (especially for new products); and, (iii) more tests and inspections are carried out to ensure compliance. While no country in the world complies fully with all the principles and recommendations of the WTO SPS Agreement, it is clear that for a country to benefit from WTO membership (and for a group of countries to use the WTO framework as a basis for economic integration) a fair degree of harmonization with the principles of the international system is necessary. In practice there is room for selectivity and prioritization based on a country's product mix, pest and disease situation, its level of development, and the specific requirements of potential markets.

7. **Notwithstanding the economic advantages of WTO-based SPS systems, compliance can be costly.** Since many AFF products (e.g., grains) have low unit values, inefficient SPS handling may weigh heavily on profitability. Also, the total compliance cost for several of these products (e.g., forest products, cassava and grains) may be high because of the large volume in trade. Countries with low SPS management capacities may be particularly hard hit if trading partners ask for pest data for low-sensitivity products that is not available, or if trading partners impose risk-mitigation measures.

3. SPS Issues in CL: Background to The Technical Dimensions

8. **Managing plant health.** As WTO members,[8] the implementation of the phytosanitary provisions of the SPS Agreement is currently guided by some 32 International Standards for Phytosanitary Measures (ISPMs, developed by the International Plant Protection Convention - IPPC). Adoption of SPS international principles primarily demands phytosanitary measures in trade be justified by risk-based decision-making. The SPS Agreement also demands that measures should be proportionate to the risk they address. Science-based risk

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excess of legal limits; (v) Sudan red additives (illegal colorants); and, (vi) melamine in food; Examples of animal health hazards include: (i) Highly Pathogenic Avian Influenza (HPAI); (ii) Newcastle Disease (NCD); (iii) Food and mouth disease (FMD); (iv) Porcine Reproductive and Respiratory Syndrome (PRRS); (v) Classical Swine Fever (CSF); (vi) Rabies; and, (vii) Anthrax. Examples of plant health problems include: (i) Coconut hispid beetle; (ii) Corn flee beetle; (iii) Brown Plant Hopper; and, (iv) Fruit flies. (NB. The causes of hopper outbreaks are disputed; some experts claim that inappropriate use of pesticides is the main cause for outbreaks and those options for transboundary cooperation on phytosanitary interventions are limited. Also, the taxonomy of fruit flies is scientifically unclear and complicates transboundary work).

[6] The Disability-Adjusted Life Year (DALY) rate indicates the number of healthy life years lost per 100,000 because of mortality and morbidity caused by various diseases and other debilitating factors. [See http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/)

[7] Food Safety Situation* in GMS Countries, Japan and the USA; 2004

	Cambodia	China	Laos	Myanmar	Thailand	Viet Nam	Japan	USA
DALY/100,000	2,843	277	1,442	1,553	449	315	28	33

Note: * Approximated by loss of healthy life because of diarrheal diseases.
Source: Global Burden of Diseases (2004 update), Estimated DALYs per 100,000 population, Geneva, 2008 http://www.who.int/healthinfo/global_burden_disease/gbddeathdalycountryestimates2004.xls

[8] Lao PDR is currently in the process of WTO accession.

management requires knowledge of the pest status of a crop commodity, together with associated production information. Country phytosanitary capacity and management is therefore dependent on available resources to undertake pest surveillance, pest diagnostics and to develop pest lists, support risk analysis and risk management requirements**.**

9. Forest products figure importantly in GMS trade; notably (and with the exception of Thailand) China's import of logs and sawn timber from its GMS neighbors has shown an increasing trend. The large volume of formal and informal border trade in these products, the long and porous borders between GMS countries, and contiguous forests across national borders pose enormous threats to the transborder movement of forest pests and diseases. Most GMS countries (apart from China), and especially Cambodia and Lao PDR, pay scant attention to forest pests and diseases. There is an urgent need to mainstream forest health into national SPS compliance programs, including creating the necessary awareness of the importance of forest health information in trade, generating forest pest lists, and engaging with forest health professionals in national phytosanitary activities.

10. Human resources are the most important element lacking in the CL countries in terms of pest diagnosis capacity.[9] The lack of human capacity in these countries is compounded by the lack of appropriate diagnostic equipment and laboratory facilities. While CL are each aware of the concept of pest-free areas, places and sites of production, they look for guidance on implementation of these, and/or are not able to address the monitoring surveys and record-keeping requirements consistent with maintaining such pest-free areas.

11. There are major concerns in GMS countries that invasive pests will migrate from tropical member countries to China and from temperate areas in China to tropical countries. In the absence of robust empirical databases and risk analysis these concerns can easily lead to over-reactionary precautionary measures that needlessly hamper trade. Moreover, these unspecified concerns might allocate control capacities thinly to high-risk and low-risk commodities alike. A better understanding of common phytosanitary risks in GMS would enhance trade and help forest protection in the region.

12. **Managing animal health**. The GMS has several transboundary animal diseases (TAD) and many related quarantine and trade constraints that limit formal trade. There is general agreement among animal health specialists that the most effective way of containing transboundary diseases[10] is through early detection of outbreaks through passive and active surveillance and consequent rapid response.

13. Regional cooperation is important for delivering cost-effective results; disease-free zones can be created and gradually expanded as steps in eradication of diseases, for example. However, there are no quick fixes, and present capacities and resources for applying such policies are generally constrained. Moreover, benefits and costs between countries and different social groups can diverge significantly - without proper incentives it is difficult to implement such policies. For all these reasons, disease eradication is complex, and progress is frequently slow.

14. A strategy of disease containment and eradication is best supported by movement control and border quarantine procedures. However, the contribution of stand-alone border measures to the control of animal diseases is limited. There is a lot of informal border trade along the long porous borders, especially of bovine animals. Transboundary animal

[9] The national plant protection organizations of CL are staffed largely by agronomists, who have benefitted from recent capacity-building programs under both NZAID, and AusAID.

[10] Such diseases Include foot and mouth disease (FMD), classical swine fever (CSF), highly pathogenic avian influenza (HPAI), haemorrhagic septicaemia (HS), porcine reproductive and respiratory syndrome (PRRS), Newcastle's disease (NCD) etc.

movements are driven by differences in prices; since most public quarantine measures are costly to owners of animals and tend to increase price differentials, they also increase the incentives for smuggling. As an example of a possible way ahead for the region, Thailand is experimenting with private sector-managed quarantine stations under public oversight, mainly along the Myanmar border, with the aim of reducing the cost of quarantine to traders. This method allows traders to fatten quarantined animals. Although this is a promising tool in cross-border disease control and is compliant with OIE principles, other countries have not yet followed this model,[11] partly because of legal constraints and also because of unwillingness to leave control tasks to the private sector.

15. Over the past years there have been many FMD outbreaks in Cambodia, allegedly because of increased imports. There is a draft plan and strategy for foot and mouth diseases (FMD) control, but it is not yet being implemented because of lack of funds. Vaccination is in short supply and irregularly available from public and international sources (and is mainly applied in case of outbreaks). Culling is not practiced for FMD and other diseases - except for HPAI. Each village has a paravet with the responsibility for reporting early signs of outbreaks, and it is the responsibility of the district veterinary officer to start the process of investigation once outbreaks are reported. Deficiencies reported with such processes include low incentives for paravets - because of lack of funds to pay for their cost of travel and per diem, and a lack of knowledge about biosecurity (which occasionally has resulted in paravets spreading disease). The contribution of the long-term regional SE Asia China Foot and Mouth Disease Project (SEACFMD) has been useful in providing a network, training and forum for meetings in Cambodia, but does not provide budget resources. For poor farmers in Cambodia the more important diseases are *haemorrhagic septicaemia*, porcine reproductive and respiratory syndrome (PRRS), CSF and NCD (because of the resultant death of animals), while for traders and commercial farmers, the constraint placed by FMD on the significant amounts of bovine exports makes it a top priority. RGC, in the absence of information about the relative economic impact of these diseases, tries to address all.

16. In Lao PDR, constraints for implementing FMD controls are more binding. There is still a weak legal and regulatory framework and no comprehensive animal disease management plan with adequate funding for FMD. There are only 50 trained veterinarians in the country, of whom 30 are in government service, and two paravets per district. Large-scale preventive vaccination is not practiced because of its cost and complexity. Although occasionally culling is practiced in case of disease outbreaks, there is no compensation for farmers. There have been reduced numbers of FMD outbreaks over the past few years, though causality with SEAFMD support is not proven, and may simply be related to change in movement of animals.

17. **Managing food safety.** In the area of food safety, requirements in most countries are tightening, being driven by increased consumer awareness, urbanization, modern lifestyles, food scares and scandals, and responses by regulators and food companies to food safety incidents and more generalized public concerns. The trend around the world in food control systems is that private-sector entities carry the basic responsibility for producing and marketing safe food, whereas government provides guidelines, supplies oversight and ensures enforcement. The farm sector can use Good Agricultural Practice (GAP), and processing enterprises can adopt Good Hygiene Practice (GHP), Good Manufacturing Practice (GMP) and quality and safety management systems based on HACCP[12] to meet basic safety requirements. Governments and private-sector entities can enhance the

[11] Cambodia is looking at such a method for live animal exports to Viet Nam to enhance their live animal trade and increase transshipments between Thailand and Viet Nam.

[12] Hazard Analysis and Critical Control Points [http://sop.nfsmi.org/HACCPBasedSOPs.php

introduction of such systems and develop certification systems.[13] Such systems generally need access to laboratories for process control and conformation tests. Where such systems are in place, public inspection rates can be low.

18. This kind of approach works well in developed countries where consumers and retailers demand safeguards for the products they buy and where supply chains are organized by bigger enterprises. However, developing countries (including CL) tend to be characterized by multi-tier market systems, with different food safety management issues in each market tier.[14]

19. Trade between CL and GMS countries consists mainly of 'tier 2' and 'tier 3' market segments; this means that demand for application of private assurance schemes for most traded products is either weak or absent. The public role here can be to strengthen private-sector safety management in 'tier 2' enterprises, and to try to pull more enterprises from 'tier 3' into 'tier 2'. In CL, 'tier 2' markets are still small; most export products from Cambodia and Lao PDR are unprocessed plant products with low or modest SPS requirements, and few companies export to 'tier 1' markets.

20. There is a tendency in DMCs to require supply chain control and traceability on imported products; this will generally imply that small-scale farms/enterprises in 'tier 3' are excluded; this practice may be questionable vis-à-vis WTO non-discrimination principles, since such requirements are not imposed on domestic producers. China is notable in having market access requirements that affect market access for tier 3 producers from other GMS countries.

21. **Surveillance, and risk analysis.** Increasing regional economic integration and trade expansion require the application of surveillance and risk analysis and risk management practices. However, knowledge about application of international standards is still limited.[15] Transparency in methods used, openness in sharing information, setting up surveillance systems with science-based sampling are still to be improved in CL. Diagnostic capacities

[13] The roles of government and private enterprises differ for food safety, plant health and animal health. Most individual enterprises don't need much specific capacity for dealing with phytosanitary and veterinary quarantine requirements; for market access they depend mainly on capacities of veterinary and plant quarantine services. Only seed and feed companies and companies with commercial breeding stock for export need special capacities in these areas. Food safety, on the other hand, requires more capacity within individual companies. However, much depends on the kind of product they are dealing with and the market segment they are serving.

[14] A broad categorization of differential food product types may make use of three tiers. The *first tier* is the demanding export market segment, mainly selling in OECD countries. In this market segment demand for safety assurances (including traceability) is high, and non-complying suppliers are excluded by buyers. Supply chain controls in this segment are mainly carried out by the private companies and are similarly as effective as in OECD markets. Generally, the buyer pays a price premium for compliance. In this segment it suffices for Governments to play a facilitating and supervising role. The *second tier* is the emerging domestic modern market segment, consisting mainly of supermarkets, restaurants in the tourist industry and international fast food chains. In this segment market demand for safety assurances is still weak, because the product price is still the main factor in competition and market access. Private enterprises struggle to recover the cost of supply chain coordination. Here the Government can lower the threshold by supporting the adoption of GHP, GMP, GAP and HACCP-based quality and safety management systems, and by controlling the safety and quality of agrochemicals and feed. This market segment is growing in all developing countries, driven by urbanization and modern food retail chains, but it constitutes still a relatively small share of food sales. The *third tier* is the traditional food market without supply chain coordination and mainly small-scale informal players. By volume of trade it is still dominant in all developing countries. There is generally no price incentive for safety assurance systems such as GAP, GHP, GMP and HACCP. The main role for Government in this segment is to prevent supply chains from becoming tainted with pathogens, residuals of banned pesticides and veterinary drugs and dangerous chemical substances, and to prevent unsafe substandard food entering the market. Given the large number of small enterprises, the complexity of these markets and weak public capacities, most Governments can only effectively control a limited number of hazardous risks. (See Van der Meer and Ignacio 2007).

[15] For example, although China has strong technical capacities it still has a backlog in transition and harmonization with international standards; the standards of a planned economy, as originally developed in the USSR, are based on principles different from those of the WTO.

are a bottleneck, especially in plant pest surveillance, because of the steep learning curve. Active surveillance is expensive because of the required fieldwork, and therefore a critical consideration of CL is what minimum level of public funding for staff, testing and surveys is justifiable. Passive surveillance has limitations, but since it is cheaper than active measures it is important to identify a proper balance of active and passive surveillance. In investment efficiency terms, improved passive surveillance can reduce the need for active surveillance measures.

22. Applying risk analysis effectively is a learning process; it can be of low use to regulators and costly for trading partners if applied in too rigid ways. No country in the world conducts formal risk analysis for all imported agri-food products, since it would be too expensive. Instead, risk profiles are used that classify products in groups for which different requirements exist. Full risk analysis is usually practiced for market access of high-risk products. Not uncommon is to apply 'simplified assessment of risk', or expert judgment, as a base for risk management decisions; for many products, market access restrictions are *de facto* waived because the inherent risks are considered negligible. In many cases, countries can make use of risk analysis done already by other countries.

23. In general, more important than applying formal risk analysis by specialized teams is to adopt risk-based decision making in managing food safety, plant health and animal health. This requires systematic collection and analysis of data on food safety, pest and disease incidence through inspections, interceptions, active and passive surveillance, and (last but not least) from the Internet. In Cambodia and Lao PDR this work has not started..

24. **Diagnostics and testing.** Diagnostic and testing facilities are necessary to support pest and disease identification, market surveillance, inspection, and risk analysis. Conformity testing is necessary for private enterprises in 'tier 1' markets, but less frequently applied in 'tier 2', and not at all in 'tier 3' markets. For international recognition of tests generally, ISO/IEC 17025 accreditation is considered necessary for food, chemical and veterinary laboratories,[16] although variously lesser requirements such as Good Laboratory Practices (GLP) or other test methods may also be accepted. Trust in laboratory systems is basic for accepting the safety assurances of products and information about the food safety, plant and animal health situations in a country. Harmonization of test methods is necessary for economic integration and for enhancing trade. ASEAN pursues accreditation of laboratories and has leading laboratories selected as reference laboratories.

25. To achieve and maintain accreditation is difficult. In Lao PDR and Cambodia the incentives are low because of minimal demand for testing by private enterprises and the low government funding for regulatory work. Much technical training is needed, and the organization and discipline of laboratories have yet to meet high standards.[17] The cost of accreditation and other fixed costs are considerable and, therefore, sustainability of accreditation is unlikely for laboratories with low funding. Moreover, with a low number of tests it is difficult to maintain skills of laboratory staff.

26. For many testing and diagnostic functions, alternatives to the use of domestic public laboratories are available. There is increasing availability of rapid test kits that can be used in decentralized locations and for initial screening; only if a test result is positive is full analysis in a regular laboratory is warranted. Using private and foreign laboratories is also often possible.

27. Accreditation does not mean that foreign buyers accept a laboratory's tests; some private sector schemes (such as Global GAP), require food safety conformity testing by

[16] ISO accreditation for plant pest diagnostics is still less common.

[17] Many laboratories in the region that proudly advertise their ISO/IEC 17025 accreditation don't apply some of the basic principles of the standard.

independent (i.e., non-government) laboratories. Use of laboratories abroad can be the best technical solution, especially for expensive chemical tests on food, but it also has limitations. Governments don't like to be dependent on foreign laboratories in cases of political sensitivities and with risks to rapid accessibility. (In the case of biosafety risks, the dispatch of samples may even be prohibited). As a possible solution for CL, the model of mobile laboratories for food safety (conducting a series of rapid tests and serving as an alternative to decentralized investment in laboratories) on the Thai model may be appropriate. Mobile units can also be used for dissemination of knowledge and creating food safety awareness at the village level, for surveillance and rapid tests for animal diseases, and they can add value to plant pest surveys.

28. **Import handling.** Although the main solutions for better SPS management are generally not located at borders,[18] there are at present specific constraints on CL borders that deserve improvement. For example, some major border crossings in the economic corridors (North-South, East-West, and Southern) lack basic office space for quarantine officers and lack facilities for them to communicate to their head office. A selective number of improvements of buildings and equipment (including IT) could be useful in these cases, but since inspection manuals are generally inadequate and training is insufficient, future upgrading should include more than hardware alone. In areas of high cross-border animal movements, such as between Thailand and Cambodia, Thailand and Lao PDR, and between Viet Nam and Cambodia, establishment of quarantine stations could be considered (but governance issues, transaction cost management and private sector participation also need to be addressed). Most deficiencies in customs and quarantine handling generally derive from weak capacity and behind-the-border constraints; poor coordination among the various agencies responsible for border handling may cause some unnecessary delays in border clearance, but are not a dominant problem.

29. **Controlling the use of pesticides and veterinary drugs.** The use of pesticides and veterinary drugs can impact on the health of consumers and also affect market access.[19] Adulteration of pesticides and veterinary drugs can also cause a risk to the health protection of crops and livestock. Progress is being made in Thailand, Viet Nam and PRC to improve legislation, to forbid dangerous products, and to strengthen control of registration of producers and traders, quality of products, market surveillance and control of use, etc. As a result, it is expected that producers who cannot sell their products any more in domestic markets will try to divert their sales to less controlled markets. In this regard, Cambodia and Lao PDR have very weak capacities to control the marketing and use of agrochemicals - they have no effective legal and regulatory systems in place, hardly any testing capacities and no adequate surveillance programs. With commercialization of agriculture, use of agrochemicals in these countries is increasing, and there are signs of increasing deficiencies

[18] Traditionally, AFF products could move freely across borders of CL countries, provided that taxes had been paid. The emergence of quarantine services on the border adds payments and imposes controls that have a limited effect from a health perspective. Adoption of WTO principles, harmonization and requirements of trading partners may imply more SPS controls on the borders, but in fact border controls are only part of the overall control systems for food safety, plant health and animal health, and not the most important parts. The experience of large common markets, such as the EU, but also of large countries such as the US and China, shows that efficient control of plant and animal pest and diseases and food safety depends primarily on surveillance and prevention. Border controls are second-best measures and should deal with risks that cannot be dealt with effectively in other ways. The lesson for ASEAN, GMS and CL is that economic integration and harmonization of SPS measures within the global framework of the WTO SPS Agreement should gradually result in a shift of controls away from borders to production locations, enterprises and supply chain control. In the meantime, border controls should focus on paper and visual checks, and effective inspections for prioritized hazards, based on both known and identified new risks. This is in line with general experience that controls of end products provide insufficient protection and have to be replaced by controls on critical points in the supply chains.

[19] There have been bans on exports from GMS countries, and shipments destroyed, in Japan and the EU because of the use of banned pesticides and forbidden growth enhancers and antibiotics.

in use in agrochemicals. There is a case here for regional capacity building and for application of common regional standards.[20]

30. **Controlling feed, seed, and propagation material.** Agricultural inputs can bring contaminations and pests and diseases in the food chain. Illegal additives in feed (such as forbidden growth enhancers and antibiotics) and chemical contaminations (such as dioxine and aflatoxin) can result in serious food hazards. Moreover, feed can carry zoonoses and pathogens for animal health. Seed and propagation material can carry plant pests and diseases, and there have been many instances where pests and diseases have been introduced into countries through imported seed and propagation material. International good practice is now to treat feed, seed and propagation material as high-risk imports that need screening and control. Capacities in these areas in Cambodia and Lao PDR are virtually absent or ineffective at present. There is a risk that increased commercialization and globalization processes both introduce hazards from other countries (e.g., by unscrupulous traders or ignorant travelers etc), and even that such hazards may spill over to other countries in the region, and hence a concomitant urgency to improve the situation.

31. **Improving food safety in the tourist industry.** There is a specific SPS issue regarding the tourist industry, in that in each of CL there are hundreds of small and medium sized enterprises engaged in serving the tourist sector with food; they are mainly restaurants and hotels, some food processors and also farmers and traders who supply them with food. Food hazards are an inherent reputational risk to the tourist sector (both national and regional) - and hence safe food is a factor in competitiveness.[21] The first responsibility for serving safe food is with private enterprises, but there is a public role here in assuring minimum standards and in helping enterprises to upgrade. Upgrading can be achieved through raising awareness, providing education and training, the adoption of GHP, and by increased investment in upgrading facilities. Special attention can be given to promote coordinated supply chains that can assure safe food sourcing from farms. Incentives could be strengthened by introducing a rating system for restaurants based on their capacities for securing safe supply of food (as measured by GAP, GHP and GMP).

32. **Strengthening regional/international dimensions of SPS management.** SPS capacity building is foremost a national challenge for each CL country, but long and porous national borders and similarities in agro-ecological conditions and food systems make these countries and their GMS neighbors highly interdependent. Because of the risks of spillovers, individual/national solutions to transboundary agricultural health and food safety hazards are difficult to achieve and expensive to implement effectively without cooperation from GMS neighbors. However, countries lack confidence and trust in each other's capacities and they lack familiarity with each other's systems. Moreover, since the costs and benefits of certain measures (e.g., regarding transboundary animal diseases) differ between countries and social groups, dialogue about funding may be an under-attended aspect of regional cooperation. There is therefore considerable room for GMS countries to improve exchange of information on pests, diseases and food safety hazards, and thus to create confidence in each other's measures and to meet general recommendations of reporting under the international framework of WTO SPS, Codex Alimentarius, IPPC, OIE, ARASFF[22] and WHO's INFOSAN etc. Monitoring and surveillance could add much information for exchange

[20] For example, at present there is no control on quality of exported agrochemicals from China and Viet Nam to their GMS neighbors.

[21] Most of the tourist sector can be considered a 'tier 2' market for food, which means that there is a commercial interest among enterprises to make efforts for food safety.

[22] Information exchange on food safety alerts has a special dimension. A voluntary ASEAN Rapid Alert System for Food and Feed (ARASFF) is being developed for ASEAN, led by Thailand with EU support. China has a national RAS version already. It will require much dialogue and harmonization agreements among GMS countries to make it a useful operational tool for food safety regulators. Synergy should be sought in data collection for ARASFF and INFOSAN.

among GMS countries. Bilateral cooperation among GMS countries concerned with exchanging information about each other's SPS systems, health information related to trade flows, concerns about spillover of health hazards, technical assistance, and coordination of policies is useful, and can be a building block for wider regional cooperation.

33. SPS capacity building is complex and costly, CL have turned to international agencies and donors for support. A research study of SPS-related technical assistance conducted for the Standards and Trade Development Facility (STDF)[23] identified for the period 2002-2006 about 150 projects with a project value of about US$400 million providing support for CL.[24]Such project investments cover animal health, plant health, food safety and laboratories, and many have a regional focus. The general impact of these SPS support projects has been mixed. The design of many projects has not been based on sufficient needs analysis, and in the absence of an established body of good practice much effort has been driven by the preferences of technical specialists - little attention has sometimes been given to absorptive capacities, nor to the requisite conditions for sustainability. Similarly, because donor preference has often dominated, some areas have received over-much support whereas others have been ignored. There is now better understanding of the remaining technical gaps in SPS capacity building, and lessons can be drawn from recent experience about success factors for further support. One obvious yet important lesson is that projects that combine TA and training with institutional development and hardware investments are likely to be the most effective SPS capacity building interventions.

4. SPS Issues in CL: Background To The Financial And Human Resource Dimensions

34. **Financial sustainability of SPS systems.** A fundamental dilemma for creating SPS management capacity in DMCs is the fact that designing and implementing surveillance and testing systems (for plant health, for animal health, for food safety) that meet international standards is expensive. Moreover, and even more of an issue for designing sustainable development assistance, the recurrent costs of SPS systems are relatively high (compared to many physical infrastructure or social sector projects, for example). This poses a major problem for governments that are already typically stretched to provide the most basic of public services and which must try to meet any operational costs (e.g., for surveys, for laboratories) beyond the paying of staff salaries.

35. A recent study[25] of the operational costs of trade-related SPS systems in Lao PDR estimated that US1 million was needed annually to cover the annual costs of a minimum-sized SPS system.[26]This compares to – for example – a present budget for these activities in Lao PDR of around $50,000 (i.e. one twentieth of what a functional SPS system requires). In Cambodia (where the capital hardware stock – in terms of laboratory sizes and stock of equipment - is typically larger than Lao PDR), the operational funding situation is even worse; as an example, the Royal Agriculture University is entirely dependent upon donor and partner funding to do any research at all, or to maintain its laboratory equipment.

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[23] The Standards and Trade Development Facility (STDF) is a coordinating and funding facility for SPS capacity building. Established by the FAO, OIE, WHO, World Bank, and WTO, it assists developing countries with capacity building and technical cooperation on SPS issues. WTO hosts the secretariat.

[24] Ignacio, (2007). It needs to be emphasized that many of these are regional projects (ASEAN, APEC) and the indicated funds cover other countries as well, and many of the projects have a focus broader than SPS; in several cases SPS is only a small component.

[25] Lao PDR: '*Operational Costs Of trade-related SPS Systems'* World Bank (2010)

[26] Operational costs per year are indicatively about US$200,000 for a "minimum-size" food laboratory US$75,000 for an effective plant quarantine unit, and US$100,000 for a pesticide quality control unit. A recent World Bank report estimates that about US$ 1 million per year would be needed to cover operational cost of a minimum sized SPS system (World Bank 2010).

36. Project costs estimation for trade-related SPS capacity building in CL indicates that – on average, and across all areas of SPS systems – recurrent costs are likely to be around one-quarter of total investment costs; the implied burden on CL governments to maintain capacity after the investment phase is thus considerable. Whereas donor grants and investment funds can often be found for creating SPS capacity, and can be traditionally justified in terms of such support being needed until capacity is established, there is realistically no alternative in the longer term to national funding for the use and maintenance of whatever capacity has then been achieved. In this respect, it is important to note that no country has established an effective SPS system without sustained funding of operational costs.

37. Prolonged public funding is unavoidable because the services involved in surveillance (of plants, animals and food) are typical public and quasi public goods for which cost recovery possibilities are very limited. Moreover, private demand for food testing services in DMCs is very low (tier 2 and 3 markets) - meaning that laboratories have very limited possibilities to earn fees from the private sector. There are policies in CL to use regulatory powers as para-fiscal instruments to generate income for public services, but these practices can have serious down-side effects on the cost of doing business and cost-effectiveness from the perspective of promoting food safety.

38. The SPS costs problem is also generally compounded for smaller countries, where budgets can be too small to reach the critical mass necessary to acquire and maintain specialist functions. This can be the case for: (i) expensive equipment for tests with small annual volumes; (ii) for risk assessment for registration of pesticides and veterinary drugs; and (iii) for risk assessment in granting market access for new products. Obviously, small countries may be able to take advantage of work done by bigger countries: if a product has gone through public scrutiny in an advanced country the risk of basing decisions of registration and granting market access on such previous work elsewhere should be low. Harmonization of standards and mutual recognition of procedures (e.g., within GMS, within ASEAN) can thus be very beneficial for smaller countries in terms of cost reduction.

39. The regional dimension of SPS capacity building also includes the possibility to recover some operational costs of smaller countries' systems from those trading partners who will experience positive externalities benefits from SPS improvement in the weaker countries. Such benefits may accrue in the obvious and tangible forms of volumes of produce now being available which previously were not (e.g., because pest lists have been developed and accepted as credible), and also because of an improvement in regional reputational risk (e.g., because non-GMS trading partners or tourists believe that overall GMS product and tourism performance has improved as a result of improvement of weaker members).[27] The possibilities to capture and monetize these benefits can be explored through existing bilateral and multilateral arrangements, but depend in the first instance on their realization and identification (e.g., through robust project investment monitoring and evaluation).

40. **Human resource dimensions.** Finance is not the only constraint for building SPS management capacities. Highly skilled specialists are needed for conducting surveillance, diagnostics, testing and risk analysis. In Lao PDR and Cambodia there are serious shortfalls in the human resource base for these functions, due to all of: (i) the small size of these countries; (ii) their recent political history; (iii) their low level of economic development; and, (iv) the novelty of WTO SPS requirements. Although some SPS capacity constraints can be solved by the provision of training and scholarships, abroad the longer-term and more sustainable solution is to educate more specialists in food safety, plant health and veterinary science (with a strong agri-food basis) in domestic universities. This is likely to require

[27] These possibilities are examined in more detail in the Economic Analysis.

upgrading of teaching facilities (e.g., laboratories, classrooms, equipment), academic curricula, and exposure to more modern SPS expertise (through international and regional experts) and materials (current academic literature, WTO and other technical SPS documentation), as well as enhancing the relationships between universities and government agencies.

41. An important point to note in relation to human resource dimensions and the desirability of establishing SPS capacity at domestic institutions is the specialist nature of SPS services. Long-term specialists constitute the core of SPS institutions; knowledge-sharing (through research, dissemination etc) and networks with specialists and institutions abroad can only be successfully maintained by specialists in robust and stable institutional environments. Rapid rotation of staff can be detrimental to the build-up of capable institutions, and so it is appropriate to focus investment support on developing a cadre of domestic SPS expertise at selective technical and academic institutions only.

4. Summary of SPS System Problems And Outcomes

42. Given this background description covering the trade and health contexts, and also the technical and human resource conditions associated with SPS systems, it can be seen that the **core sector problem across CL** is that actual implementation of SPS practices is weak, and this is primarily because of weak capacities in monitoring and surveillance, an inadequate supply of SPS specialists, and poor harmonization and coordination with international requirements (including with respective CL countries' GMS neighbors).

43. In turn, a range of financial (e.g., lack of operational budget), planning (i.e., no annual programs), physical (e.g., lack of testing capacity), institutional (e.g., poor awareness), human resource (e.g., low education levels), and knowledge/information (e.g., limited international/regional contacts) conditions contribute to these conditions.

44. The CL SPS situation is summarized in the **Problem Tree** in Figure 1, over.

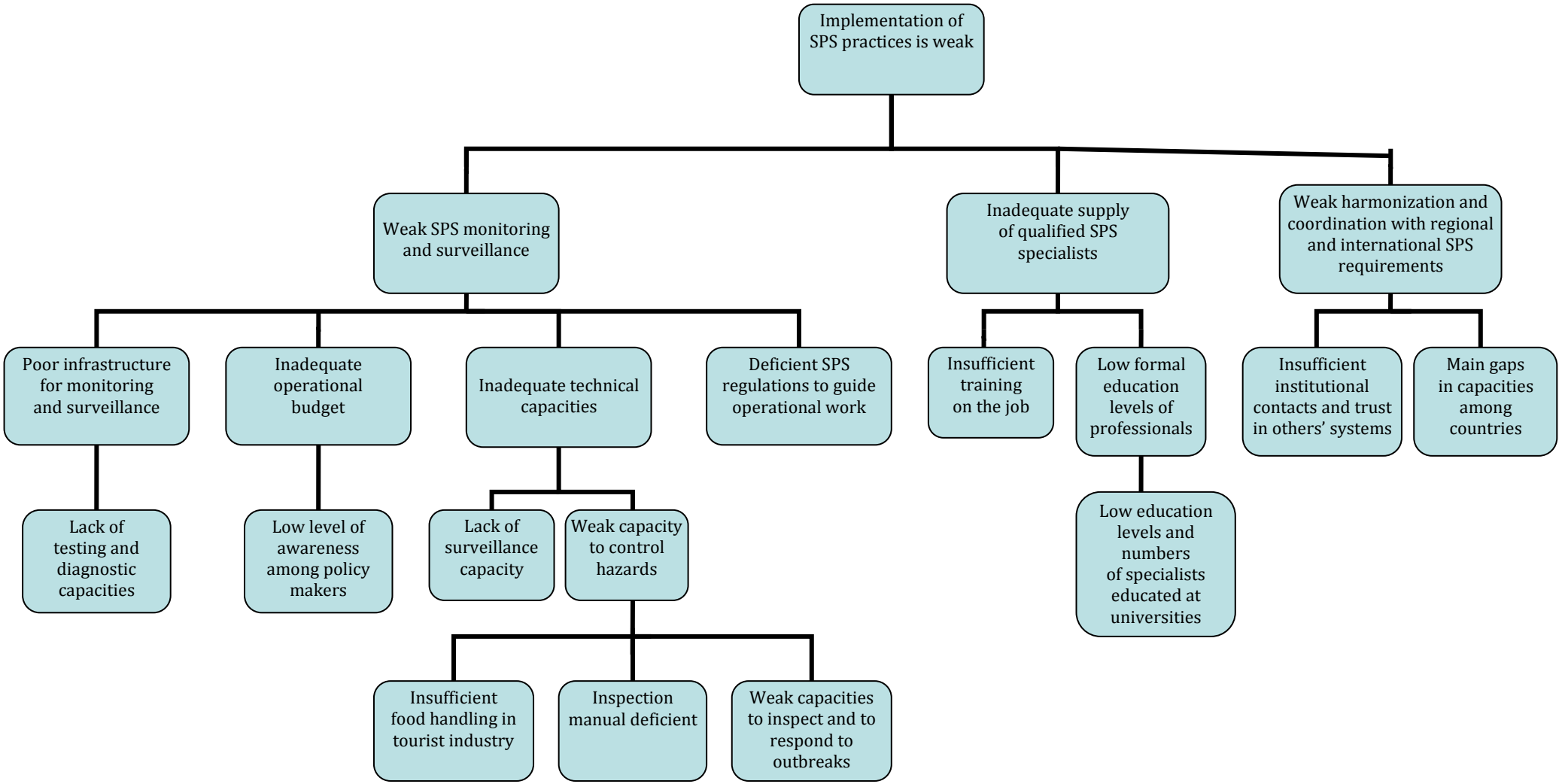
45. As a result of this level of SPS capacities in each of the CL countries, the observable present consequences are therefore:

(i) plant pests which seriously affect productivity and incomes of farmers. With increased reliance on higher value crops and new varieties, and given the existence of larger scale operations for exports, the risk here is that trade will be disrupted by increasing incidence of outbreaks. Forest plant health is also currently not mainstreamed in the SPS compliance process at all – again, another significant source of risk;

(ii) the existence of a number of endemic livestock diseases, such as Highly Pathogenic Avian Influenza (HPAI), Foot and Mouth Disease, Classical Swine Fever, Newcastle's Disease, and various other animal diseases which collectively impede formal trade and reduce the income of farmers (several zoonotic diseases are also inherent risks for human health); and,

(iii) an incidence of food and water-borne diseases that is much higher than in OECD countries other countries of Southeast Asia, and which causes high mortality and high costs to households (because of inability to work and through expenditures on medical treatment).

Figure 1: CL SPS SECTOR PROBLEM TREE



Annex 1: GMS AFF Trade

1. The GMS AFF Trade: Growth and Composition

1. Exports and imports of GMS countries are growing more than the average around the world, driven by rapid economic growth and increasing incomes. Over the period 2000 to 2009, total exports of GMS countries grew over 400% overall, and in all GMS countries growth of exports to GMS countries grew as fast as or faster than total export growth. GMS countries' AFF exports grew 120% in value over the same period. As a result of these growth trends, the share of GMS countries in total world exports and imports nearly doubled between 2000 and 2007 (to about 11.5% of world trade). GMS AFF exports more than doubled in nominal terms, and imports trebled (as the demands for raw materials originated from rapid economic growth in the subregion). (See Tables 1 and 2).

Table 1: Trends in World and GMS Exports

	2000	2009
Value (Billion US$)		
World:		
Total trade	6,290	12,054
Total AFF	384	844
Food & live animals	329	742
Non-food	55	102
GMS:		
Total trade	334	1,411
Total AFF	29	74
Food & live animals	25	65
Non-food	3	9

Table 2: Trends in World and GMS Imports

	2000	2009
Value (Billion US$)		
World		
Total trade	6,463	12,163
Total AFF	414	859
Food & live animals	349	741
Non-food	65	118
GMS		
Total trade	304	1,209
Total AFF	15	58
Food & live animals	8	25
Non-food	7	32

2. Total recorded trade among GMS countries has been intensifying; exports by GMS countries to other GMS countries have been growing faster than exports to non-GMS countries. The share of exports to GMS countries has increased especially in the case of AFF products. With AFF, this trend is strongest in non-food items. (See Tables 3 and 4).

3. About 60% of GMS total AFF exports are food and live animals, and the remainder non-food agriculture and forest products**.**

Table 3: GMS Exports 2000-2009 by Year and Destination

	2000	2009
Value (Billion US$)		
Total trade	*336.4*	*1423.0*
GMS	12.2	71.7
Non-GMS	324.2	1351.3
Total AFF	*29.7*	*76.9*
GMS	2.0	9.3
Non-GMS	27.7	66.6
Food & live animals	*25.9*	*67.2*
GMS	1.2	5.4
Non-GMS	24.7	61.8
Non-food	*3.8*	*9.7*
GMS	0.8	3.8
Non-GMS	3.0	5.9

Table 4: GMS Imports 2000-2009 by Year and Origin

	2000	2009
Value (Billion US$)		
Total Trade	*308.0*	*1224.6*
GMS	14.0	82.5
Non-GMS	294.0	1142.1
Total AFF	*15.5*	*58.9*
GMS	1.7	8.0
Non-GMS	13.9	5.9
Food & live animals	*7.7*	*26.5*
GMS	0.8	5.1
Non-GMS	6.9	21.5
Non-food	*7.8*	*32.4*
GMS	0.9	2.9
Non-GMS	6.9	29.5

2. Overview of The AFF Trade of CL

1. Cambodia

4. **As regards exports,** agricultural products have a very small share in Cambodia's recorded merchandise trade. The main export is manufactures (predominantly garments and apparel). The value of Cambodia's agricultural food and live animal exports increased from US$23 million in 2001 to about US$119 million in 2009. This is growth, but it represents only about 2% of total exports in both years. The primary recorded food and live animal export products are fish and fish products to the US, and cashew nuts to Viet Nam. However, large amounts of unprocessed grain (mainly unmilled rice), fruits, vegetables and fish (mainly from the Tonle Sap) are exported without being recorded. Official fish exports peaked in 2004, with record-level export to the US (US$44 million) but then dropped in the following years. Cambodia exported about US$20 million worth of cashew nuts in recent years – mainly to Viet Nam – where the product is co-mingled with Vietnamese production for re-export. The

value of Cambodia's non-food agricultural export (rubber and wood) is larger that of food, and grew to over US$165 million in 2009. The main markets for these products are Viet Nam, other ASEAN countries, and China.

5. **As regards imports,** food and live animal imports comprise a bigger share (over 9%) of total imports than the percentage of food exports to total exports (about 2.5% percent) in 2009. "Sugar, sugar preparations and honey" is the primary food import - making up around 35% of food imports. Other important food imports in recent years have miscellaneous food (about 18%), cereals (mostly flour and starch, about 13%), dairy products (mostly milk – about 11%), and vegetables and fruit (about 9%). A fast-growing agro import is animal feed, which grew from US$1.5 million in 2001 to US$59 million in 2009. Thailand is the main source of food imports providing almost all foods including milk, fish, flour, vegetables and fruit, sugar products, miscellaneous food products and animal feed. Recorded imports of non-food AFF products are almost insignificant.

2. Lao PDR

6. **The value of food and live animal exports** more than tripled 2001-2009, and now comprises about 5% of all exports. Raw materials, rubber and wood, make up over 50% of total exports; total AFF exports are about $333 million. The primary agro-food products are coffee (close to 33% average share of total food exports), cereals (rice and maize - about 48%), vegetables and fruit (about 16%) and live animals. There has been a decline in the share of live animal exports from 28% to 6%2001-2009. Wood and wood products have always been primary export products of the country, with an average share around 15-20% of overall exports. For the past few years rubber exports have been growing rapidly; from a value of less than US$ 0.5 million in 2001 to over US$14 million by 2009. Investment by Chinese, Thai, and Vietnamese businesses in plantations and in smallholder-based commodity systems explains much of this growth. Rubber is expected to be a major future export.

7. Larger neighboring countries (China, Thailand and Viet Nam) are the main markets for Lao agro-food and raw material exports. The main agro-food imports of Thailand are maize, vegetables, such as cabbages, garlic and mushrooms, bananas, and preserved fruits. Thailand is also an important destination for Lao PDR wood and wood products. A significant share of Vietnamese imports from Lao PDR is coffee - again to supplement Vietnamese coffee exports. Europe is in most years the primary buyer of coffee (an average of about 70% of total Lao PDR coffee exports). In 2006, 14% of the value of Lao agro-food exports to Viet Nam came from coffee, 12% from maize, 31% from live animals, and 39% from rice. Viet Nam is likewise a main importer of Lao wood products, buying US$ 96 million worth (48% of Lao total wood exports in 2007).The primary agricultural and forestry products to China include wood, rubber, cereals and vegetables. A number of products are produced and exported to China under the opium poppy crop replacement program, and exported as informal border trade. Tellingly in the current project design context, there are currently formal restrictions on the import of fruit and vegetables, maize and rice due to lack of information on the pest and disease situation in Lao PDR.

8. **Imports of agricultural food products** make up over 8% of recorded total imports, on average. Main food imports are cereals, sugar products, vegetables and fruit and miscellaneous food products. Thailand is the primary supplier - providing significant shares of almost all food categories, mostly sugar products and miscellaneous food products. Non-food AFF product imports are insignificant.

3. Trade Concentration in The GMS

9. Trade concentration of GMS countries (i.e., share of GMS trade relative to total trade) differs considerably. For total trade it ranges from 2.8% for China to 80% for Lao PDR. For AFF exports, it is over 85% in each of Cambodia and Lao PDR. The average interdependency for non-food AFF is much higher than for food and live animals (about 39% and 8% respectively) across all countries. GMS AFF trade concentration on recorded imports from other GMS countries is higher than for exports; landlocked Lao PDR imports as much as 98% of its recorded imports from GMS, and Cambodia 88%.

10. Of most direct relevance to the current project context, however, is that, for all GMS countries, trade concentration for AFF has increased strongly from (on average) less than 7% in 2002 to 11% in 2009. For Cambodia and Lao PDR, total trade, total AFF trade, total food and live animals trade, and total non-food agriculture and forestry products trade categories have all grown faster[28] in respect of GMS countries than for trade with the world as a whole. The implication is that there is an increasing tendency for the GMS to become more economically integrated as regards production and consumption of these products, and thus the logic to improve SPS performance vis-à-vis AFF items is correspondingly intensifying. This logic to improve SPS performance applies irrespective of any changes in trade composition, and even if it is the case that it is the trade in unprocessed commodities which seem to have grown most in recent years among the GMS countries.

4. Trade in SPS High Sensitivity And Low Sensitivity Products

11. Although all AFF products have to meet sanitary and phytosanitary requirements of trading partners, some products face more costly and technically complex requirements than others (i.e., SPS high-sensitivity products, including live animals, meat, fish, fresh fruit and vegetables), and which contrast with SPS low-sensitivity products such as grains, beverage crops and most non-food products. For this reason, the relative importance of low- and high-sensitive SPS products in a country's trade will affect the technical requirements of SPS capacity development and also the costs of SPS systems' development. Some products may not require export certification, such as green coffee and processed rubber, but with increased importance of these crops risks for import and spread of diseases has increased much. It is fair to say that weak control capacities in one country form a risk for the sub-region.

12. The issues in dealing with SPS low-sensitivity products, although not technically complex, can be important from an economic perspective, and are still difficult to deal with for countries with low capacities (e.g., Cambodia and Lao PDR). Outbreaks of invasive new pests in, for example, rubber, forests, maize or rice can have major impact on production and trade of these products in the GMS. Since many of these products (notably the grains) have low unit values, inefficient handling and SPS processing may weigh heavily on profitability even without any outbreaks. Also the total compliance cost to the (small) country for several of these products, including forest products and rubber, may be high because of the large volume in trade. Countries with low SPS management capacities may be hard hit if trading partners ask for pest data for low-sensitivity products that are simply not available, or if trading partners impose risk-mitigation measures.

13. SPS high-sensitivity AFF exports from Cambodia and Lao PDR for 2009 are about 26% and 5% respectively. In Cambodia, growth in rubber and cereals account for high proportions of low-sensitivity products, in Lao PDR it is rubber and wood products growth, and also cereals (including rice and maize).

14. In terms of market destinations, Cambodia and Lao PDR both export overwhelmingly low-sensitive products to non-OECD countries.

[28] Or at least equal to in the cases of total AFF trade and non-food agriculture and forestry products in Lao PDR.

CAMBODIA:

SPS SECTOR ASSESSMENT

PART A: INTRODUCTION AND BACKGROUND

1. Introduction

1. This document summarizes the conditions surrounding SPS capacity in Cambodia, and provides a broad rationale for the proposed project investments.

2. Following this introduction, Part B provides a generic overview of Cambodia's SPS institutional and regulatory frameworks, and its national SPS system capacity (in terms of risk management and surveillance, and also regarding diagnostic capacity). The SPS capacity of the private sector is also briefly summarized.

3. Part C then focuses in more detail on each of the specific SPS subsectors of: (i) plant health; (ii) animal health; (iii) food safety; and, (iv) academic education. In each of these subsector analyses, the format is that constraints currently affecting performance are described in some depth, followed then by the various technical interventions which are proposed to ameliorate them.

2. Background

4. Cambodia's recorded AFF trade is small but growing. Garments, shoes and textiles account for 91% of Cambodia's exports, and agricultural food products and raw materials (which include rubber and wood products) make up approximately 6% of the country's total exports. The main agricultural commodities exported are rice, fish and fish products, cashew, maize and soybean. Informal[29] and uncontrolled exports of agricultural products are also considered significant.

5. The value of recorded AFF trade is growing rapidly; for example, the value of Cambodia's agricultural food and live animal exports increased from US$19 million in 2002 to US$119 million in 2009. Non-food agriculture and forest products increased from US$85 to US$165m over the same period.

6. An analysis undertaken[30] to identify export products having global market opportunities on the basis of Cambodia's competitive strengths identified beer, cashew nuts, cassava, maize, fish and fish products, rice, rubber, silk and soybeans. Potential future exports are fruits and vegetables, (including organics), mango, crude palm oil, soap products, pepper, and wood products.

7. In terms of its very broad national SPS priorities, RGC is keen to promote AFF production and trade – for example, as is manifest in the objectives of the national rice policy,[31] and also to ensure that Cambodia does not become a dumping ground for food products and agricultural inputs (e.g., pesticides, veterinary drugs) that cannot be sold elsewhere.

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[29] Large amounts of exports are not recorded, especially for fish and rice.

[30] UNDP (2007), *Cambodia's Updated Diagnostic Trade Integration Strategy* DTIS, Phnom Penh.

[31] RGC hopes that other primary crops may become more formal in nature and broader in their scope of trading partners once experience has been gained with achieving this for rice.

PART B: SPS SECTOR OVERVIEW

1. The SPS Institutional Framework

8. With accession to the WTO in 2004, Cambodia agreed to full implementation of its membership obligations by 2008. An inter-ministerial committee was established[32] to enhance the coordination of inspection. A Cambodia National Codex Committee (CNCC) was formed in 2001, and eight members have been appointed.[33] The Codex Contact Point is located within Cambodia Import-Export Inspection and Fraud Repression Department (Camcontrol) of the Ministry of Commerce (MoC) - which also houses the national SPS enquiry point.

9. Animal and plant quarantine measures are managed by the Department of Animal Health and Production (DAHP), and through the General Directorate of Agriculture (GDA) of the Ministry of Agriculture, Forestry and Fisheries (MAFF). A working group was formed[34] within MAFF to facilitate all affairs relating to WTO membership and SPS issues, with representation from animal health and production, crop production and crop protection, forestry, fisheries, agro-industry and agricultural legislation.

10. A summary of institutional SPS responsibilities in Cambodia is as follows:

(i) **Ministry of Agriculture, Forestry and Fisheries (MAFF):** The entry and exit of agricultural products supervision at the border by MAFF officials is limited. There is an inspection and quarantine facility for animal and plant products at Phnom Penh international airport, but limited facilities elsewhere. Since the avian flu outbreaks, DAHP has a presence at some of the border crossings. There are planned to be 71 animal and plant health checkpoints throughout the country. DAHP is responsible for inspection of animals and of animal products for export, and with the subsequent issuance of export licenses. DAHP issues import licenses for live animals and animal products.[35]GDA contains the Department of Plant Protection Sanitary and Phytosanitary (DPPSPS); its Director serves as the IPPC contact point. DPPSPS issues phytosanitary certificates, (although in future this will be the responsibility of a Phytosanitary Office). The Bureau of Agricultural Material Standards (BAMS) oversees the quality of agricultural materials (pesticides, fertilizers, seeds and planting material, veterinary products, feedstuffs and animal feed additives).[36]

(ii) **Camcontrol:** Responsibilities include: (i) food safety control; (ii) consumer protection; (iii) border control; (iv) export certification; (v) pesticide control; (vi) inspection of imported and exported goods; (vii) laboratory services; and, (viii) revenue collection.[37] Export inspection mainly covers garments and agricultural products, while domestically it undertakes surveillance of food products; its priority is smuggled food products. Legitimately imported food products are principally inspected for the type and condition of packaging, and for their expiry date. Camcontrol's monitoring program is aimed at preventing specific chemicals (e.g., borax, sodium hydrosulfite) and high levels of salicylic acid) entering the

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[32] "Establishment of an Inter-Ministerial Committee Coordinating Inspection of Quality and Safety of Products and Services" Sub-decree

[33] CNCC activities relate to policy on safety and quality of products and services, consumer protection and fair trade and to ensure coordinated action by relevant ministries.

[34] Decision 099SSRKSKB

[35] One license is needed for each country of origin and is based on risk assessment.

[36] This includes a business registration function, establishing quality standards, monitoring materials in the marketplace, and advising distributors/ suppliers on safe storage and handling of agricultural inputs.

[37] Inspection activities center on the import inspection of petroleum products, food, chemicals, garments and other commodities. Camcontrol is considered by MoC as the "technical arm" of the Customs Department.

food chain, and it tests for microbiological load/chemical contamination of domestically produced food.[38]

(iii) **Ministry of Health (MoH):** Has the responsibility for public health and food safety issues, including publicly traded goods. The Department of Drugs and Food (DDF) is responsible for food and drug control, and it is the ASEAN focal point on food safety. DDF consists of five Bureaux, namely: (i) Registration and Cosmetics Bureau; (ii) Essential Drugs Bureau; (iii) Pharmaceutical Trade Bureau; (iv) Drug Regulation Bureau; and, (v) Food Safety Bureau (FSB). The activities of FSB include: (i) food hygiene advice to restaurants; (ii) chemical and biological analysis of certain food products; (iii) risk assessment work; and, (iv) participation in Codex and ASEAN food safety matters.

(iv) **Ministry of Industry, Mining and Energy (MIME):** MIME regulates and inspects manufacturing industries, which include agro-based production activities. MIME inspects and samples foods and agro-based products for conformity and safety in order to issue product licenses. MIME inspectors from: (i) Institute of Standards Cambodia; (ISC) (ii) Department of Industrial Technologies; and (iii) Department of Water Sanitation (as well as sanitation authorities in the municipalities) visit manufacturing and agro-processing plants. ISC also has the responsibility to develop and issue food standards.[39] The Industrial Laboratory Center of Cambodia (ILCC) has two main testing laboratories at the same site: namely (i) the Food Microbiology and Chemical Division; and (ii) the Scientific and Industrial Metrology Division.[40]

2. The SPS Regulatory Framework

11. There are numerous official regulations (i.e., sub-decrees and ministerial decisions, or *prakas*) governing SPS activities in Cambodia. (The major such regulations are summarized - in chronological order - in Annex 1).

12. In general, there is considerable overlap in the administrative arrangements surrounding SPS measures, and in particular with those surrounding food safety. For example, the Law on the Management of Quality and Safety of Products and Services (LMQSPS) has wide application, and is the basis for inspection and regulating quality, safety and standards in the country. However, the law does not determine which ministry or agency has which role and at what stage of the supply chain. In particular, its Chapter 6 *"Inspection Procedures for Quality and Safety of Products and Goods and Service*" stipulates the setting up of (what became) Camcontrol, and only emphasizes cooperation between ministries, rather than laying out detailed responsibilities. This loose terminology in LMQSPS has led to RGC and ministries developing Decisions and Sub-decrees to widen as much as possible their respective individual responsibilities, which has caused overlap and duplication.

13. The recent (October, 2010) *Prakas* 868 aims to solve these problems of overlap and coordination in the food safety area, but its implementation still has to be worked out. Implementation would imply a significant effort to revise and update the existing legal and regulatory framework; there is no food safety law as yet, there are important gaps in the overall legal and regulatory framework, and there are needs for sharpening existing regulations to align with *Prakas* 868. There is an existing framework for coordination led by

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[38] The Department is the national contact point for the ASEAN Rapid Alert System for Food and Feed (ARASFF) Sub-decree No. 59 (May 2008)

[39] A total of 16 staff members have received staff training in one or a number of the following: (i) Auditor for Quality Management Systems (QMS) – the ISO 9000:2000 series (ii) QMS train the trainer for auditors (iii) HACCP auditor (iv) Auditor for Environmental Management Systems (EMS) – the ISO 14000 standard and (v) EMS train the trainer for auditors.

[40] ILCC has been supported by UNIDO and the ADB PED project to upgrade the facilities and testing procedures, and to work towards ISO/IEC 17025 certification for a number of microbiology standards.

MOC that has so far been inactive, and which *Prakas* 868 aims to make effective, but *Prakas* 868 itself does not imply significant institutional reforms. Although the country has a Standards Law and legal procedures for establishing national standards, virtually no use is made of it and there are hardly any standards for food safety. A main obstacle for standardization is that it requires cooperation and consensus among ministries involved.

14. Likewise, work on the preparation of pesticides and fertilizer, veterinary and phytosanitary laws is in progress - and will eventually require an array of regulations at different levels to implement the revised laws.

15. Overall, in most SPS areas in Cambodia, there is: (i) only limited integration in functionality between various government agencies; (ii) significant competition between agencies to acquire and retain authority to issue licenses, permits, accreditations, and to conduct inspections; and, (iii) only very limited willingness to share existing capacities (especially in laboratories) between agencies. More widely, there are stated concerns – domestically and internationally-expressed - about rent-seeking behavior in SPS operations generally and in agricultural inputs and food safety in particular, given that the rule of law still needs major strengthening.

16. All these features of the regulatory (and institutional) environment impact upon what can realistically be done to improve current SPS system capacity.

3. State SPS System Capacity

17. The underlying capacities of various institutions to manage SPS functions are still extremely limited in Cambodia. Across all institutions and functions, the most serious constraints are: (i) that there are no annual work programs of planned activities (e.g., for surveillance operations); and, (ii) virtually no recurrent budgets to carry out necessary activities. In several cases, such as for pest surveillance, animal health surveillance, food control (by Camcontrol) and control of pesticide formulations (by GDA), the existing equipment and trained staff are almost entirely underused because of lack of programs and recurrent funding, while in other cases, such as control of safety of animal products, veterinary drugs and pesticide residues, it is staff and physical resources that are lacking. This situation exists despite the significant support provided by donors to date.[41]

18. Regarding **risk management and surveillance capacity**, Camcontrol, MoH, MAFF and MIME are supposed[42]to establish clear, criteria for specific commodities, with any decision to inspect a consignment to be justified based on risk appraisal alone. Customs and Excise Department (CED) will call on other agencies when specialist expertise is required, with all specialized agencies evaluating import and export operations and procedures being required to publish interagency guidelines (after consulting with the private sector). Although meaningful risk management is still not conducted in aggregate, some progress in implementing a risk-based approach at the border has recently been made, viz.: (i) a list of prohibited/restricted goods has been agreed; (ii) service-level agreements between relevant agencies (CED, MoC / Camcontrol, MAFF, MIME, and MoH) have been concluded; and, (iii) some standard operating procedures have been agreed.

19. The food safety, plant and animal health departments each have responsibility for surveillance functions, but in practice they do not have the capacity and funding to undertake the work which is required of a modern SPS management system. Coverage of issues and products is presently sporadic; examples of risk assessment and surveillance work

[41] For details of donor support see *Action Plan*, table E1.

[42] Sub-decree No. 21 specifies inter-agency cooperation in risk management and avoidance of duplication. 'On the Facilitation of Trade through Risk Management' (March 2006).

undertaken recently include: (i) limited risk assessment has been carried out by FSB on raw chicken meat for Salmonella, on soy sauce (looking for the presence of 3-MCPD), and testing morning glory vegetable for microbes (Analysis of the samples was mainly undertaken in Viet Nam); (ii) A pest list is presently being developed for rice, with the help of NZAID, IRRI, CABI and ACIAR, but there are still obstacles because of limited expertise in taxonomy. A second priority crop for pest-list development is mango for export to Viet Nam (and in the future to Korea);[43]and, (iii) the National Veterinary Research Institute (NaVRI) undertakes AI surveillance funded by donors - for example there is an ongoing duck market surveillance program. The Department of Plant Health has collected many pest and disease samples and specimens. A draft quarantine pest list of over 150 pests and diseases is now being circulated between relevant Ministries (before endorsement and final adoption); however, forest pests are not yet listed. The species that have been identified to date are part of an expanding specimen collection.[44] However, equipment and staff numbers are not adequate for the work being undertaken – and this is a constraint when the department has to issue phytosanitary certificates (as the reliability of pest and disease identification is low).

20. Regarding SPS **diagnostic capacities,** laboratories related to the analysis of SPS risks are located within Camcontrol, MIME, MoH and MAFF.[45] ILCC is the only government laboratory that has ISO/IEC 17025 certification. Most Cambodian food processors do not have their own quality assurance facilities, and do not use laboratory services; a small minority relies on RGC (or foreign) laboratories for quality control. The various government laboratories are:

(i) **MAFF:** The NaVRI laboratory is in a new building, and equipment has been installed. NaVRI has the capability to test for H5N1 using real-time polymerase chain reaction (PCR) equipment, but the results still need crosschecking by *Institut Pasteur*. The laboratory is engaged in testing in the areas of parasitology, pathology, serology and hematology, bacteriology and virology, and can test for FMD, Brucellosis, and CSF (and soon will be able to test for rabies). Animal health and some animal product testing is still under one roof; however, there is very little capacity to analyze animal products on food safety (residues, contaminants etc.). A feed analysis laboratory is under construction, which - when operational - will be under the Veterinary Public Health Office.

(ii) **MAFF:** The Plant Protection and Phytosanitary Department (PPSPSD)[46] was supported by World Bank to establish a limited laboratory capability, particularly in pesticide residue analysis. The laboratory is now called the National Plant Health Laboratory, and is under the auspices of DPPSPS; it houses the national specimen collection. The laboratory infrastructure is currently being upgraded, and it is likely that this laboratory would become a part of the National Agricultural Laboratory (NAL) of Cambodia.

(iii) **MAFF:** JICA has assisted in creating capability to test quality and formulation of pesticides and fertilizers. Previously, if tests were needed, samples were sent to either Viet Nam or Thailand; FAO dispatched 100 samples to Viet Nam, for example. Veterinary drugs are occasionally tested at MoH's National Laboratory for Drug Quality Control (NLDQC).

(iv) **MoH:** Chemical[47] and biological analysis[48] of certain food products and beverages, is carried out at NLDQC (at a temporary site). More sophisticated tests are undertaken in Viet Nam.[49]

[43] This will be supported by the ASEAN-Australia Development Cooperation Program
[44] Those species that cannot be identified await the support from experts of donor-supported projects.
[45] Also the *Institut Pasteur* private sector (not for profit) laboratory deals with food safety issues.
[46] Formerly the Plant Protection and Phytosanitary Office (PPPIO)
[47] Testing for additives; Saccharin, Benzoic acid and sulfur dioxide
[48] MPN Coliforms, E.coli, Staphylococcus aureus, Clostridium perfrigens and Salmonella
[49] Particularly for products that are exported – e.g., on 3-MCPD presence in soy sauce

(v) **Camcontrol:** The department has a central laboratory that has some testing capacity in microbiology and chemistry for water and foods, and can test for compliance with cereal standards. Camcontrol has attempted to prosecute suppliers on 2 occasions,[50] but confidence in the laboratory analysis work is limited. Where equipment and media are available, the laboratory has taken part in inter-laboratory proficiency testing monitored by Quatest (Viet Nam). The major constraints in the Camcontrol laboratory appear to be a lack of operational budget, and the high staff turnover. This is mainly due to transfers to border inspection activities, and negates efforts to develop technically competent analysts.

(vi) **MIME:** ILCC operates microbiological and chemical testing laboratories serving the food industry, and has a metrology laboratory. The microbiology laboratory has ISO/IEC 17025 accreditation (for total plate counts, fecal coliforms, *Escherichia coli*, *Staphylococcus aureus*, yeasts and molds) and additional parameters accreditation is in process. Chemical testing is restricted to heavy metals in water.

21. Although some testing is conducted proficiently (e.g. HPAI, FMD, CSF) the accuracy of tests in these government laboratories can be considered questionable because: (i) limited proficiency testing is undertaken to calibrate certain tests; (ii) there is a lack of finance and availability of reagents and media to cover all the tests required; (iii) the volume of work is generally insufficient to maintain the proficiency of testing skills of staff; (iv) variable laboratory room temperatures occur; (v) glassware washing is poor; and, (vi) electricity voltage fluctuations are frequent. All these factors will affect the number of tests performed, as well as eventual result accuracy. At present Cambodia does not have the capacity to do conventional tests for: (i) pesticide residues and toxic metals in food and feed; (ii) veterinary drug residues in animal products; and, (iii) histamines.

4. Private Sector SPS Capacity

22. Sanitary and phytosanitary awareness varies considerably within the private sector in Cambodia. The companies that have the greatest awareness are: (i) those that export AFF products; and, (ii) the hotel and restaurant chains that are part of multinational corporations or are caterers for international tourists (these are relatively knowledgeable on food safety and will have Sanitation Operating Procedures in place). Similarly, agribusinesses that are part of multinational chains have increasingly begun to take responsibility for, and ownership of, their supply chains,[51] using outside technical expertise to improve SPS measures as necessary.[52]

23. Below the level of companies like these, SPS awareness is generally very poor, however. Many domestic processors and manufacturers cannot distinguish between quality and safety parameters, and no local SME processors yet have quality assurance programs in place. Few Cambodian enterprises are GMP compliant or certified. Although there is no in-country certification body for GAP, GMP and HACCP, any company that wishes to gain such certifications can contract with one of several readily available providers from Thailand or Viet Nam to undertake the work.

24. At present the agro-based production and processor sector consists of medium-to-small and micro-scale family-based enterprises; in 2008 MIME recorded 51,357 SMEs, with average sales revenue of $28,494 a year. Few companies are export-orientated, and production processes are of very limited complexity. It is estimated that the SPS-sensitive

[50] These cases related to the supply of soft drinks and noodles.
[51] For example, CP in pigs and chicken, and KFC in chicken
[52] CP utilizes Thai Veterinary specialists; KFC uses a Malaysian company to audit sanitation procedures

industries might incorporate some 1,500 enterprises – but the real number could be double this.[53]

25. Regarding RGC agencies working with the private sector to develop national SPS capacity: (i) MAFF is developing GAP for some crops, but as yet there is very little activity on the ground; (ii) support in sanitary and hygiene standards awareness is provided to primary production agro-enterprises, fish processors and slaughterhouses by departments within MAFF (Most advice is concerned with sanitary operating procedures and hygiene practices, and the departments provide mandatory sanitary certificates for products to be exported); (iii) ISC and ILCC have inspectors and other staff members that have been trained as auditors for Quality Management Systems (QMS) and HACCP, and will provide technical assistance in hazard avoidance compliance procedures and awareness seminars to the private agribusiness enterprises; and, (iv) FSB is undertaking a pilot project in food hygiene advice in restaurants in some tourist areas.

26. In terms of similar specific public donor support to the private sector, World Bank/IFC and USAID may also provide business development services or technical assistance support for SMEs in export standards compliance.

PART C: SUBSECTOR ANALYSES

1. Plant Health

27. As about 85 % of the population live in rural areas and make their livelihood in agriculture, RGC policy toward the plant health subsector, including the promotion of export crops such as rice, corn, cassava, cashews etc to regional and international markets, is therefore critical in achieving its objectives of poverty reduction - through improved agricultural productivity, food security, and employment generation. Of particular importance to SPS initiatives regarding plant health are policy goals under the *Agriculture Strategic Development Plan (2009-2013*)[54] that include improved market access (Goal 3) and improved institutional capacity and the legislative framework (Goal 4).[55] There are several main issues currently constraining the achievement of these policy goals.

28. Firstly are the problems surrounding the development of plant pest lists in Cambodia, and their implications for plant-based exports. The completion of specimen-based pest lists derived from IPSM-compliant crop surveys continues to elude the Plant Protection and SPS Department (PPSPSD) of GDA. Even after the conclusion of significant recent donor initiatives,[56] preparation of many crop pest lists is constrained by the absence of operational funding and continues in an *ad hoc* fashion without any clear indication of priorities or a timeline for completion.

29. Of importance is the pest list for rice; this is especially critical given the national policy on rice production and exports.[57] The main obstacle to promotion of rice exports has

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[53] For example 161 bottled water companies are listed by MIME but it is separately estimated that there are at least 312 such companies operating. (See '*GMS SPS Action Plan,* Appendix E).

[54] Developed and aligned with the National Strategic Development Plan (NSDP) Update 2009-2013.

[55] More specifically in relation to plant health, the previous Plant Protection and Phytosanitary Inspection Office (PPPIO), designated as Cambodia's National Plant Protection Organization, has recently been upgraded to the Plant Protection and SPS Department (PP-SPSD) under GDA.

[56] Such as the NZAID Phytosanitary Capacity Building Program for the Mekong Region, the AusAID SPS Capacity Building Program, the ASEAN-Australia Development Cooperation Program, and others

[57] *Policy Paper on the Promotion of Paddy Production and Rice Export*'. (July 2010). The paper describes a series of actions by RGC to help realize its ambition to achieve a 4 million ton paddy surplus and a 1 million ton rice export by 2015, from the current year's 20,000 ton paddy and 13,000 ton rice exported. Strategic and legal frameworks are being put in place to realize a bigger share of the anticipated 31 million ton global rice trade, at the same time enabling Cambodia to move away from the current informal export of unprocessed

been identified as export facilitation, including SPS compliance. The lack of comprehensive data on the pest status of rice already presents problems to the export of paddy and brown rice (i.e., partly milled rice) to China; other importing countries are increasingly expected to require similar requirements as provided for under the WTO/SPS Agreements. Access for Cambodia's paddy and brown rice to China's market was hampered for some time over questions of the presence of plant parasitic nematode propagules and weed seeds in brown rice.[58]

30. PPSPSD does not presently have adequate capacity to diagnose plant parasitic nematodes or weeds, and while the national SPS policy environment as a whole may be becoming more favorable in some ways (as was outlined in the generic sector analysis), it does not yet directly address the shortage of diagnostic expertise to handle the full range of potential pests and diseases that may occur on rice and other crops designated for the export market.[59] The current gaps in PPSPSD's ability to conduct and complete pest surveys to generate the required pest lists to support market access for the crops targeted for export thus represent a major constraint to sector and national policy goals.[60]

31. Likewise, vis-à-vis imports, improved surveillance and monitoring capacity for plant pests and diseases (together with improved gathering of plant health status data and its management) would also make significant contributions in helping shape science-based and informed decisions on the reduction of phytosanitary import risks (e.g., treatment requirements, post-entry quarantine, etc).

32. Secondly, are the issues surrounding pesticides management. This is a complicated area with which to engage, and it is presently characterized by cross-mandatory responsibility from various departments under MAFF.[61] Moreover, present legislation allows MAFF to take samples from the market, but does not provide mandates to any of the MAFF departments to carry out enforcement activities.[62] However, information obtained about violations can be used to inform enforcement authorities and the names of violators can be stored for follow-up controls.

33. At a technical level, the National Agricultural Laboratory (NAL) at GDA currently has responsibilities in the analysis of pesticides (and other agricultural chemicals such as fertilizers). In recent years, analytical instrumentation (i.e., GC and HPLC) has been acquired from external assistance programs (under World Bank and JICA, respectively – as was described earlier). However, due to the lack of operational funds, the laboratory does

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paddy grains. Rice trade in Asia alone is expected to reach 14.5 million tons; the strategy to move away from informal export of paddy to formal rice export is expected to sustain Cambodia's economic growth as the garment sector faces increasing stiff competition. The export of 3 million tons of rice will have an export value of US$2.1 billion (equal to 20% GDP) or equivalent to US$600 million in value-added contribution to the national economy.

58 The stalemate was averted only with the decision to halt export "brown rice" to China.

59 It is also notable that success in the implementation of the package of measures indicated in the rice policy is expected to catalyze the export of other agricultural products, partly as a result of increased institutional capacity to support market access and trade.

60 At the PPSPSD, there are currently 10 staff members assigned to carry out pest surveys and the follow-up diagnostic work to develop crop pest lists. Staff from other units or from the provinces may be deployed to assist in surveys. Besides rice, other priority crops identified are maize, cassava, cashew and fruits and vegetables. However, pest lists for these crops remain unavailable.

61 Three departments are involved, namely (1) the Department of Agriculture Legislation (DAL), in charge of pesticide registration, licensing and regulation, (2) the Plant Protection - SPS Department (PP-SPSD), has a role as technical adviser in field evaluation of pesticides (both chemical and biological), and (3) the National Agricultural Laboratory (NAL) of GDA is responsible for analysis of pesticides. This situation is further complicated by the fact that MAFF is mandated to be responsible for food safety issues from farm level to the final phase of primary processing (Article 1 of Sub-Decree 105, dated 22 August 2005 and Sub-Decree No.188 dated 14 November 2008). The Ministry of Commerce is responsible for food safety issues related to WTO-SPS and food safety at the border and in the market.

62 At present the enforcement mandate is with Camcontrol.

not conduct any analysis of pesticide residues, and analysis of pesticide products has been confined to those samples collected under activities of these aid programs only. Under the JICA project, the laboratory now has the capacity to test for some 24 pesticide active ingredients.[63] Results from this survey concluded that some samples had zero active ingredients. Some 136 pesticides are listed as permitted for use in Cambodia, with another 40 registered for restricted use. The long list (116 items) of banned pesticides acutely illustrates the need for improved vigilance in the management of pesticide quality in the local market. There is a need to conduct regular surveillance and for a monitoring program to test the quality of pesticides currently used by farmers, and provide the impetus to conduct formulation analysis of products submitted for registration on a regular basis.

34. Until clear mandates are established for the surveillance and monitoring of pesticide residues for NAL, a comprehensive monitoring program on the quality of pesticide products in the market would contribute to understanding of the extent and degree of pesticide product adulteration and contamination and the prevalence of illegal pesticides and formulations in the market as a basis for eventual remedy.

35. Thirdly, forest health is currently not mainstreamed into the SPS compliance process. Despite the volume of trade in forest and wood products between GMS countries, there has been little regional cooperation and sharing of information in relation to the phytosanitary risks associated with this trade. The *Agriculture Strategic Development Plan 2009-2013* includes proposed actions for the administration and sustainable development of the forestry subsector; the securing of a clearer picture of the forest health scenario in the context of increasing trade in these products is essential.

36. Fourthly, essential to modern science-based phytosanitary risk management and wider SPS management is the risk categorization of imported agricultural products. This can be achieved through a combination of a review of reciprocal plant health status information (i.e., of the importing and exporting countries) and analysis of inspection and interception records. The concurrent building of the capacities of inspection personnel at points of import through appropriate training, better support with inspection manuals offering standard operating procedures consistent with ISPM No.23 and 31, and guides to assist in the recognition of targeted pests could be an achievable target for Cambodia. Also, operationalization of a post-entry quarantine facility would further reinforce efforts towards improved import handling.

37. Lastly is the need to improve risk-based analysis. A recent FAO project[64] provided assistance to PPSPSD to set up a laboratory for pest risk analysis (PRA). With the availability of information management hardware (including a server, several PCs and internet connectivity), the process of consolidating local plant health status of crop commodities has been initiated. However, local staff: (i) do not have the technical capacity to make reliable judgments based on scientific data/information on the probability of pest introduction, establishment and spread, economic consequences and appropriate risk management options; (ii) do not have the necessary practical experience and confidence to conduct an actual PRA exercise; and, (iii) do not enjoy the benefit of a full complement of scientists to support any science-based assessment of overall risks. There is therefore a need for technical experts, drawn perhaps from both within and outside of GDA, to come together in 'practice by example' training sessions in PRA.[65]

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[63] Analysis has been carried out on approximately 80 samples of pesticide products collected from one province as part of the activities of the project

[64] TCP/CMB/3104(D)

[65] Skills required of any PRA team under the current global trading environment are not confined to the ability to conduct risk analysis on imports only, but should include the expertise and confidence to respond to technical market access requirements such as the appropriate delivery of technical information sought by the importing

38. In relation to these constraints in the plant health subsector, **the main investment opportunities** are therefore as follows: firstly, what is really needed is an improved annual pest surveillance program, systematically implemented and concluded and generating pest lists according to schedule. This should be accompanied by further development of a more comprehensive pest database and specimen collection, leading to a number of completed and published pest lists, more regular reports on the country's plant health situation to GMS, ASEAN, APPPC and IPPC, and active participation in regional working groups on plant health.

39. Central to any effective surveillance and monitoring program is support from diagnostic services. The ability to verify the taxonomic identity of pest specimens from surveys allows for the compilation of data with confidence in compiling a pest list, and accordingly requires investment in facilities, equipment, supplies and human capacity. Current staff capacity is in the identification of insect pests and plant pathogenic fungi; human capacity and supporting facilities are inadequate for the identification of weeds, plant parasitic nematodes, plant pathogenic bacteria and plant viruses. Support is needed in the form of resources for planned annual programs of pest surveys on the priority crops identified, with defined schedules for completion (and workshops to disseminate information and agree pest lists).

40. Capacity building support in diagnostics is also required.[66] Technical assistance to mentor staff and assist in the taxonomic identification of survey specimens would expedite the diagnostics component of pest surveys. Although funds could be provided for external identification when difficult specimens are encountered, this need would be reduced with the availability of a consultant diagnostician being available in-country timed to coincide with the completion of survey cycles.[67] Scholarships to regional universities and training attachments (particularly in bacteriology, plant virology, nematology, and weed science) are needed to complement the existing intellectual base; regional twinning arrangements with training/research institutions would be ideal.[68] To encourage the development of specimen-based pest lists, support is needed to upgrade the laboratory and equipment (i.e., with remote microscopy equipment, internet access to taxonomic experts etc), and for survey transport.

41. Construction of a greenhouse and supporting facilities to support the initiation of post-entry quarantine (PEQ) activities to strengthen import handling is desirable (to test if seed and other planting materials act as pathways for the introduction of unwanted pests and diseases). This would require training for diagnostic staff at the Plant Protection Centre (PPC). Any consultant-based resources could be the same as for pest list development. Improved management of data collected from field surveys and from identification of collected pest and disease specimens should be targeted, so that a more comprehensive database from the information generated can be utilized as useful resource for pest identification, trend analysis, risk management and policy decision-making. The systematic organization of collected data with appropriate linkages to the specimen collection is the desired result. PPC and other staff also need English language training to improve understanding of international rules, conventions, literature, etc.

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country, and assessment and response to specific conclusions and requirements in Pest Risk Assessments performed by importing countries.

[66] In the form of mentoring visits by regional experts coinciding with pest surveys, thereby facilitating diagnosis of specimens collected while providing on-the-job training of local staff at the same time.

[67] This would offer cost savings as well as the advantage of on-the-job training for more staff at PPC.

[68] Close cooperation with the Royal University of Agriculture (RUA) will also be needed to ensure cost-effectiveness and minimal duplication of effort in the development of these disciplines in the country.

42. The anticipated increase in Cambodia's export trade, especially with China and also neighboring Thailand and Viet Nam, suggests benefits from twinning arrangements with plant health institutions and laboratories in these more advanced GMS countries. Collaboration in such activities as pest surveys and diagnostics would foster practical benefits of mutual understanding and confidence in each other's plant health systems and thereby facilitate market access negotiations. Increased support for bilateral working group meetings that address specific SPS issues related to market cross-border trade and biosecurity is essential.

43. Secondly, regarding the problems of pesticides management, the main need here is to make improvements to the existing laboratory to enable an annual program of surveillance and monitoring of pesticide quality. The skills acquired by laboratory staff under the JICA Project (scheduled for conclusion by March 2011) could be put to good use through implementation of such a program.[69] Data on violations and violators need to be stored for use by enforcement agencies and follow-up inspections. Support for upgrades in small ancillary equipment, laboratory consumables (including standards, solvents and other chemicals, glassware, etc.) and operating costs would help to sustain sampling and laboratory activities.[70] Current staff members also work on soils and water analysis, and more practical experience in the analysis of pesticides is essential to build capacity, as is a strengthening of their backgrounds in chemistry. Support for participation in practical training available in the region would help upgrade skills and confidence, as would study visits to regional laboratories to learn about laboratory management, operational standards and proficiency testing. Again, improved English proficiency is desirable to improve the ability of staff in understanding of international rules, conventions, literature, techniques etc.

44. Thirdly, regarding wood products, the main objective is to get a clearer picture of the phytosanitary situation – i.e., forest pest circumstances and phytosanitary requirements of importing countries. A Cambodian study on the issue- to be eventually integrated with information from parallel studies in other GMS countries - is needed. A program of passive surveillance involving collaboration between the Agriculture and Forestry Departments to collect and collate available information to describe and understand the forest pest situation in the country is desirable, partly as a platform to raise the awareness of forest health personnel in the SPS Agreement and its requirements. Regional consultations to provide fora to identify common issues and weaknesses and to help identify opportunities for countries to work together to mainstream forest health into national SPS compliance processes are essential. With information from the national studies, the regional consultations should provide directions for better protection against the spread of forest pests, and allow improved phytosanitary handling.

45. Regarding import handling, training of phytosanitary inspectors to operate according to standard operating procedures is desirable, and should follow the development of a manual for import consignments inspection. Training would be consistent with RSPM No. 2 developed by the APPPC, and the manual consistent with ISPM No. 23 and 31. Translation into the Khmer language is required. Technical training for inspectors is also needed, to include pest detection, recognition of pest and disease symptoms, sampling and collection of specimens, documentation, etc; this could be supplemented by procurement or production of handy identification guides and small apparatus to support sampling and examination of produce.

46. Finally, in terms of strengthening risk analysis, the needs to overcome constraints are to build the practical skills of the PRA team. This requires the identification and assembly

[69] Provided that the situation with the mandate on market surveillance of pesticides is clarified.

[70] An annual program that analyzed 200 to 400 product samples would provide a good database on the extent of the pesticide adulteration, contamination and illegal import problem.

of a core multi-disciplinary PRA group drawing on technical plant protection subject matter expertise as the national PRA team. Under the guidance of international TA, the conduct of 'practice' risk analyses exercises based on major crop commodity imports could be undertaken. This training-by-doing activity would also serve as a risk-profiling exercise, leading to a second output, i.e. the categorization of risks associated with the entry of each of the major agricultural commodities imported into Cambodia.

47. Appropriate PRA learning tools to assist in the understanding of the basis and mechanics of the PRA process are also needed, as is a process to collect PRA documents from regionally and globally available sources into a reference database of PRA experiences with commonalities in crop commodity, pests and pathways. As in other suggested intervention areas, increased and enhanced English proficiency training to support staff in understanding of international rules, conventions, literature, PRA documents, etc is necessary.

2. Animal Health

48. RGC's first priority for the livestock sector is the promotion of production; a secondary priority is the promotion safety of animal products. Livestock production constitutes about 15% of agricultural GDP[71] (approximately 5% of Cambodia's GDP), and aggregate cattle, pig and poultry production has increased significantly in recent years. Cattle and buffalo are also important as draught animals in the production of crops, in particular rice. The total number of draught animals is about 1.6 million.[72] Cambodia does not currently undertake processing of livestock for export; however, there is a significant (and mostly informal) border trade in live cattle and pigs with both Thailand and Viet Nam. Department of Animal Health and Production (DAHP) figures show (for example) that in 2010 42,000 cattle were exported, and 307,000 pigs were imported. (The actual numbers of livestock traded are considerably higher than official figures suggest, however). Cambodia is also an important transit route for trade flows in livestock between its GMS neighbors - particularly for cattle from Thailand to Viet Nam (106,000 cattle transited in 2010, again according to official figures). Increased production will replace imports, will result in more formal and informal exports, and will contribute to a strengthened stock of draught animals for boosting crop production (especially rice),

49. Animal diseases (i.e., FMD, CSF, HS, etc) are endemic in Cambodia, and they have a major impact on animal production (through increased morbidity and/or mortality). FMD and HS outbreaks can also significantly affect the use of draft animals, and hence, negatively, crop production (again, especially rice). In 2010, outbreaks of HPAI (2) FMD (82), HS (52) and PRRS (5) were recorded in multiple provinces; these occurred more commonly in border areas with high levels of animal movement. There are clearly implications for trade in livestock and livestock products from the existence of TADs. An issue of particular importance is that Cambodia's land borders are relatively porous to animal traffic and the threat of TAD associated with illegal importations is consequently high.[73]

50. As a means of improving animal production, the use of animals for draught and crop production, and for limiting the risks associated with trade in livestock, improvement in the management of TAD is now considered a high priority by RGC. There is general agreement that the most effective approach to gradually reducing the burden of TAD - and ultimately eradicating diseases - is through rapid response to outbreaks by measures like vaccination,

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[71] Department of Animal Health and Production, Summary Report (2010)

[72] There are 3.5 million head of cattle, of which some 1.2 million are used for draught, and out of 0.7 million buffalo 0.4 million are used for draught. – DAHP figures (2010)

[73] Outbreaks of PRRS have been associated with the illegal importation of pigs from Viet Nam.

culling, animal movement control and quarantine. This requires early detection of outbreaks through active and passive surveillance. The responsibility for TAD surveillance and control, and for the management of animal/animal product imports, resides with DAHP. Although current legislation to support TAD control is relatively weak, DAHP does have good technical capacity (via the Office of Animal Health (OAH) and National Veterinary Research Institute - NaVRI) to implement surveillance and control activities. DAHP has well-established networks for disease reporting that link the provinces to central DAHP. However reporting of the animal disease situation is not consistent across all provinces, and there is no central system for data collection and management (with the exception of a database developed for specific HPAI activities). Due largely to a lack of operational funding, active surveillance and control activities are very limited at present - with the exception of HPAI (which has received significant donor support over the past 10 years) and vaccination activities (implemented for HS by OAH - in 2010, 1,799,000 doses were provided for HS by RGC for farmers via Provincial Animal Health Offices, for example).

51. In order to improve TAD control in Cambodia, assistance is required to: (i) support DAHP operations (through focused active surveillance for priority diseases such as FMD, HS, CSF and PRRS); (ii) strengthen the disease reporting systems; and, (iii) improve response capacities. Well-structured support for surveillance and response focused on a limited number of provinces could enable better control of TAD in particular target areas, could improve information availability on disease status (through increased testing) and so enable improved planning; and could strengthen the functionality of animal health networks. This would improve DAHP's ability to extend better TAD control measures to other provinces in the future. Overall, the potential to design and implement investment for TAD control is high.

52. Veterinary drugs and medicines are important inputs into livestock production systems - in terms of maintaining animal health and improving production. Currently a number of companies produce veterinary medicines and drugs, and there are also significant imports of these products from Thailand and from Viet Nam.[74] There are concerns in Cambodia regarding poor quality and/or counterfeit products being prevalent in the market place. Inadequate safety controls: (i) can affect production, because of ineffective or dangerous medicines for animals; (ii) place final consumers at risk of animal products containing residues; and, (iii) increase the likelihood of anti-parasitic and antimicrobial drug resistance.

53. A similar situation exists in regard to animal feed – i.e., with part of the feeds being produced in the country and also with significant imports coming from Thailand and Viet Nam.[75] Feed represents a significant input for animal production systems, and is also an important risk pathway for animal health and disease issues and for contamination of feed with compounds that may represent food safety risks to consumers. As pig and poultry production both increase in Cambodia, the importance of effective regulatory control of veterinary drugs and feed will also increase concomitantly.

54. The 1996 Law on Management of Pharmaceuticals provides mandates for control, and there is an agreement between MOH and MAFF on registration of veterinary drugs. Within MAFF, the responsibility for the approval of veterinary drugs and animal feed is shared by the Department of Agricultural Legislation (DAL) and DAHP[76] and there is a

[74] MAFF statistics show licensed imports in 2010 of 15 tons of drugs and medicines - including antibiotics, vitamins, vaccines and anti-parasitic drugs from Korea, Indonesia, UK and Belgium. Significant amounts of veterinary drugs and growth enhancing imports are probably smuggled in.

[75] MAFF figures show that the majority of local feed production (in 2009 this was 165,000 tons) is produced by four major commercial firms, with additional imports (in 2009 this was 60,000 tons) coming from Thailand and Viet Nam. In addition there is supply from smuggling.

[76] Under MAFF Ministerial Sub-decree 16

shared process of registration and licensing for production and imports. Beyond this, there is hardly any legislation defining the roles or safety standards for veterinary drugs or animal feed needed for testing, monitoring and inspection activities. Moreover, virtually no food safety and feed standards have been adopted under the 2007 Standards Law.[77]

55. There is no laboratory capacity within DAL or DAHP to support approval testing of products or of subsequent monitoring activities. Although the lack of laboratory testing capacities for safety of drugs, feed and primary food products forms a constraint for ensuring adequate safety controls, it is not absolute. The lack of funding for operational costs constrains the use of present capacities: there is some testing capacity of zoonosis in feed and food at NAVRI, some capacity for testing composition (i.e. quality) of veterinary drugs at the MOH laboratory[78], rapid test kits for antibiotics are readily available in the market (and used in other countries and by Camcontrol), and neighboring Viet Nam and Thailand have excellent capacities for conventional testing (e.g. HPLC, LC/MS, LC/MS/MS) of a wide range of safety parameters (including residues of antibiotics). Lastly, several laboratories – ILCC, Camcontrol, *Institut Pasteur* – have capacity for testing food safety parameters that could be utilized for testing similar parameters in animal food and feeds.[79] However, there is no coordinated program in Cambodia to make use of existing capacities for regulatory testing and to further develop laboratory capacities for food testing.[80] More important for safety control – and necessarily preceding the establishment of conventional testing capacities – are a proper legal and regulatory framework (including relevant standards), a risk-based surveillance and inspection system, a database, and the capacity to make use of the findings. None of these features are yet extant, and there are no capable staff or operational funding for undertaking such tasks. MAFF is presently establishing an Animal Production Research Institute (within DAHP) that is intended to house and implement all regulatory functions for the control of animal products, veterinary drugs and feed.[81]

56. The Law on Animal Health and Production that is currently being prepared,[82] has provisions for control of veterinary drugs, food and feed. However, its promulgation and implementation through adequate regulations and guidelines will most likely take several years, mainly because of the overlapping mandates of ministries.[83] Since Cambodia has hardly any standards on safety of feed and food, a process of standards setting under the Standards Law is needed, which requires cooperation of the other ministries involved.[84] Regulatory control measures need to be established for a transparent risk-based system of surveillance and inspection,[85] for which regulations need to be developed. Also, a database

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77 Existing mandates/responsibilities will be updated with the new Law on Animal Health and Production.

78 Making good use of these capacities would require modest investment in standards and training, and operational funding of about $100 per sample.

79 There are also several laboratories with some capacities for testing quality of feed including the Pasteur Institute, CelAgrid, and Royal University of Agriculture – which is not SPS. Private feed production firms in Cambodia such as CP Cambodia and Agri-Master have their own testing capacity.

80 The *SPS Action Plan for Cambodia*, prepared by FAO with funding from the Standards and Trade Development Facility recommends consolidation of food testing laboratory capacities.

81 A building is currently being completed; however, it is not clear when this institute may become functional, nor what level of human and financial resources it will eventually be allocated.

82 With support received from FAO and USAID.

83 The broad scope of the law and complexities related to it requires discussion with other ministries and stakeholders which may affect the length of time for decision-making. One area of concern is that the new law may increase the cost of doing business for small and medium enterprises through expanded use of licenses, permits and inspections.

84 Although the Interministerial Prakas No. UATH.BRK 868 on the Implementation and Institutional Arrangements of Food Safety Based on the Farm to Table Approach does not directly refer to mandates for veterinary drugs (other than making reference to the Law on pharmaceuticals) and related safety of food and feed, the principles applied in the *Prakas* most likely imply that different Ministries share some responsibilities for market access, production, marketing, use, standard setting, inspection and surveillance for feed and veterinary drugs.

85 There is often an inclination to use regulatory powers of inspectorates and mandatory testing with fees as a para-fiscal instrument to fund operational cost of inspectorates and laboratories. However, good practice and

is needed to ensure effective use of testing data for subsequent risk analysis and policy response.

57. Testing for veterinary drug residues can involve many parameters and high levels of precision for measuring maximum residue levels (MRL) are required. In order to meet the broad range of requirements in demanding export markets, investment in sophisticated equipment would require around $0.75 million, and an annual operating cost of up to $100,000. Since Cambodia is not exporting poultry, pork and feed and has virtually no information on veterinary drugs residues, it should first of all give priority to obtaining information about the incidence of use of forbidden antibiotics and growth enhancers, and high levels of residues of commonly used antibiotics. For this purpose, a robust domestic capacity could be based on a combination of conventional testing with HPLC technology and use of rapid test kits. (Rapid test kits are widely used internationally because they are quicker and much cheaper for detection of residues than conventional methods). Conventional methods can be used for verification - if needed - for measuring levels of residues. In future, such capacity can be expanded to include more veterinary drug parameters and higher precision by acquiring more sophisticated expensive equipment, such as ICP and GC-MS-MS.

58. Food safety of animal products through to primary processing is the responsibility of DAHP, via its Veterinary Public Health (VPH) Unit. In terms of existing capacity, the VPH Unit has a total of 15 staff - with 3 dedicated to oversight of meat inspection and 6 to zoonoses. It has no laboratory facilities to support monitoring of hygiene or zoonoses; in effect, no significant testing is conducted. Inspection of slaughterhouses is the responsibility of provincial Animal Production Office staff. Some improvements have been made in recent years regarding the control of slaughterhouses; 78 slaughterhouses are registered nationally. An inspection manual exists for meat inspection standards; however, training of provincial staff has been very limited. Provincial staff reports meat inspection activities to the VPH office.[86] Inspection and monitoring visits to provincial areas by VPH are limited, mainly due to a lack of operational budget. There is no linkage between meat inspection and disease reporting, and no central information management system is in place for management of inspection records.

59. DAHP considers monitoring of the importation of animal products to be the responsibility of the OAH; however, the responsibilities of the various agencies (Camcontrol, Customs, DAHP) regarding inspection of animal products at the border are not currently clear. In fact Camcontrol is inspecting safety of animal product at the borders and in domestic markets, and it appears that (in practice) DAHP takes no part in food safety management at these locations.

60. Basic national animal health inspections (in terms of the approval of slaughterhouses and regarding the conduct of *ante mortem* and *post mortem* inspections) are covered by a Ministerial Sub-decree.[87] However, there are no specific legislated standards on animal diseases, hygiene and processing standards, nor the definition of inspection structures.

61. Border controls are the responsibility of the OAH and the Epidemiology Unit; NaVRI is also involved in providing technical support on decisions regarding imports. Some legislation is in place[88] allowing for inspections and controls of animals and animal products at border points. However, the legislation does not include detailed standards. Permits for

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compliance with SPS principles is to focus inspections on risks and violators and to avoid regulatory burden for compliant products and enterprises.

86 MAFF records (2010) show the slaughter of only some 100,000 cattle/buffalo and 600,000 pigs

87 Number 108

88 Ministerial Sub-decree 16

entry or transit of animals and animal products are issued centrally by the OAH. There are 22 international border points, and two international airports. OAH has 16 staff in the provinces to work alongside Provincial Animal Health Office staff to conduct inspections. There are no inspection manuals in place, and animal health certification standards for imports are not set by Cambodia but are (in effect) based on the health certification produced by the exporting countries. It is not clear what standards are followed for inspections - beyond the checking of permits, export certification and vaccination records for animals. There are no quarantine facilities at borders, and (apart from some cleaning and disinfection operations) no equipment or inspection facilities. Operational budgets for implementing border control activities are minimal. There appears to be conflict over responsibilities for border control functions between the different inspection agencies; a sub-decree is being drafted by MAFF to clarify responsibilities in regard to SPS related actions, but it is not clear when agreement will be reached.

62. In terms of regional cooperation on animal health, Cambodia participates in the ASEAN Livestock Technical Working Group, and has bilateral agreements involving TAD control and border handling with Thailand and Viet Nam. Attempts have been made to establish a similar agreement with Lao PDR, but this is yet to occur. Improving cooperation and coordination between GMS neighbors is an essential part of seeking sustainable improvement in common SPS issues and promoting harmonization of standards.

63. In the current Cambodian SPS circumstances and the kinds of constraints just described, the main **investment opportunities** for animal health are as follows: (i) improving DAHP ability to survey, test and respond for four selected priority diseases (FMD, CSF, HS and PRRS); (ii) providing some support for formulation testing of veterinary drugs and animal feed – although this is necessarily constrained by existing legislative conditions; and, (iii) improving border handling.[89] Of these, support for veterinary drugs and feed is less of a priority at present in terms of the ability for investment to improve production and trade. For TAD and border handling, given the scale of needed interventions and likely resource levels available for investment, it will be essential to target priority areas of the country for any field-based activities; in this regard, target provinces might be Kampong Cham, Takeo and Svay Rieng (because of their border location, high movement of animals, and numbers of TAD outbreaks).

64. Firstly, as regards surveying, testing and response for TAD, the first need is to upgrade NaVRI laboratory equipment, to supply testing consumables, and to provide refresher or proficiency testing for target diseases. Technical assistance is needed to assist in developing initial surveillance program activities, and - to strengthen the technical capacity of the Epidemiology Unit - it is essential that a NaVRI staff member be sent for postgraduate training in epidemiology. Vehicles and funding support are needed to enable regular surveillance visits to be conducted by DAHP and provincial staff. Awareness activities on disease identification and control measures are needed with farmers and traders, and awareness materials should be developed. Support for outbreak response activities is required, and links need to be strengthened with SEACFMD (to support supply of FMD vaccine as required for outbreak response and strategic vaccination). Technical assistance to develop a database for recording testing and surveillance activities and provide training on database use and ongoing support is necessary, as is the provision of IT equipment to enable data entry and protection. Support is needed to enable regular visits by DAHP staff to targeted areas to strengthen reporting networks and support provincial staff in their

[89] Unlike in other CL countries, opportunities to provide support for improving food safety in animal products are limited by the current lack of legislated standards and lack of existing inspection and monitoring structures. Significant improvement is required in the regulatory framework before investment could become effective. It is also worth noting that support can be provided for veterinary residue testing of animal products in Camontrol (utilizing rapid test kits).

reporting. Resources are also needed to facilitate DAHP's participation in bilateral and regional GMS meetings on TAD. Bilateral exchange visits under the memorandums established with Viet Nam and Thailand should be supported to promote TAD disease management cooperation.

65. Secondly, there is a need for establishing SPS-compliant control capacity for animal products, feed safety and veterinary drugs. However, within RGC priorities, the GMS context and current budget constraints, there is no room for large-scale support. Moreover, there is no readiness for investment, because of the prerequisite legal and regulatory frameworks and consent from other ministries. Given these current institutional complexities, it will most likely require three years at least before there is readiness for investment for the development of testing capacity of antibiotics residues and banned substances in pork, poultry and feed. Therefore, only limited investment support can reasonably be envisaged for setting up basic capacity in the area of veterinary medicines from the year 2014 onwards, and this would be contingent on sufficient progress has being made with: (i) the implementation of a proper legal and regulatory framework for inspection mandates and methods, and standards on residue limits; (ii) assignment of staff for the laboratory; and, (iii) establishment of a suitably furnished laboratory space. Possible appropriate support – given such conditions being met - would include: (i) HPLC with standards for antibiotics[90], documentation, proficiency testing, small equipment, consumables, chemicals needed for its operation during two years; (ii) provision of rapid test kits for screening residues of biotics and antibiotics;[91] (iii) in-country training for using the equipment and sample collection; and, (iv) training for the design of an annual cycle of risk-based surveillance, inspection, data storing and analysis.

66. Thirdly, in terms of border handling, although legislation in this area is also weak and requires improvement, there are staffing capacities and inspection structures in place. To improve border control, support is required to establish a list of risk products and to develop import certification standards for them. An inspection manual can then be developed for border staff and training conducted on expected standards. This support would be best focused in key provinces with high levels of imports and transit activity. Technical assistance is needed to define a list of high- risk products, establish a set of import conditions and develop a technical manual of inspection standards for border staff. Training for DAHP staff in risk assessment methods and development of standards (ideally through a 'learn-by-doing' approach) is required, as is training on updated technical standards for AHO and provincial border staff. Support is also desirable to enable regular surveillance visits to be conducted by DAHP staff to visit border points to monitor border activities. The expected outputs of improved border handling would be better control of risks associated with animal and animal product imports; this would also contribute to improved TAD control.

67. To improve the level of understanding of border control standards and procedures and emerging risks, and to facilitate harmonization of standards within GMS, support is also desirable for bilateral working group exchange visits. Cambodia has existing bilateral agreements with Viet Nam and Thailand under which collaborative activities could strengthen TAD control through improved border and quarantine arrangements including establishment of pre-export and transit quarantine facilities (this would be best achieved utilizing private sector involvement). Establishment of a similar agreement with Lao PDR would be desirable and could justify investment support.

3. Food Safety

[90] Oxytetracyclines, aminogycosides (eg gentamicin, kanamycin, neomycin, streptomycin), beta-lactams (e.g., ampicillin), chloramphenicol, beta-agonists (e.g., clenbuterol) and fluroquinolones (eg enrofloxacin). Antiparasitics such as avermectin and fenbendazole

[91] Beta agonist, chloramphenicol

68. Despite its importance as a major public good, the conditions surrounding food safety control and the promotion of good practices in food safety management are presently very poor in Cambodia, and they are much weaker than in most other GMS countries. The most basic constituents of a food safety system are: (i) the collection of information on the safety of food and incidence of food borne diseases - through active and passive surveillance and inspection; (ii) response to health hazards; and, (iii) preventive measures - such as adoption of GHP, GMP and HACCP - and the control of agricultural inputs such as pesticides, veterinary drugs and growth enhancers. These constituents are largely absent at present, and Cambodia's food safety performance is the weakest within the GMS.

69. As a first major constraint, there is little basic information at the national level (and even less at Province and District levels) about the safety of food, about the safety of handling food by establishments serving the public, and about food poisoning outbreaks. This is despite the numerous control activities in the domain of respective agencies in the forms of registrations, permits, licenses, and inspections; these are not very effective from a health perspective, and they are costly for businesses (because of fees, business time lost, and the informal payments that must be made). Such control mechanisms are not based on good regulations and clear standards, and are not risk-based and science-based. Overall: (i) there are few comprehensive regulations governing public or private sector behavior in food safety; (ii) hardly any programs and budgets for the design and implementation of public services to address food safety concerns; and, (iii) extensive deficiencies in human resources in both public and private sectors for food safety management.

70. Responsibility for food safety in Cambodia is shared by several agencies. As was broadly outlined in the sector overview, within MAFF, it is GDA, and DAHP[92] which are the main agencies responsible for the safety of primary and semi-processed agricultural products. In MOH, the main responsibilities are with the DDF and the CDC; these include food safety in restaurants, street food, GHP and response to outbreaks of food-borne diseases. In MOC, the General Department of Camcontrol is tasked with control of the safety of imported food and food in markets. Camcontrol also houses the country's Codex contact point. The Ministry of Industry Mining and Energy (MIME)[93]is responsible for food safety in food processing industries, food safety standards for processed products, and GMP and HACCP. Legal mandates among and within the Ministries and agencies are in many cases not very clear, and their formal powers are frequently insufficient; there are several areas of regulatory overlap, and also areas with major gaps.

71. In terms of food safety tasks actually undertaken by different institutions at present in Cambodia (in contrast to any formal regulatory arrangements), the situation is as follows. Firstly, Camcontrol has a permanent presence on the borders[94] and conducts controls on safety at border posts. It also controls food in markets. It does not have an annual risk-based surveillance and inspection program and maintains no database on detected food safety violations. Food safety standards applied are not clear in many cases.[95] As was also described earlier, Camcontrol has a laboratory to support its inspections; this has a significant amount of equipment, such as high performance liquid chromatography (HPLC), atomic absorption spectrophotometer (AAS), spectrophotometer etc., which is presently underused[96] because of a lack of recurrent funding and difficulties in retaining trained staff.

[92] The Fisheries Administration (FiA) has also major responsibilities.
[93] The capacities in MIME are not discussed here since MIME receives support from other projects (ADB PED, World Bank TDSF, and UNIDO).
[94] Cambodia and China are the only GMS countries with permanent food control agencies on the borders. Controls of imported food on the borders of other GMS countries are selective and incidental.
[95] The number of standards approved adapted under the country's 2007 Standards Law is very limited.
[96] In 2010 Camcontrol's laboratory analysed 1474 samples for chemistry and 309 samples fort food microbiology. 373 rapid test kits were used on border posts, showing 29 violations.

Most staff in Camcontrol apparently prefer to work in inspection activities rather than in the laboratory. The lack of funds, and laboratory staff with expertise in food and feed analysis constrains upgrading of testing abilities to cover more difficult food safety testing parameters (such as multi-pesticide residue analysis, veterinary drug residue analysis and other food contaminants). In addition, the cost of reference standards, chemical reagents, glassware and spare parts of these instruments are very high, because they need to use high purity grades. In order to make good use of the equipment it already has, the Camcontrol laboratory would likely need a recurrent budget of at least $100,000 per year. Moreover, the location of the laboratory and its physical structural features impose constraints on the quality of its performance.

72. Secondly, MAFF has virtually no food safety sampling and testing activities for plant and animal products, no operational budget and no suitable regulatory framework upon which to base food safety control measures.[97] It has no laboratory testing capacity for food safety, and although use of rapid test kits could be a cost-effective alternative to part of the more costly conventional testing, it has no plans to use these.[98] There are some meat inspections in registered slaughterhouses, but - to date - there are no food sampling and testing programs, and there is virtually no use of existing capacities in laboratories under the other Ministries. MAFF aims to adopt ASEAN or Codex standards,[99] but the necessary legal requirement of the adoption of these standards under the Standards Law has not yet been met.[100]

73. Thirdly, MOH (in principle) requires the meeting of basic hygiene conditions in restaurants, but implementation and enforcement is very limited. It typically has 2 inspectors in most provinces of the country, and a few more in each of the major tourist areas. Again - in principle - the Ministry of Tourism (MOT) registers restaurants for the tourist industry and requires compliance with MOH hygiene requirements, but the registration rate is believed to be only about 30%[101] - and many of these establishments don't comply with hygiene requirements in any case.[102] MOH has a hygiene promotion program in restaurants, with a logo that (reportedly) covers 10 restaurants in Siem Riep, 200 in Phnom Penh and 9 in Sihanoukville.[103] MOH has adopted a *Prakas*[104] to introduce a rating system for food safety in restaurants, but a scorecard to apply and implementation plan to establish this are still to be developed.

74. MOH conducts a limited amount of controls on street food and restaurants, but it lacks resources for running a program on any scale. CDC registers outbreak reports on food

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97 A draft law under preparation with support from FAO for "*Veterinary and Animal Production "* aims to improve parts of the legal framework, but before it has been put to the public for comment there is already discussion about its merits because of concerns about increased cost of doing business it might generate for the private sector. It usually takes a few years to enact new laws in Cambodia, and the controversy is likely to extend the time needed for the introduction of an improved regulatory framework.

98 As in many other agencies in Cambodia, laboratory staff tend to see the use of rapid test kits as technically inferior and associated with lower status work.

99 Decision 334 PRK.MAFF, August 7, 2007, article 17. In fact no country in the world has adopted all Codex standards, because many of them have low relevance, and enforcement is costly

100 In 2005 the EU *Multilateral Trade Assistance Project for Laos and Cambodia* provided TA support for the adoption of international standards through a report and in 2007 a task force was created to study the options, however, there has been virtually no follow-up in decision making.

101 The low registration rate probably reflects the perceived imbalance of registration costs and benefits.

102 MOT has its own grading of restaurants, which is based on registration and so called "cleanness". It grades all restaurants with good food safety handling and registration as **A**; those with either registration or good food safety handling as **B;** and those with neither registration nor good food safety handling as **C.** There is no involvement of MOH with the "cleanness" rating.

103 There were initially 21 restaurants with such (annual) certification, of which 9 were re-approved and 12 are still pending for re-approval.

104 *Prakas* No. 099Ror Bor Sar/Or.Bor.Sar, February 24, 2011. *'Provision of Good Hygiene Practice Signboards for Restaurants and Canteens'.*

poisoning and sends reports to DDF. However, the number of reports is limited, and in only 14 cases (in 2009) and 13 cases (in 2010), which were considered serious, did outbreak investigations take place. Findings from these investigations are often not clear, because the response capacity is limited, and important evidence is no longer available when the investigations actually take place.

75. MOH has a laboratory for testing drugs and food; it charges fees and retains most of the revenue for covering its operational costs. Capacity is largely sufficient for simple tests on microbial safety of food, hygiene in restaurants and for detecting chemical adulterations in street food, but there is no regular surveillance, and only in special cases are samples sent for testing (There is a formal quota of 40 per year).[105]

76. In October 2010 an inter-ministerial *prakas*[106] was adopted, with its aims being to: (i) improve the implementation of food safety system for the protection of consumer health and to enhance Cambodian food export competitiveness; and, (ii) set up institutional mechanisms for facilitating and coordinating activities from different ministries and competent authorities related to food safety. The *prakas* stipulates that the Inter-Ministerial Committee for Coordinating Inspection of Quality and Safety of Products and Services[107] has the responsibility to coordinate the work and activities concerned with food safety management of the Ministries and competent authorities.

77. This *prakas* is a welcome step in the right direction, but there is a long way to go before a credible food safety system is established. Regarding the *prakas*: (i) it does not change existing laws, decrees and sub-decrees that govern the powers of the Ministries; (ii) the established positions of the Ministries have still not changed; and, (iii) respective interpretations of the contents and implications of the *prakas* also appear to differ between institutions at present. Most importantly, Cambodia still has no effective body for coordination of SPS that can effectively help to solve conflicting mandates between the Ministries. In short, there is a strong need for an effective independent coordination body that meets regularly.

78. The consequence of the current situation with food safety is that the time lost to illness and disease in Cambodia is significant.[108]Detailed information on exactly what causes this situation is largely absent, but there can be little doubt that food hazards contribute to national diarrheal diseases incidence and to overall morbidity (and in some cases to mortality). Consumers' health and wellbeing is clearly affected by adulterated, spoiled, contaminated, and sub-standard food products. Substantial economic and financial costs are

[105] Actual sample collection and testing in the MOH Laboratory 2007-2009

Type of Products for testing	**Type sample of collection**	
	Microbiology	Chemistry
Water convolvulus	50	0
Boiled meat	15	15
Instant Noodle	15	15
Chinese Noodle (Houtiey: Local made product)	15	15
Other products*	15	15
Total per 3 years	**110**	**60**
Average sample per year	**56.6**	

* The majority are vegetable products.

[106] *Prakas* No. UATH.BRK 868. ADB has initiated work and supported the drafting of this *Prakas*.

[107] Established by Sub-Decree 05 ANK.BK, February 3, 1998, but has never become active.

[108] Measured in DALYs the country is losing annually 2,843 years of healthy life because of diarrheal diseases, compared to 1,442 for Lao PDR, 449 for Thailand, 315 for Viet Nam and 28 for Japan. http://www.who.int/healthinfo/global_burden_disease/gbddeathdalycountryestimates2004.xls The Disability-Adjusted Life Year (DALY) rate indicates the number of healthy life years lost per 100,000 days because of mortality and morbidity caused by various diseases and other debilitating factors. [See http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/]

incurred, as individuals lose work time and income because of illness, and they have to pay for medical treatment.

79. There is a particular and increasingly significant issue with food safety in the tourist industry. Cambodia has a rapidly growing tourist sector; since 2007 visitor numbers have exceeded 2 million a year.[109] There are now about 1,500 registered hotels and guesthouses with some 30,000 rooms in the country,[110] and by 2007 hotels and restaurants already accounted for about 4% of GDP.[111] Many more guesthouses and restaurants are informal in operation – the proportion of low-budget, independent travelers in the country is increasingly large. However, unlike neighboring Thailand and China, there are no official guidelines for, and no inspection capacity for, food handling in restaurants and hotels in the tourist industry. This absence constitutes an important reputational and economic risk for both Cambodia and the wider GMS – particularly in the event of major disease outbreaks occurring, but also in the broader sense of regional tourism product marketing and consumer perceptions.

80. Food poisoning incidents in tourism establishments are underreported, and public investigations into particular food safety events are very limited in number. More positively, it is generally agreed that incentives for promoting safe food handling within Cambodia are strongest for those enterprises operating in clusters of hotels, restaurants and food suppliers/processors (e.g., around Siem Reap and in Phnom Penh) that depend on tourism. However, at present MOH lacks the human resource and budgetary capacity for an adequate response (in the absence of specific training of staff for doing audits on GHP and GMP-based scorecards) and for providing advice to enterprises on upgrading facilities and handling. Public and donor support for promoting food safety in hotels, restaurants and the domestic food processors has so far been very limited.

81. In terms of donor support for food safety, FAO and WHO have put together very broad guidelines for hotels and restaurants, markets, and street food handlers. However, implementation has been slow because of a lack of human resource skills and a lack of basic information. There is no systematic gathering and evaluation of data on food safety hazards that can be used for formulating policies, for awareness raising, and to develop food safety inspection programs.

82. A risk-based approach for food safety inspection (in line with WTO principles and Codex recommendations) is lacking in Cambodia. Support has been received from: (i) FAO/NZAID, UNIDO and ADB PED for improving Camcontrol laboratory capacities; (ii) from UNIDO, ADB PED and FAO for strengthening the ILCC laboratories; and, (iii) from UNIDO, World Bank TDSF and ADB for standardization at MIME; and (iv) ADB has provided support for improving alignment in food safety legislation and generic expertise in risk evaluation. However, very little support has been received for food safety practice implementation and systematic gathering of data needed for implementation of risk-based food controls.

83. Given these kinds of food safety subsector circumstances, the broad **investment opportunities** are to: (i) help with the design, establishment, and implementation of national food safety surveillance and inspection programs; and, (ii) to promote improved food safety handling in the tourist industry specifically. In addition, work to handle first time market access requests and to establish risk-based import handling of food products is justified.

84. Firstly, support is needed for the design and implementation of annual programs of food safety surveillance, monitoring, inspection, and response to hazards. Programs should be based on known and perceived risks about food safety hazards in particular products,

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[109] In 2009 visitor arrivals were 2.162 million; Tourism Statistics, Annual Report, MOT (2009).
[110] This may be about a third of all such establishments.
[111] IMF *Country Report* (09/48) – Statistical Appendix (2009)

product origins, locations, markets, major public events, hotels and restaurants (especially in the tourist sector), and enterprises. The focus should be on both imported and domestic products.[112] The composition of annual programs would change with better understanding of existing risks and emergence of new risks. Support could be provided for food testing and for selective upgrading of testing facilities. For reasons of cost-effectiveness, and where possible, priority should be given to the use of rapid test kits. Initially the focus will be on a limited number of priority food safety parameters, and - once the system is operational - additional parameters can be added as needed. Standards need to be adopted for making meaningful use of conventional testing methods and for enforcement purposes. Although the aim would be to eventually cover the whole country, the system would be established first in Phnom Penh - for reasons of logistics and the facilities presently available, and in subsequent cycles the system may be extended to Siem Reap and Sihanoukville. The findings of the tests would be stored in a database system to be used for risk analysis, management support, guiding response to food safety hazards, an annual report to the public, and reporting to other agencies involved such as MAFF and MIME where relevant for their response.

85. Such an investment component would support cooperation and the exchange of information with neighboring countries through bilateral working groups with Viet Nam and Thailand, and through participation in: (i) WHO's INFOSAN; and, (ii) the ASEAN rapid alert system for food and feed (ARASFF).[113] Support is desirable to produce material for awareness raising and education, and for improving the capacity for rapid intervention in case of outbreaks. Where needed, support would be given for upgrading technical regulations. Support would be desirable to provide for training workshops for MOH and provincial staff to be able to respond more effectively to reported food poisoning outbreaks with outbreak investigations.

86. In addition to efforts to control imported food products through improved food safety surveillance and inspection, support is desirable for developing and implementing improved and risk-based methods of controlling imported processed food for Cambodia (in line with international and ASEAN recommendations). This would include: (i) preparing risk-profiles for different products (categorized as 'high', 'medium', 'low') for which different rates of inspection can be implemented; and, (ii) the design of improved inspection manuals (where possible harmonized with neighboring countries) and their implementation.

87. Secondly, improved food safety handling in restaurants in the tourist industry could be pursued through enterprise grading- using score cards on the basis of GHP and GMP parameters. Through study visits, information and experiences on the development and application of scorecard-based systems could be collected from China, Singapore and Thailand - where scorecards are routinely used for diagnosing food safety handling procedures. Support could be given for: (i) developing a system of upgrading safe food handling by scorecards and grading systems; (ii) awareness-raising in the tourist industry; (iii) conducting training courses for private sector and government staff and inspectors; (iv) providing diagnostic assessments (i.e., pre-audits) of restaurants and hotels and (based on results of those pre-audits) advice given (by private consultants) to enterprises for their food safety handling upgrading; and, (iv) auditing enterprises against the scorecards and assigning grades.

88. After such a grading system had been established, subsequent grading services could thereafter be provided by private companies (acting as service providers for the public sector). Investments to support the drafting of suitable regulations for implementation of the

[112] The surveillance of imported goods and goods in markets will be carried out by Camcontrol; for street markets and restaurants surveillance will by MOH. Findings will be shared between agencies.
[113] MOH is in charge of reporting to INFOSAN, and Camcontrol is in charge of reporting to ARASFF.

grading system, definition of qualification of providers, and accreditation of providers are therefore needed. Such a system should be first implemented in Phnom Penh (where RGC agencies are strongest), and then later expanded to Siem Reap and Sihanoukville.

89. Thirdly, there is the desirability of a study on the possibilities for Cambodia (in the framework of harmonization and cooperation among GMS countries) to use assessments by other GMS countries for first-time market access requests for processed food products. Similar country-specific studies could then be conducted in Lao PDR and Viet Nam (and possibly also in China and Thailand), followed by regional consultations aimed at adopting a cooperative system for sharing information about first time access assessments. Support could subsequently be given to the possible implementation of such a system in Cambodia.

4. Academic Education

90. The institution of most relevance to SPS capacity in Cambodia is the Royal University of Agriculture (RUA). RUA has a complex governance structure: it is an autonomous body administratively located within MAFF, and receives guidelines and accreditations from MAFF.[114] In terms of its education policy (e.g., the criteria for awards determination, target numbers of students etc) it is responsible to the Ministry Of Education, Youth And Sport (MOEYS), and for its operating budget and financial issues it is responsible to Ministry Of Economy And Finance. RUA has a Board of Directors comprising 10 members from 8 institutions (Ministries, etc), but it has little influence on funding levels.[115]

91. RUA is comprised of eight faculties (i.e., agriculture science, animal science and veterinary medicine, forestry, fishery, agriculture technology and agroindustry, economics and rural development, and land administration and management); there is also a separate graduate school, research institute and basic science unit. This structure is relatively complex for a comparatively small academic body. RUA has 219 staff, of whom 68 are women. Of its staff, 129 are full-time teaching, 53 are part-time teaching and 37 non-teaching staff. Among the staff are 13 PhDs (up from only 4 in 2005), and many Master's graduates (up from only 16% of staff in 2005). The level of English language skills among staff is apparently generally sufficient to be able to access current academic literature, although significant numbers of students struggle to complete assignments that require technical language skills in English.

92. RUA provides education at Associate level, Bachelor's level, Master's level, and PhD level. As well as full-time Bachelor's training there is a weekend Bachelor's program – currently with just under 500 students (about 10% are women). Master's training is currently largely in the form of weekend courses, although a full-time Master's program is being planned. RUA also undertakes specialist *ad hoc* training courses (e.g., for MAFF, MRD, MOWRAM etc, and NGOs – sometimes in the form of the provision of training teams). RUA has 2,613 registered students (in 2010-2011), of whom just under 500 are women (i.e., 496, or about 18%).

93. The largest faculties are agriculture science (509 students, 92 are women), veterinary medicine (608, of whom 81 are women – these numbers have gone up significantly in the last couple of years), and economics and rural development (640, of whom 181 are women). Apart from agro-industry, (with 156 students – 41 women) other faculties tend to have around 100 students at any one time. MOE has indicated target student numbers of around 3000 would be desirable for RUA, in line with national objectives to expand higher education. Demand for RUA graduates is strong; since 1998, about 40% of

[114] The accreditations have to be approved by the Council of Ministers, however.

[115] This can raise issues of conflict for RUA in terms of setting of technical policies and academic orientation that may not subsequently be matched by financial resourcing from the RGC budget.

graduates have gone into government,[116] about one-third to NGOs, 13% to the private sector, 5% have started their own business.[117]

94. RUA has quite a wide range of international contacts with other universities (e.g., in Canada, France, Germany, Belgium, Japan, Indonesia, Thailand/AIT, Singapore etc) for small collaborative research projects, for guest lectureships, student and staff exchanges – mainly 4th year students and staff for short periods), though no faculty-wide programs for academic staff skills upgrading or training.

95. RUA's laboratory facilities are fragmented - being split between a number of different locations – with consequent duplications of equipment, and typically resulting in relatively small laboratory sizes (with implications for high overhead costs and lack of scale economies in operations). The gross stock of laboratory equipment is considerable – typically donated by a plethora of agencies including Japan (JICA), Korea (KOICA), Australia (AusAID), Sweden (Sida), EU (EuropeAid), US (USAID) etc. Much of this stock is not working - spare parts are missing and/or the equipment is relatively old and acquired second-hand originally by RUA. Despite the existence of a wide range of laboratory facilities across the faculties, there is a notable absence at present of a good microbiological teaching laboratory at RUA.

96. About one third of students are presently paying their own fees (these are some $390 a year in 2010-2011), while the remainder of the student body is on RGC scholarships. RUA's estimated income from fees and other own sources in the current academic year is $655,000, and it has requested $1.6 million from MEF as an operating budget for the year (the status of this request is pending). The current proposal to MEF represents a more than doubling of the budget RUA was receiving a few years ago (e.g., in 2005-2006 RUA received about $650,000 from MEF) – and indicates the seriousness of the operational funding situation for RUA. By this is meant that the level of recurrent funding RUA receives from RGC is insufficient to do anything beyond paying for maintenance and utility charges etc. All activities involving recurrent budgets are dependent upon donor or partner support – there is insufficient funding even for undergraduate course materials (e.g., lecture handouts, course notes etc). In sum, RUA is continually reliant on RGC allocations to function at all; worse - the real value of these has been going down in recent years.

97. In 2009, RUA held a workshop to develop a Strategic Plan - and specifically to consider ways to diversify its income sources, given its parlous financial base. The present constraints to this aim are considerable: (i) the opportunities to increase fee-paying student numbers are limited by physical facilities; (ii) consulting opportunities are modest for most staff (although some members of the various faculties are able to secure international/donor research funding); and, (iii) the opportunities to secure fees from laboratory-based service provision (e.g., such as performing tests required by regulatory regimes) are limited by the small size of the local private sector, competition from government facilities which could perform the same services in any case, and by the absence of an enforced regulatory regime in any event.

98. This funding situation particularly compromises the quality of the practical components of courses, where the numbers of farm visits/inspections, the chances for animal handling, etc are greatly diminished. In effect, for many SPS-related courses, the theoretical content is all that students are exposed to. This greatly diminishes the quality of many of the curricula, which – *prima facie* and in outline – appear to cover many subjects reasonably well (with the exceptions of some major topics in plant health, animal health,

[116] MAFF used to take about 100 graduates a year until two years ago, when demand essentially halted.

[117] The employment of the rest (13%) is unknown.

food safety and current SPS requirements). It also of course affects the function of laboratories across all the faculties within RUA, as the absence of operational funding means that the relatively high costs of spare parts, consumables, etc simply cannot be met from available resourcing.

99. For example, in the Faculty of Agronomy, there is only very basic technical and laboratory support for the various disciplines that constitute a sound foundation to plant protection education, and it is doubtful that the practice component indicated in the Plant Protection curriculum[118] can be delivered. Within the Faculty, a modest weed science laboratory exists[119], and an Open Source-based identification tool for the weed species of paddy fields in Cambodia (and Lao PDR) is used and updated. Specimens of weed species collected and identified are organized in a small herbarium in cabinets, and the Entomology laboratory holds preserved and pinned specimens of insects (largely collected by students). In the absence of a good microscope with digital camera attachment, specimen images are not digitized and organized in a database, and the information that accompanies specimens does not meet ISPM requirements. The Plant Nematology Laboratory has some rudimentary self-constructed apparatus for the sampling and extraction of plant nematodes from soil. At the Research Centre, there is a Phytopathology Laboratory seemingly dedicated to research activities related to two important citrus diseases - the Citrus Tristeza Virus (CTV) and the Citrus Greening Disease (also known as Huang Long Bing - HLB). On-going activities include the detection and diagnosis of these two diseases by Enzyme-Linked Immuno-Assay (ELISA) and PCR analyses, and the production of virus-free planting materials in the greenhouse; however, this is an externally funded research activity, and the laboratory is not actively involved with the teaching of plant virology to students.

100. In animal health, RUA's Faculty of Animal Science and Veterinary Medicine (FASVM) provides 4-year bachelor level degrees in veterinary medicine and animal science. The veterinary course has experienced a rapid increase in student numbers in the past 2 years with 165 students in Year 2 compared to 48 in the final Year 4. Employment demand for graduates is strong. Teaching capacity is low, however. The faculty has 21 teachers, of who only 2 hold veterinary qualifications. An increase in qualified veterinarians able to provide instruction in the later years of applied veterinary skills is required. The curriculum covers the expected elements of a veterinary course, including topics of specific interest to SPS strengthening (such as meat inspection, disease surveillance, veterinary pharmacology, veterinary public health and zoonosis). There are, however, only very limited teaching materials available, and the curriculum itself requires a comprehensive upgrade. Current teaching makes little use of practical teaching aids and demonstration specimens; this severely limits the ability to effectively teach core courses such as anatomy, cytology and pathology. (Any future curriculum development must therefore be augmented by provision of these essential teaching materials). The recent OIE PVS findings vis-à-vis the status of veterinary education in Cambodia are consistent with this analysis, and are summarized in Box 1, (below).

[118] Courses in the curriculum include Entomology (2+1credits), Microbiology (2+1) in the Foundation year; Entomology (2+1) and Weed Science (1+1) in the Second year, and Plant Protection (1+1) and Plant Pathology (1+1) in the Third Year.

[119] Provided by the EC-funded Open Source for Weed Assessment in Lowland Paddy Fields (OSWALD)

Box 1: Findings on Veterinary Education in Cambodia
(Source; 2007 OIE PVS report on Cambodia, page 15)

Much of the educational infrastructure in the country was destroyed during the decades of war, and those devoted to agriculture and veterinary medicine were no exception to this. The academic qualifications of individual faculty members vary considerably, but generally appeared to be relatively low; there is also a strong reliance on adjunct professors or lecturers from outside organizations. Efforts are being made to rebuild with help from both international donors and the private sector. There are generally good relations with private companies, government personnel and NGOs, who provide placements for students-in-training (practicums), advice on research, research materials, and adjunct faculty. In particular, the Centre for Livestock and Agriculture Development (CelAgrid) has provided opportunities for students to undertake research projects.
While collaborations with the private sector and other external organizations is laudable, an over-reliance on such resources outside the university to deliver core program activities results in limited capacity to determine and develop the content of their program. Because of the integrated program, and the low academic staff qualifications, disease-related activities that in other countries would be considered to be the core of a veterinary curriculum are inadequately addressed. Graduates will not be capable of effectively carrying out disease management activities without further training either whilst practicing or outside the country. The schools are under-resourced. One of the schools (KCNSA) has no laboratory facilities; the RAU has laboratory facilities for feed analysis but none related to veterinary activities (such as parasitology, bacteriology, clinical or gross pathology, virology, serology). Again, there is heavy reliance on partnerships to deliver program. Having said all this, the basic organizational infrastructure, such as faculties and curricula, are in place to deliver educational programs, and many of the faculty staff are recent. There is good staff commitment and enthusiasm and with upgrading of staff training and facilities there is a real opportunity to develop a sound veterinary training program.

101. Overall, RUA has no microbiological laboratory facilities to provide practical teaching for all students from the different faculties; there is only a small laboratory room and limited microbiological equipment in the agro-industry faculty. Because this room has little space, classes for students to learn microbiological testing in food samples have to split into very small groups. The limited range of instruments further restricts the number of testing parameters that can be covered in the food microbiology course. There is no cooled incubator and anaerobic jar for anaerobe testing - such as for *Clostridium botulinum* and *Clostridium perfringens*. Moreover, there is a lack of safety provisions, such as a biosafety cabinet, which exposes students to risks while performing tests on pathogenic microorganisms. There is no facility to teach students in chemical testing.

102. FASVM currently has adequate access to classrooms, and it is expected that increased student enrollments will be able to be accommodated by rotation of teaching schedules. The veterinary course itself does not require investment in further laboratory facilities; however, a degree of upgrade is required for the anatomy, pathology and parasitology equipment currently available for laboratory teaching purposes. Access is also required to a teaching laboratory for microbiology to enable teaching of general and veterinary microbiology and to deliver a degree of diagnostic demonstration.

103. The present curriculum for food safety covers most of the relevant topics, but it needs more depth in: (i) the range of food safety hazards dealt with; (ii) modern food safety regulations; (iii) the role of the WTO SPS framework, including Codex Alimentarius standards; (iv) food testing; and, (v) preventive systems (such as GAP, GMP, HACCP etc). While the agro-industry faculty curriculum has several courses related to microbiology laboratory (such as General Microbiology, Food Microbiology, Food Safety, and Analytical Techniques for Quality Assurance), the present microbiological laboratory seriously constrains the quality of teaching in this area.

104. Overall, an analysis of RUA's present situation vis-à-vis SPS capacity constraints suggests the following are the **major investment opportunities:**(i) support to the RUA generally, in terms of a new microbiology laboratory (building and equipment), some

transport facilities (i.e., a small bus for staff and student transport and a 4WD pickup for field work), locally-provided English language training courses (to improve the ability of staff to access and understand reference text and teaching materials), and some modest financial resources to support better interaction between RUA and ministry staff (in the forms of inviting RGC staff to RUA as guest lecturers and to allow RUA staff and students to participate in surveillance, testing and diagnostics, applied research, etc); (ii) the further development of academic curricula (through technical assistance and visiting specialists); (iii) some selective upgrading of faculty (i.e., agronomy, animal science and veterinary medicine, and agro-industry) laboratory and teaching facilities; and, (iv) short courses for academic staff to address important gaps in skills for teaching SPS.[120]

105. For plant protection, this means detailed work at a microbiology laboratory housing a comprehensive set of equipment (plus support for the Weed Science Laboratory to continue its work in developing the database on weeds in the lowland rice ecosystem and its associated herbarium). Investment here needs to extend beyond rice to other crops, and -by giving attention to ISPM compliance - the laboratory can both raise the quality and coverage of plant protection teaching and also provide support to the GDA in its pest development efforts. (Small equipment support would add to the functionality of this laboratory). For the Entomology Laboratory, similar support is required; the insect collection should become an important teaching resource, and data collected to accompany specimens should begin to become ISPM-compliant. Similarly, the Plant Nematology Laboratory could be improved to teach students the extraction of nematodes from soil and plant materials and allow examination under the microscope for identification. (Support should also include the appropriate apparatus set-up for extraction and examination of pests). Student practice in Mycology, Phytobacteriology and Plant Virology should be conducted in a basic plant pathology laboratory. Besides practical training in the various improved laboratories, students need to be able to participate in fieldwork through working on pest surveys (e.g., at GDA or in the provinces), and the agronomy faculty could consider setting up 'plant clinics' to expose students to the kind of problems or questions that farmers face daily, particularly in terms of the range and diversity of pest and disease problems that may occur in the field.

106. In terms of curricula development, for plant protection this could cover basic disciplines of Phytobacteriology, Mycology, Plant Virology, Plant Nematology, and Weed Science. Support could also cover pest management principles - such as integrated pest management and the use of pesticides, as well as awareness of the supporting role plant protection sciences play in global agricultural trade. Better access to literature and teaching materials should take the form of support for purchase of related reference books, teaching aids (i.e., sets of microscopic and/or Powerpoint slides of insect/plant pathogen taxa and other electronic products).

107. Considering the current small number of teaching staff available, upgrading academic skills is best achieved through fairly formal twinning arrangements, where suitable academic staff from English-speaking regional countries can teach plant protection courses for a whole semester in a visiting capacity, mentoring local teaching staff and helping to prepare improvements in curriculum and teaching materials. This approach may be supplemented by donor-funded selective longer-term academic course scholarships to existing teaching staff.

108. For animal health, necessary investment includes supporting an increase in the number of teachers with appropriate levels of veterinary education. This would require investment in scholarships for both teachers and for a selected group of undergraduates to veterinary faculties in other GMS countries or regionally. (After graduation the undergraduates would be expected to return to join the teaching staff). Improvement of the

[120] Bilateral donors might complement any upgrading with a selective scholarship program.

veterinary curriculum would require initial technical assistance to: (i) assess the curriculum in detail; and, (ii) to prepare a structured development program. Such a program would involve regular inputs from visiting veterinary lecturers and teacher exchanges, and could be best accomplished by twinning RUA with another veterinary faculty in Asia.

109. Ideally a veterinary teaching hospital facility would form a core part of the facilities for teaching applied veterinary skills. However, this is not a cost-effective option at present, and it is more appropriate to support regular field visits by students and teachers to farms, for participation in disease surveillance activities, and for visits to sites of public health interest (e.g., slaughterhouses). A degree of veterinary field equipment is required to support these activities. Some upgrade is also required for current laboratory teaching facilities, with provision of equipment to enable practical demonstration and teaching in pathology, anatomy and parasitology. Regular visits also need to be supported to the National Veterinary Research Institute laboratory with the Department of Animal Health and Production for demonstration of sample handling, preparation and serology/virology and other diagnostic techniques. Apart from anything else, this would help to strengthen links between RUA and MAFF.

110. For food safety, necessary investments include a new microbiological laboratory in a shared facility that all faculties can utilize efficiently and cost-effectively. Such a laboratory needs to be equipped with necessary instruments for microbiological testing - such as deep freezer to keep reference microorganism, incubators, cooled incubators, biosafety cabinet, balances, microwaves etc. For the Agro-industry Faculty, investment is needed to strengthen capacity in its microbiological and chemical laboratories and expand student experience testing by providing a biosafety cabinet and small equipment to facilitate chemical rapid test kit for: (i) pesticide residue analysis in vegetables and fruit; (ii) aflatoxin analysis in cereals (by using the ELISA method); and, (iii) veterinary drug residue analysis in meat samples etc. Training courses in microbiological testing and food hygiene at regional and international level are needed in order to upgrade faculty staff to become specialists in this area. Curriculum upgrade and expansion to better cover the various aspects of food safety management under WTO SPS and Codex principles also need to be supported. Appropriate course material and syllabi need to be developed and upgraded simultaneously.

ANNEX 1:

SUMMARY OF REGULATIONS THAT HAVE AN IMPACT ON SPS MEASURES

In chronological order:

(i) Sub-decree No. 4 (February 1992) *Management and Quality Control of Industrial Products of Factories and Handicrafts*, provides for the operation and functioning of MIME with regard to registration and inspection of processing facilities to determine product standards and production systems.

(ii) Sub-decree No. 67 (October 1997) gives MoH the responsibility for controlling food safety and the management of food, in conjunction with cosmetics and pharmaceuticals.[121]

(iii) Sub-decree No. 69 on *Standards for and Management of Agricultural Materials* (October 1998) requires that whoever is dealing with manufacturing, formulation, import, storage and sales or transactions of agricultural materials (including pesticides and fertilizers) in the country, register their products with MAFF.

(iv) Sub-decree No. 17 (April 2000) *The Organization and Functioning of the Ministry of Agriculture, Forestry and Fisheries* has no reference to food safety responsibility, but the subsequent Sub-decree No.105 (September 2005) mandates MAFF to inspect food safety of all agricultural products from crop production to the last stage of primary processing.

(v) The Law of the *Management of Quality and Safety of Products and Services* - LMQSPS (June 2000) is the principal law for product quality and safety.

(vi) Sub-decree No. 42 (May 2001) on *Industrial Standards of Cambodia* mandates MIME in managing standards and standardization.

(vii) Sub-decree No. 64 (June 2001) on *Designation and Management of International Points of Entry/Exit* defines entry/exit points for international trade.

(viii) MoC Declaration No. 141 *(Prakas/*ministerial decision) on *Formation of SPS Enquiry Office (Point) under Camcontrol* (May 2003), nominates Camcontrol as SPS enquiry point and tasks Camcontrol to work closely with the National Codex unit and to create SPS awareness within the country.

(ix) Sub-decree No. 47 on *Hygiene of Food for Human Consumption* (June 2003) prescribes general procedures of hygiene of products destined for human consumption through the supply chain.

(x) Sub-decree No. 21 on *The Facilitation of Trade through Risk Management,* provides for greater inter-agency cooperation to develop risk-based profiles and procedures for trade facilitation.

(xi) Sub-decree16 on *Sanitation Inspection of Animal and Animal Product*s (1983) was amended on 16 March 2003 to comply with WTO measures.

(xii) Sub-decree 15 on *Plant Quarantine (*1983) relates to the prevention of entry of plant pest and diseases into the country through plant health inspection and quarantine facilities and the issuance of phytosanitary certificates, transit arrangements, plant health inspector's powers and enforcement penalties. The sub-decree was amended on 13 March 2003 to comply with WTO measures and there is now a Plant Quarantine draft law which could be endorsed by 2011

(xiii) *Law on Cambodia Standards* (March 2007) has a Sub-decree No. 12 (11 February 2002), the *Management of Standardization and Technical Regulations*

[121] This was further strengthened citing letters from the Council for the Development of Cambodia (No. 2175/05 KAK dated 4 June 2005 and No. 1788/05 dated 7 June 2005) to the Ministries of Environment and Health assigning them the responsibility "to collaborate in examining the hygiene and environment at restaurants and food stalls to ensure cleanliness to avoid contagious diseases".

which mandates ISC to develop, monitor and enforce product and process standards.

(xiv) *Law on Fisheries* (March 2006) provides for the Fisheries Administration of MAFF to be the competent authority, and defines the Administration's tasks.

(xv) Sub-decree No. 108 regulates *Slaughterhouse Management, Sanitary Inspection of Animal, Meat and Animal Products* (August 2007);

(xvi) Sub-decree on *Organization and Functioning of the Institute of Standards* (2008) stipulates that ISC will consist of four departments: (i) Information Department (ii) Standards Development, (iii) Training and Advisory Department and (iv) Certification Department and Regulatory and Accreditation Department;and

(xvii) *Prakas* No. UATH.BRK 868, is an Inter-ministerial *PrakasOn the Implementation and Institutional Arrangements of Food Safety Based on the Farm-to-Table Approach*, of the Ministers of MEF, MoC, MIME, MAFF, MOH and MOT, aiming to: (i) improve the implementation of food safety system for the protection of consumer health and to enhance Cambodian food export competitiveness; and, (ii) set up institutional mechanisms for facilitating and coordinating activities from different ministries and competent authorities related to food safety.

LAO PDR:

SPS SECTOR ASSESSMENT

PART A: INTRODUCTION AND BACKGROUND

1. Introduction

1. This document summarizes the conditions surrounding SPS capacity in Lao PDR, and provides a broad rationale for the proposed project investments.

2. Following this introduction, Part B provides a generic overview of Lao PDR's SPS institutional and regulatory frameworks, and its national SPS system capacity (in terms of risk management and surveillance, and also regarding diagnostic capacity). The SPS capacity of the private sector is also briefly summarized.

3. Part C then focuses in more detail on each of the specific SPS subsectors of: (i) plant health; (ii) animal health; (iii) food safety; and, (iv) academic education. In each of these subsector analyses, the format is that constraints currently affecting SPS performance are described in some depth, followed then by the various technical interventions which are proposed to ameliorate them.

2. Background

4. Lao PDR AFF recorded trade is growing fast; the value of food and live animal exports doubled from 2001 to 2007, with an average annual growth rate of 17%. Its composition in overall trade is still low, however - approximately 4% of total exports. Rubber and wood, make up about 20 percent of total Lao PDR exports. The primary agro-food products are coffee, cereals (rice and maize), vegetables and fruit, and live animals. There has been a decline in the share of recorded[122] live animal exports from 28% in 2001 to 8% in 2006.

5. For the past few years, rubber exports have grown rapidly, from less than US$0.5 million in 2001 to US$14 million in 2007; exports will grow much faster in future because of recent large-scale investment in plantations, mostly by businesses from China, Thailand and Viet Nam.[123]Europe is the main destination for coffee, with about 71% of the value of coffee exports. The UK imports preserved fruits and France is an importer of resin. Main food imports are cereals, sugar products, vegetables and fruit, and miscellaneous products. Thailand is the primary supplier of food products, providing significant shares of almost all food categories, (especially sugar and miscellaneous food products).

6. Lao PDR became an ASEAN member in 1997. Lao PDR has bilateral trade agreements on market access with China and Viet Nam and continues to negotiate with other countries including: Australia, Canada, Chinese Taipei, the EU, India, Japan, Rep. of Korea and the USA. It had already reached agreement bilaterally with the EU on goods but not yet services. In November 2004 normal trade relations were granted between Lao PDR and USA. Since the country applied to join WTO in July 1997, the membership accession process continues. Much work is still needed to make its laws and regulations conform to WTO agreements.

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[122] Lao PDR has long, porous borders; livestock trade is particularly sensitive to underreporting.

[123] Most agricultural exports to Lao PDR's neighbors are organized by companies from those countries.

PART B: SPS SECTOR OVERVIEW

1. The SPS Institutional Framework

7. The preparatory work for Lao PDR's WTO accession - including dealing with sector-level SPS issues - is led by a National Committee of Ministers (NCM). NCM is chaired by a Vice Prime Minister, and guided by two Prime Ministerial decrees. A Vice Minister of the Ministry of Industry and Commerce heads the secretariat. Under the National Committee there is a working group, comprised of Directors General from various ministries. Below the working group is a technical group with representatives from all relevant departments that include the heads of the relevant SPS offices, i.e., Plant Quarantine Division, Department of Livestock and Fisheries, Food and Drug Department and National Science and Technology Authority (NSTA).

8. Ministries concerned with SPS measures more generally at a day-to-day working level are: (i) the Ministry of Agriculture and Forestry (MAF) and (ii) the Ministry of Health (MOH). The Department of Planning in MAF is the designated SPS enquiry point, and MOIC is coordinating the WTO accession process across ministries.

9. The detailed SPS responsibilities of the ministries are as follows:

(i) **MAF** is responsible for safety of fresh food products. The Department of Agriculture is the location of the National Plant Protection Office (NPPO), and issues import permits and phytosanitary certificates; it has a laboratory and a national reference collection for pest and disease identification. The Agriculture Regulatory Division (ARD) of the Department of Agriculture (DOA) deals with agricultural inputs. The Plant Quarantine Division is tasked with the development of regulations governing quarantineand phytosanitary measures. The Division is also mandated with the development of pest lists for export commodities, and receives technical support from the Plant Protection Centre (PPC). Responsibilities for animal health and unprocessed animal products are with the Department of Livestock and Fisheries (DOLF). The National Animal Health Center (NAHC) is responsible for border controls, inspection and quarantine, animal movement control and veterinary certification and has central and regional disease diagnostic laboratories. There is also a Feed Laboratory. NAHC has the responsibility to regulate and monitor slaughterhouse facilities and it is responsible for registration and control of veterinary drugs.

(ii) **MOH** has the responsibility for safety of processed food, as well as drug and cosmetics control. The two departments involved in food safety are the Department of Food and Drugs (DFD) and the Department of Hygiene and Disease Prevention (HDP). DFD, together with its laboratory – the Food and Drug Quality Control Centre (FDQCC) – is responsible for analysis of domestic food and quality assurance of imported food. The Department of Hygiene and Disease Prevention is responsible for safe food practices (particularly food sold in the streets and markets).

10. As a result of the government's policy on decentralization and consequent high levels of local autonomy that obtains in Lao PDR, the implementation of food safety, agricultural health policies and the monitoring of pesticide and veterinary drug quality and use are carried out by provincial and local administrations, with planning and budgetary decisions largely being made in district offices. At times, the decisions made by provincial governors regarding suspending certain agro-based product imports and allowing international private agricultural production companies to have investment privileges (for example, waiving animal, plant and agricultural input import controls) are not compliant with the international

SPS agreement under WTO, and thus contribute to weaknesses in the country's overall SPS capability.

2. The SPS Regulatory Framework

11. The current SPS regulatory framework in Lao PDR is largely based on decrees and regulations. Laws relating to SPS measures are currently being elaborated,[124] and some have now been promulgated.

12. A summary of relevant regulations governing SPS measures includes the following:

(i) The Plant Protection and Quarantine Law was promulgated in 2009, and will be implemented by the Department of Agriculture/Plant Quarantine Division.
(ii) The Livestock Production and Veterinary Law was promulgated in 2008, and DOLF is now drafting regulations for implementation.
(iii) The Standards Law was promulgated in early 2008, and incorporates key principles of the TBT Agreement in the areas of technical regulations, standards and conformity assessment.
(iv) The Food Law (2004) and the Food Hygiene Law (2002) still need to be implemented fully - through the drafting of regulations (and possibly determining codes of practice that correspond to the articles within the law). The Food Law lacks clarity; although articles 13 and 14 specify that food should be healthy and safe, there are no hazard avoidance measures written into the law, and the regulations on the Control on Production and the Exported-Imported Safe Food (2006) make only a cursory reference to GMP for processors.
(v) MOH and MOIC have regulations on the import and export of food, the safe processing of food, bottled drinking water, food additives and hygiene.
(vi) MAF has regulations on livestock and pesticide management. Pesticide management includes control through registration of import, sale, transport and storage of pesticides, and
(vii) There are 25 categories of goods subject to import approval.[125] These are non-tariff measures, based on restrictions that are concerned with food safety and spread of pests and diseases, particularly for products such as live animals and fish, meat, beverages, milk products and animal feed.

13. In general, Lao PDR's legislative and regulatory framework for food safety and agricultural health does not yet meet the basic requirements of WTO SPS nor of AFTA; in particular, transparency is limited. Currently there are very few legal specialists in the ministries to improve the legal and regulatory framework and they have little experience with international law and foreign languages.

14. In terms of SPS-related policy at sector level: (i) during 2006 the government endorsed the *SPS Action Plan* (prepared as part of the DTIS process),[126] (ii) the *National Food Safety Policy*[127] was adopted by government in 2009 – it includes roles and responsibilities in case of emergency response; and (iii) to facilitate cross-border trade, the

[124] Legislative reviews have been undertaken by the EU Multilateral Trade Assistance Project, FAO and some donor support projects.
[125] Notification on list of goods subject to import-export control and prohibition No:. 1376/MOIC.DIE, October 2006.
[126] The SPS Action Plan contains 29 actions that combine policy reform, capacity building, and improvement of the investment climate, with an estimated cost of US$9.75 million. Later analysis showed that the costs for upgrading SPS capacities were significantly underestimated.
[127] 028/PM

government has reduced the number of agencies represented at border checkpoints to 3 agencies: namely, immigration, customs and quarantine.

3. State SPS System Capacity

15. Overall, Lao PDR's present SPS management capacity is weak, and its implementation does not yet meet WTO and AFTA requirements. The absorptive capacity of numerous government agencies in particular is a constraint to fully implement a national SPS management program, and this has only been partly addressed through recent donor-supported initiatives.[128]

16. **In terms of risk management and surveillance,** inspections and border controls are not yet science-based and risk-based, and systemic implementation is weak. There is too much discretionary power at the provincial level, and rent-seeking behaviour on the part of officials abounds. There are no active surveillance programs, and no comprehensive databases on: (i) the prevalence of food and water-borne human health hazards and food contamination; (ii) plant pests and diseases; (iii) animal diseases; and (iv) the quality and safety of agricultural inputs. Data collected through inspection and passive surveillance are insufficiently analyzed and used for the design of policies and inspection programs.

17. For dealing with animal health, there are two main (donor-funded) surveillance projects supporting DOLF: (i) FMD control in the north of the country and (ii) AI monitoring and surveillance. With support from New Zealand, Lao PDR has developed a pest lists for maize[129] and vegetables. (The pest survey work was undertaken in 2008 and 2009). To date, Lao PDR lists only 81 regulated pests and diseases, which is a relatively short list compared with those of its GMS neighbors. Some spot testing is carried out in the provinces using Thai rapid test kits for the presence of carbamate or organo-phosphorus insecticides.

18. Lao PDR has practically no capacity to undertake risk analysis for food safety and agricultural health management. The main obstacles are: (i) the lack of technically skilled human resources; (ii) limited diagnostic facilities; (iii) inadequate, operational funds; and, (iv) and absence of databases.

19. Under the Trade Development Facility an interdisciplinary Risk Evaluation Group is due to be established to try and strengthen risk management and surveillance.[130]

20. FDD attends as an observer to the APRIS work on the ARASFF, and will apply for full membership during 2011. INFOSAN is used and information is received, but (as yet) distribution of the information is a problem - in terms of the means of communication and to whom to send the information.

21. **Regarding diagnostic capacities,** the available institutional and laboratory facilities for managing food safety and agricultural health (plant and livestock) are weak in Lao PDR. Present facilities are underutilized largely because of lack of government budget allocation for recurrent expenditures. Human resources for identification, diagnosis and testing of: (i) food and water-borne human health hazards and food contaminations; (ii) plant pests and diseases; and (iii) animal diseases, are also all weak. Available staff are few, and general levels of education and training low. The situation is further aggravated by low language skills in English - limiting the use of available international literature. Moreover, the

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[128] For a summary of recent donor support to SPS in Lao PDR see *GMS SPS Action Plan,* Appendix E.

[129] Sweet corn, baby corn and feed corn

[130] It will be staffed by four full-time government experts, with backgrounds in cost-benefit evaluation, food safety management, plant health management, and animal health management.

laboratories don't have an active surveillance program, which means that they depend on other agencies for sample collection.

22. In terms of specific laboratory capacity, the situation can be summarized thus;

(i) The **Food and Drugs Quality Control Centre (FDQCC)** laboratory deals primarily with the analysis and presence of pharmaceutical drugs and narcotics. The Food Safety Section of the laboratory has until recently been its weakest element. However, for microbiology the laboratory has a program in place with UNIDO support to become compliant with ISO/IEC17025 for tests on Total Plate Counts, fecal coliforms, *Escherichia coli*, *Staphylococcus aureus*, yeasts and molds. The laboratory may gain accreditation in the near future. The Thai government provides basic laboratory training for two persons per year, and pesticide residue testing is also carried out in Thailand. With support from NZAID, FAO has provided gas chromatograph (GC) equipment to undertake some pesticide residue work. The food safety tests are mostly for the formal sector, e.g., bottled drinking water, groundwater for drinking, samples from food establishments, and food imports from companies. Virtually no tests are done on food safety in the informal market. Currently the testing for heavy metals in water and foods by FDQCC is limited to use of facilities at the Water Board laboratory in Vientiane. (This facility is not accredited). Mycotoxin testing facilities have recently been established with FAO support, but are not operational yet. HPLC equipment has been installed for testing mycotoxins among others.

(ii) The **National Animal Health Center (NAHC)** performs analyses of animal parasites and diseases, and tests and certifies the safety of unprocessed livestock products and animal feed. The Center is divided into five diagnostic units, namely Avian Influenza (since 2004 with FAO support), Bacteriology, Parasitology, Serology, and Rabies. Like FDQCC, its analytic program is limited by its operating budget. The Animal Feed Laboratory collects and analyzes samples from the feed mills. Apart from some limited mycotoxin testing the feed laboratory does not test for feed safety, just nutritional value and constituents. Fish disease diagnosis is done by NamXuang Aquaculture Development Center and Living Aquatic Resource Research Center. There is no capacity for testing for pesticide and chemical residues in meat and fish. The diagnostic infrastructure also includes six animal disease diagnostic laboratories in the provinces that can perform simple parasitological tests. Most of the diagnoses, however, are performed at the NAHC laboratory; the provincial laboratories provide support in the collection and preservation of samples. On the border with China, there is a small laboratory (already with equipment but not yet operational). NAHC is weak with regard to the limited number of trained staff; there are only generalist veterinarians and para-vets with non-specialist agricultural training at the Agricultural College (Diploma) or the Faculty of Agriculture (Bachelor of Science); there are no specialists for pathology.[131] The quality assurance system of the Animal Feed laboratory is likewise hampered with limited staff, inadequate equipment and methods of analysis, and often-unavailable chemicals and reagents.[132]

(iii) The **Plant Protection Center (PPC)** has been improved and equipped since 2003. However, at present there is no HPLC or GC equipment, and the Atomic

[131] The country has a total of 50 veterinarians, of whom 30 work for the government.

[132] There is also a Food and Drug Committee to review veterinary drugs, the responsibility for which is under MOH. Lao PDR cannot comply with the ASEAN harmonized drug registration system and there is no market surveillance of drugs and no analytical capacity, including via NAHC.

Absorption Spectrometer (AAS) is presently out of order. The laboratory is underutilized due to power-supply problems and (again) limited recurrent expenditure budget. There is no annual work program, and the Center gets few samples for testing. There are significant deficiencies in systems, documented procedures, physical assets, laboratory management and, most importantly, skilled human resources. The taxonomic sections of the Plant Protection Center have minimal and basic equipment and identification keys. Arthropod taxonomic keys are minimal (mainly old), and focus on rice and vegetables alone. The private sector has to pay for tests. The result of this capacity level is that there are only modest capabilities for the identification of some significant pest groups, including virus and virus-like organisms, bacteria, fungi and weeds.[133] The Center produces some biological control agents. The chemical and microbiology laboratory of the PPC is mainly used for fertilizer (compost) analysis and registration (NPK[134] using auto-digester methods), bio-control (bacterial and fungal agent multiplication), seed testing (mainly simple germination and vigor), and pesticide effectiveness using field bioassays. Some pesticide quality testing has been undertaken in Viet Nam. The National Agriculture and Forestry Research Institute (NAFRI) also incorporates fertilizer and soil testing capability.

4. Private Sector SPS Capacity

23. Lao PDR's private sector is comprised of mainly micro- and small-sized enterprises and unregistered household businesses; 97% of manufacturing units have less than 10 employees.[135] The number of larger agribusinesses is not known - however there seem to be over 100 companies producing bottled water alone. Given this kind of domestic enterprise structure, the private sector capacity to address SPS issues is inevitably limited, despite the recent large increase in Lao PDR's AFF trade and the consequently ever-growing awareness of the need to address them.

24. In terms of the most dynamic areas of private sector activity, Lao PDR is presently experiencing rapid growth of agricultural commodity exports. This is being generated by a combination of improved infrastructural connectivity, abundant land for cultivation, and capital (and sometimes technology) provided by investors from China, Thailand and Viet Nam (who often get land concessions from provincial governors and export their products to their home country). Conditions granted under many of these concessions are that companies can import seed and agrochemicals without controls from phytosanitary authorities.[136] There are reports of excessive use of dangerous agrochemicals, imports of unauthorized propagation material, and of companies that reject admission of Lao PDR inspectors to their premises.

25. The interest in promoting agro-based food export enterprises (e.g., by IFC - via the Mekong Project Development Facility, donor agencies and NGOs) in recent years has mainly focused on support for individual enterprises, small farmers participating in various contract farming arrangements, on niche markets, on regional business clusters, and (more recently) in organic farming. The impact of these scattered efforts is difficult to measure, but seems so far to be relatively limited. The main export successes have been generated by the Chinese, Thai and Vietnamese agro-based investments, and donor support from outside the region has hardly any contact with these investors. Less donor effort has been devoted

[133] *Phytosanitary Capacity Evaluation* by NZAID.

[134] Nitrogen, Phosphorus, and Potassium

[135] The number of registered enterprises amounts to 88,045. Ministry of Finance Tax Department (2007)

[136] A background reason for these "extraterritorial" rights may be that the Lao PDR political hierarchy and concessionaries consider phytosanitary authorities too weak to perform routine cost-effective controls. However, the solutions adopted are at odds with principles of the international trading system, and result in increased sanitary and phytosanitary risks and, ultimately, an undermining of national SPS capacities

to removing investment climate constraints for agribusiness exporters and investors and addressing support for medium to long-term strategic commodity-based export strategies. Supply chain studies have been completed for actual and potential export products[137] but (to date) it has been difficult to design leverage mechanisms to achieve impact at a scale that can be funded by donors or international agencies. In these conditions, private enterprises' capacity to meet growing SPS requirements has understandably remained modest.

26. There is limited foreign investment in food processing, and the domestic industry consists of over 1200 registered small and medium sized enterprises.[138] Products of these businesses include drinking water, ice, canned food, meatballs, ice cream, milk, noodle, beverages (soft drinks, fruit juices), fruit candy, tapioca, roasted coffee, etc. Almost all of these factories are located in Vientiane Capital, and cities in Vientiane Province, Champassak and Savannakhet. Currently only 17 Lao food processors are reportedly exporting formally, and of which enterprises only three of their factories presently have HACCP certification.[139]

27. Likewise, food safety compliance in the country is relatively new. The Food and Drug Department (FDD) is working towards improvement of food processing by introducing food hygiene practices that will lead to GMP in some processing plants. FDD is also providing training for bottled water processors in GMP and awareness in HACCP and its implications, but (as yet) most businesses are only compliant with sanitation operating procedures. FDD is starting to roll out hygiene and sanitary practices procedures to noodle soup and meatball processors, and there are some BDS providers that do offer technical assistance to businesses on a commercial basis. Until recently there was a lack of development potential for GAP (unless production units were supported by an export-orientated supply chain).[140] Lao PDR does not have a certification body for quality assurance systems (i.e., ISO 9000, ISO 14000, and HACCP), and enterprises that want such certification must still use foreign providers (usually Thai certifying bodies).[141]

PART C: SUBSECTOR ANALYSES

1. Plant Health

28. Knowledge of the status of plant pests and diseases is pre-requisite to both the protection of a country's agricultural crops and vegetation from the incursion of alien pest species as well as to its ability to engage in AFF trade with other countries (both regional and global). Lao PDR is witnessing growth in the volume and value of agriculture crops and food products that are actually traded and potentially tradable, and the country increasingly urgently requires a level of plant health management capacity to meet WTO compliance requirements (and also wider sectoral and national economic objectives).

29. The institutional setup to carry out various functions necessary to maintain a national phytosanitary system are (building on the outline provided earlier at the sector level) as follows: the DOA of MAF is the designated NPPO for the country, the PQD has responsibilities for the regulation of phytosanitary measures, while the PPC is charged with responsibilities for conducting pest surveys (for the development of pest lists to support risk analysis and market access). PPC hosts basic diagnostic facilities and a modest pest and disease reference collection and database. The Agricultural Regulatory Division within DOA

[137] Most recently by the World Bank managed TDF for vegetables in Champassak, and IFC and World Bank together on rice, cardamom, coffee and tea.
[138] And - most likely - a much larger number of unregistered small and micro-enterprises.
[139] These are Thai Lao Agro Industry, Lao Brewery and Lao Asia-Pacific (Tiger beer).
[140] STDF funded an investment grant to assist DOA in designing a project aiming at setting up legislative and institutional infrastructure for the implementation of GAP
[141] UNIDO (2004).

is responsible for registration and quality of pesticides and other agricultural inputs. MAF shares responsibility with the DFD when it comes to the proper use and safe levels of pesticides in food and food products, safe formulations of fertilizers and pesticides and the presence of heavy metals and other pollutants in soils and fertilizers.

30. The capacity of these institutions to provide adequate and required plant health coverage is inadequate to meet the demands of a modern AFF trade-related SPS system. The main issues that are involved in building plant health capacity in Lao PDR, and thus the constraints that must be overcome, are as follows.

31. Firstly, central to management of effective phytosanitary systems are the functions of surveillance and monitoring, preventive risk management, and support for informed decision-making in public policy and responses. To manage phytosanitary risks, surveillance and monitoring are preferred over border control in countries with long and porous borders; in this respect border control is particularly inefficient in Lao PDR, given the length of borders, and the low capacity of plant health border personnel. Pest surveillance in Lao PDR is presently very much an *ad hoc* activity, although external aid (i.e., from Australia under the SPS Capacity Building Program - SPS CPB and the ASEAN Australia Development Program – AADCP, and New Zealand - under the Phytosanitary Capacity Program for the Mekong Region) have in recent years supported more sustained efforts in surveillance for particular crops, such as mango, maize and cabbage.[142]

32. Secondly, Lao PDR presently has very weak capacity to regulate the marketing (including importing) and use of agrochemicals. As a result: (i) economic losses occur to farmers using products whose active constituents and composition may not be what is stated on their documentation; (ii) producers are at risk from the use of harmful and/or banned chemicals; and, (iii) consumers are at risk from high residues of pesticides and herbicides. In other words, substandard product quality, adulteration and contamination not only translate into higher cost of inputs in farm operations, but also represent hazards to human and environmental health.

33. Domestic testing and analytical capacities are inadequate, and there are no effective surveillance programs in place. With the growing commercialization of agriculture in Lao PDR, the use of agrochemicals is increasing (especially in areas of rapidly growing commercial and export-oriented contract farming), with a concomitant rise in weaknesses in agrochemical use practices. Most agrochemicals currently used in Lao PDR agriculture are informally imported – from Thailand, from China, from Viet Nam; for most suppliers, Lao PDR is a marginal market whose size does not justify the entry costs involved in either developing or branding locally-specific products (e.g., with Lao language labelling) or dealing with Lao PDR government agencies. PPC has responsibility for the analysis of commercial pesticide and fertiliser product formulations and quality, but - due to a lack of basic equipment (e.g., analytical instrumentation) and physical infrastructure - its responsibility of supporting the Agricultural Regulatory Division in registration of agrochemicals is restricted to the evaluation of submitted documents accompanying formal applications for import and domestic use. Analysis of pesticide residues in primary crop produce in the field and marketplace has typically been carried out with the use of rapid kit tests.

34. Thirdly, the large volume of formal and informal border trade in wood and forest products and the large contiguous transboundary forest areas together pose enormous threats to the movement of forest pests and diseases (some of which may have host ranges that extend beyond forest species and to other, more commercial, crops). Despite the large volume of trade in forest and wood products between GMS countries, there has been little

[142] These programs have also made it possible for the taxonomic identification of a larger number of pest specimens collected from surveys, but PPC staff can generally identify these to genus level only.

regional cooperation and sharing of information in relation to the phytosanitary risks associated with this trade. A large amount of wood products cross Lao PDR's borders and the country is unusual in Southeast Asia in having relatively large areas of forest extant; it is therefore especially important to mainstream forest health into its national SPS processes so as to promote safe trade in these products and also protect the national natural resource base.

35. Fourthly, Lao PDR does not practise post-entry quarantine for seed and other plant propagation materials, despite the fact that these can serve as a significant pathway for the introduction of unwanted pests and diseases into the country and there are major concerns that invasive pests readily move across common borders in GMS trans-border trade. At present, under-equipped and inadequately trained border inspectors - and the lack of good data - prevent effective decision-making in phytosanitary risk management at the border points.

36. Fifthly, Lao PDR cannot meet China's SPS and quality requirement for exports of crop products. Lao PDR's exports of crops, especially corn, rice, cassava and fruits have been growing quickly in response to improved physical connectivity and growing domestic demand within China. In 2009, recorded imports of grains to China from Lao PDR amounted to $15 million, and fruit and vegetables to $5.6 million. However, the actual amount traded is much higher because of tens of thousands of tons of informal border trade are not captured in trade statistics. China is concerned with the quality and safety of the products (especially corn) and the related phytosanitary risks and, accordingly, wants to replace informal border trade by formal trade (ideally under a bilateral agreement incorporating bio-security requirements). Such requirements for formal exports for corn are difficult to meet, however; they include significantly tightened phytosanitary and residue surveillance and control, traceability, and GMP requirements for processing, storage, transport, packing etc. [143]

37. MAF – which has the primary responsibility for this trade – has not yet built-up the capacity to manage these functions, and the Lao PDR private sector presently does not know what to do nor how to do it. To date, there is very limited registration of producers and private enterprises involved in the supply-chain, and there are no standards for products, inputs, no GMP, nor any trained inspectors or inspection manuals. It is also expected that similar Chinese demands for other products such as rice, cassava and fruit and vegetables will follow those being for with corn. Moreover, other countries in the region may also follow with similar requirements.[144] In short, there is little alternative but for Lao PDR to develop such capacities if it wishes to both sustain and expand its crop products' exports.

38. Given these kinds of issues and constraints related to plant health SPS subsector capacity, the main **investment opportunities** are as follows. Firstly, to build surveillance and monitoring capacity for plant pests and diseases, it is essential to strengthen survey-based data gathering and management, and to improve diagnostic and analytical services (these services all require investments in facilities, equipment, supplies and human capacity). Besides the strengthened reduction of phytosanitary risks that results to Lao PDR from better plant pest and disease information, survey data provides the needed material to describe the pest status in a country. The WTO/SPS Agreements require that pest information be the basis for market access negotiations, and many of Lao PDR's trading partners (e.g., China, for corn and cabbage exports) are now routinely asking for such technical information for pest risk analysis.

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[143] The requirements are somewhat similar to those in agreements between Cambodia (MAFF) and AQSIQ for milled rice (October 2010) and tapioca (13 December 2010), and what is being negotiated between China and Viet Nam on cassava and fruits, and also to the trade agreement for F&V between China and Thailand.

[144] In fact exporting fresh fruit and vegetables to Europe may become more demanding.

39. Necessary interventions to build surveillance and monitoring capacity in plant health need to be targeted at raising the capacity of the Plant Protection Center to better carry out pest and disease surveillance activities under its purview, including: (i) crop pest surveillance; (ii) diagnostics and taxonomic identification; (iii) post-entry quarantine (PEQ) for seed and other propagative plant materials; and, (iv) response to plant pest and disease outbreaks. To improve the pest and disease surveillance program, there is a need to move from an *ad hoc* approach to the implementation of a sustained and planned program of surveillance on priority crops (identified by the government – and to include coffee, maize, baby corn, cassava, banana, fresh vegetables, rice, tobacco, legumes, Job's ear and sesame), with scheduled completion dates. Taxonomic identification of survey specimens needs to be promoted (with regional support, and with access to external support for difficult specimens) to expedite the diagnostics component of the survey, PPC staff need to be given on-the-job training, upgrading of current laboratory and equipment (including operationalization of the remote microscopy equipment donated under the SPS CBP) is urgent, and there is a need to improve curating of the specimen collection. The provision of a greenhouse is needed to initiate post-entry quarantine (PEQ) activities, and will serve the testing of seed and other planting materials. Improvements in data management from field surveys are needed so that a more comprehensive database from the information generated can be utilized as useful resource for pest identification, trend analysis, risk management and policy decision-making. Scholarships to regional universities, training attachments and English proficiency classes are needed to build the capacity and confidence of staff. Provision for participation in related regional meetings is also essential to raise awareness of Lao PDR personnel of global developments in plant health-related SPS processes.

40. Next, is the need for improved surveillance and monitoring of agrochemicals – specifically crop inputs such as fertilizer and pesticides. What is needed here is for upgrading of fertilizer and pesticide analysis capacity (i.e., requiring existing laboratories for agrochemical analysis to undergo refurbishment to accommodate the requirements of the sensitive analytical equipment and to allow for more accurate analysis and higher throughput in testing quality and formulation of commercial pesticide products). Similarly, participation in proficiency testing is needed to encourage better quality of laboratory practice. Enhanced monitoring of pesticide residues on farm produce is also needed, through annual programs of sampling and testing with rapid test kits (with provision for selected samples to be sent for more quantitative analysis for problem pesticide groups identified from the rapid test monitoring process, as well as pesticides not adequately covered by rapid testing).[145] Upgrading of human capacity through regional scholarships, study tours and participation in regional meetings is also needed.

41. Thirdly is the need to mainstream forest health into the national SPS compliance process. Guided by major international sources,[146] the main needs for Lao PDR in this respect are: (i) to develop a national situational analysis – i.e., which seeks to obtain a clearer picture of the phytosanitary scenario – and the forest pest situation and phytosanitary requirements imposed by importing countries; (ii) to establish a program of passive surveillance (involving collaboration between the Agriculture and Forestry Departments of MAF to collect and collate available information to describe and understand the forest pest

[145] It is important to note that use of the same facilities for testing pesticide residues and formulations present major risks. The risk of cross-contamination is highest in the sample preparation phase. Besides, levels of detection demanded in the analyses of the two groups of products differ significantly, so that the risk of false positives almost makes it mandatory to have separate equipment and facilities. In the case of the PPC, the better option would be to support the use of analytical equipment on formulated commercial products, and retain the use of rapid test kits for residues. Besides, until major surveillance programs are instituted on a regular basis, more detailed pesticide residue analysis can be outsourced to other laboratories, both within the country or to laboratories in neighbouring countries.

[146] See '*Guide to the implementation of phytosanitary standards in forestry'.* Dept of Forestry, FAO, Rome, 2010.

situation in the country;[147] and, (iii) to engage in regional consultation, providing a forum to identify common issues, weaknesses and opportunities for countries to work together to mainstream forest health into national SPS compliance processes.

42. Fourthly, is the desirability of improving import handling. A fundamental principle of the WTO/SPS Agreements is the use of risk-based decision-making in the imposition of phytosanitary measures. In formal cross-border trade this translates into requirements for phytosanitary risk management measures based on data pest status, import/export statistics and interception and non-compliance information. In the absence of this information, countries often take precautionary trade-restrictive measures across all commodities alike.

43. The main need here for Lao PDR is to introduce risk-based import management. Introducing this type of management will require: (i) risk categorization (where commonly-traded agricultural products are ranked according to the risk they may pose, and matched with appropriate risk management measures; this approach can then be evaluated from inspection and interception data to gauge effectiveness); (ii) development of standard operating procedures (including operations manuals incorporating details of procedures such as inspecting, sampling, etc), and staff training in their application; (iii) acquisition/development of visual guides that assist border inspectors in the identification of suspected pests and diseases;[148] (iv) production of SPS/ISPM awareness materials - explaining the global trading environment under the WTO, the SPS Agreement and its principles, ISPMs (especially those that are already adhered to under current national phytosanitary legislation and regulations) in simplified local language are essential to gain the understanding of border inspectors in their shift to changes in operating procedures;[149] (v) improved data management - proper and systematic capture and use of information on plant pests etc in AFF trade not only provides for the identification of threats and risks, but also the analysis of trends; (vi) use of ICT to reduce risk of use of fraudulent phytosanitary certificates;[150] and, (vii) monitoring of pesticide residues at border points.

44. As this is a completely new area, it may be best in the first instance to train border inspectors in the use of rapid test kits in a pilot area to conduct a monitoring survey of agricultural produce imported into Lao PDR. Data gathered here would supplement the activities of the PPC with respect to near-market and market produce, allowing for a more comprehensive study of the pesticide residue problem in the country, and for subsequent appropriate interventions at the border against problem sources.

45. Lastly, there are opportunities for investment to support capacity building in the public sector related to the supply chains of corn and rice. The work should start with awareness-raising among GOL officers, private sector entities, and crop growing farming communities. Value chain analyses should be conducted for corn and rice in five northern provinces, with a focus on identifying obstacles for compliance with export (i.e., Chinese) market requirements, and the identification of the main options for compliance and capturing value added through capacity building (including investments, public support programs, surveillance, testing, and regulatory improvements). Identified options would be discussed with stakeholders in government services, and with the private sector and farming

[147] Such a program would also provide the platform to raise the awareness of forest health personnel in the SPS Agreement and its requirements).

[148] Border inspectors thereby play an important role in “first level detection”; suspect materials may then be sent to the PPC for further investigations. Examples of these guides from neighboring GMS countries could serve as the basis for the development of locally appropriate materials.

[149] Such materials would also be useful for awareness raising among other phytosanitary personnel and stakeholders.

[150] A particular reputational risk for the country is the use of fraudulent phytosanitary certificates. With application of ICT on the border these risks can be reduced. A small investment in ICT on four international border posts would not only be useful for reducing risks of fraud, but would also help to improve service and intra-agency communication.

communities. Satisfactory compliance with export requirements will ultimately depend on the progressive adoption of improvements among suppliers (i.e., private enterprises and farming communities), in response to both economic incentives and adequate public support programs.

46. Promoted good practice on farms will include use of safe pesticides and certified seed, safe use of pesticides, and proper on-farm drying, shelling and storage (if it is done on the farm). Such farm practice improvements need to be supported by: (i) effective extension programs; (ii) good supply chain linkages (i.e., with providers of inputs and product buyers); and (iii) the public surveillance of safety of agrochemicals (i.e., pesticides and herbicides) in the market and residues of agrochemicals and mycotoxins in crops, and of the pest situation in the corn growing areas.[151] Private sector entities engaged in trading, drying, shelling, storing, packing and transporting should be supported to comply with standards for safe product handling - which will include good manufacturing practices (GMP). Support needs to be given to formulate adequate good practice standards and GMP, to train government staff (and other providers where relevant) as GMP trainers, inspectors and auditors, and to provide diagnostic score cards and inspection manuals. The private sector needs support in identifying measures to meet various good practice and GMP requirements, through training, individual advice from GMP advisors and documentation. Chinese government specialists and the Chinese private sector would be invited to participate in the support activities. [152]

47. Once an adequate system of supply-chain support for one product, e.g. maize production, has been developed and put into operation, it can be copied for other products, such as rice, cassava, fruits and vegetables. Although some costs for developing and implementing a program for other products will be similar to corn (e.g., the supply chain analysis), other costs will be cheaper - since some of the capacities created for corn can be applied to other products (e.g., expertise on GMP), and several other support activities can be adjusted or expanded for the need of other products.

2. Animal Health

48. The major animal health concerns in Lao PDR vis-à-vis trade-related AFF considerations center around four key issues: these are: (i) the control of transboundary animal diseases (TAD); (ii) the regulation and control of veterinary drugs and animal feeds; (iii) the management of animal food products' safety; and, (iv) the handling of animal and animal products imports. In addition there is need for general strengthening of the laboratories.[153]

49. Firstly, in the GMS - where many significant animal diseases are endemic –increases in trade flows of animals and animal products across relatively porous national borders are increasingly important determinants of the extent of management of animal disease more widely. According to official figures, Lao PDR is a net importer of animals and animal products from other GMS countries, although its informal exports of live animals are generally recognized to be substantial (many cattle are walked across borders to avoid taxes, informal levies and charges as well as formal import and quarantine restrictions, for

[151] As an overarching principle, the capacity building in all aspects of pest and agrochemical surveillance should, where possible, be oriented to promotion of exports, such as field crops to China and vegetables to China and Thailand, and main plant and human health risks in imports

[152] Initially capacity building in these areas would be dependent on international consultant input and input from neighbouring countries, since expertise is not available in the country, but both sustainability and domestic capacity expansion could be pursued by training (both on the job and through scholarships).

[153] Support is needed to furnish the new laboratories of animal health, food safety, and veterinary drugs, and to help improving laboratory management through calibration and proficiency testing.

example).[154] With improved road links, the country is increasingly important as a transit route for trade in animals and animal products - particularly between Thailand and Viet Nam. The effective management of TAD on a regional basis involves elements of prevention, surveillance, response and planning across all countries. For such cooperation to be effective, and for trade in animals and animal products to be able to grow on a safe basis, individual countries must have capacity to maintain surveillance of their disease status and to respond to identified animal health issues.

50. Lao PDR's disease status is similar to its neighbors (with diseases such as FMD and CSF being endemic, and with relatively frequent outbreaks occurring). However, currently the only significant active surveillance programs being operated in the country are for HPAI (under various donor funded projects). All other disease surveillance is essentially passive, with a limited degree of diagnostic testing being done for confirmation of outbreaks. The disease status of the country is not well defined, and reporting has been infrequent - with no 6-monthly or annual reports having been filed with the OIE for the past 2 years.

51. The management of animal disease is the responsibility of the Epidemiology Unit in NAHC of DOLF.[155] NAHC has relatively good diagnostic capacity in its laboratory, but presently lacks any operational funding to support further diagnostic work outside of HPAI. Budget constraints similarly limit the ability of NAHC staff to conduct surveillance activities, and limit their ability to effectively engage in disease response and control activities. As a result of this situation, data collection on disease incidence is intermittent and the ability of Lao PDR to report to trading partners (mainly in the GMS) on its disease status is limited.

52. Secondly, veterinary drugs and medicines are important inputs into livestock production systems (in terms of both maintaining animal health and improving production), and effective regulatory control is needed to ensure that these products are of appropriate quality and are utilized correctly. Inadequate regulatory control places consumers at risk of potential contamination of animal products with residues and increases the likelihood of incorrect usage (thus encouraging antiparasitic and antimicrobial drug resistance). Currently there is no effective regulatory control of the sale and use of veterinary drugs within Lao PDR. Government, via the Veterinary Supply Unit of NAHC, imports and sells veterinary drugs via a small set of outlets and specific arrangements with veterinary clinics. However, by far the majority of drugs are imported by the private sector for sale or use in larger commercial production systems – although there is no monitoring or control of these (and few import figures exist). There is no local production, except for very limited volumes of vaccines produced by the government Vaccine Production Centre. There is no capacity to test veterinary drugs for formulation, nor is there any monitoring of animal products for residues. Overall, this situation places consumers at significant potential risk and in all likelihood compromises the quality of animal health services provided. Further, without regulatory control Lao PDR is unable to provide credible assurances regarding the freedom of its animal products from potential residues.

53. Similarly, animal feed is a significant input for animal production systems (in particular for pig, poultry and fish growing) and represents an important risk pathway for animal health and disease issues, and for contamination of feed with compounds that may represent food safety risks to consumers. To limit these risks, it is important that the quality,

[154] Because of the informality of this trade, actual volumes and values are impossible to estimate, and especially so since Lao PDR has in recent years become a major transit route for animals from as far away as Myanmar and Bangladesh en route to Ho Chi Minh City and the south of Viet Nam. Even in the late 1990s, some estimates (e.g., World Bank) estimated the annual value of livestock exports to be worth as much as $60 million (see ADB TA 3063 LAO – *Smallholder Development Project*).

[155] A number of OIE listed diseases are notifiable under the Law on Livestock Production and Veterinary Matters (2008) and the responsibilities for disease control, monitoring of imports defined under two associated ministerial decrees.

production, importation, storage and use of animal feeds be conducted to appropriate standards. There is a regulatory role for government in setting these standards and monitoring compliance. Currently some 65,000 tons of animal feed (poultry/pig) is produced annually from a range of different sized feed milling operations,[156] and another 180,000 tons of feed, mostly for fish farming, is imported annually mainly from Thailand.

54. The regulatory[157] control of feed production and importing is managed by the Livestock Technical Standards Control Centre (LTSCC - under NAHC. The testing of animal feed for its quality is conducted by the LTSCC Animal Feed Unit (AFU). Approximately 500 processed feed samples are tested annually - for basic quality parameters and some limited mycotoxin testing - but no testing is conducted for bacterial hazards, chemical contaminants, growth promotants or antibiotics. Only limited inspections are conducted at border posts, and the surveillance of feed mills and sites of feed usage is very limited. In general, AFU staff has limited understanding of production practices at feed mills and of the importing and use of medicants or drugs that may be being added to animal feeds. Although AFU staff is aware of the use of some compounds (such as chloramphenicol and beta agonists) and of potential feed contaminants (such as heavy metals), it does not have the ability to test feeds for hazards of concern, and has very limited funding to conduct surveillance activities. Overall, the lack of regulatory control of animal feed represents a significant threat to the integrity of animal production systems, and regarding the exposure of consumers to residues in animal food products.

55. Thirdly, and in this regard (i.e., of monitoring inputs for production of, animal diseases of zoonotic concern, and of the hygienic production/processing of animal products), there is a public regulatory role in setting standards, monitoring compliance of production and processing facilities, meat inspection activities and testing of animal food products. Food safety of animal products is the responsibility of the Animal Products Quality Assurance Control Unit (APQAC) of NAHC. Although they have qualified staff, they have no dedicated laboratory facility and no testing capacity. Testing to date consists of limited microbiological testing (using the NAHC animal health laboratory facilities, and mainly centering around major tourist events).[158] At present, no testing is conducted for chemical contaminants or veterinary residues, and only limited inspections are conducted at border posts (reporting linkages with border staff are very limited). There are some legislated standards relating to meat inspection and animal products, but there are no technical manuals or procedures to guide inspections. A lack of staff training in provinces means the standards of meat inspection conducted are very low outside the main cities.

56. Fourthly, adequate control of the entry of animals and animal products is an essential part of ensuring Lao PDR is adequately protected from animal disease and food safety risks. Border control involves inspection of animals and products based upon an assessment of risk; these risks can be mitigated through the application of a range of inspection, testing, and quarantine measures. (These measures are usually set as import certification conditions and agreed between trading partners). A lack of effective or technically consistent border control thus not only raises risks of the entry of unwanted animal diseases and pests, but also the imposition of potentially unwarranted measures affecting animal and animal products trade.

57. Currently in Lao PDR there is only limited border control based on disease risk, with no processes for risk assessment and specification of import conditions available to provincial staff. As a result, most inspection activities are *ad hoc* and there is significant variation in standards applied between entry points. The central control of animal and animal

[156] The majority of the raw materials for this feed are imported from Viet Nam.
[157] Current legislation relating to feed is limited in terms of specific standards and practices.
[158] Some limited testing on fish zoonoses has also been conducted as part of donor-funded work.

product imports is the responsibility of the Epidemiology Unit (in NAHC) which presently has very limited technical capacity, while border posts are managed by (poorly-trained) staff from provincial- and district-level Livestock Field Offices.

58. Given these issues that most obviously constrain animal health subsector SPS performance, the main **investment opportunities** are as follows. To improve the situation regarding TAD, significant strengthening of NAHC's surveillance, diagnostic and response capacity is required. NAHC's ability to survey, test and respond for two priority diseases (i.e., FMD, CSF) needs to be strengthened in target areas with potential for domestic production and/or exports (e.g., within the Xieng Khouang and Savannakhet provinces respectively). The main objective is to improve control of diseases on a selective geographic basis, while simultaneously strengthening NAHC's generic surveillance and response capacity. Response to FMD and CSF outbreaks can utilize targeted vaccination and movement control measures, and stronger links can be established with SEAFMD (to support supply of FMD vaccine as required for outbreak response). Improved diagnostic capacity and testing (increased testing volumes based on upgraded NAHC equipment, refresher diagnostic training etc), development of a surveillance program in target areas (based on development of proper procedures, epidemiology staff training, scholarships etc), more frequent and regular surveillance visits and public awareness campaigns, improved response capacity (and accessing vaccines from regional stockpiles), improved data management (to record testing and surveillance activities and outcomes), and intensified regional cooperation (through participation in SEAFMD or other regional meetings and via some exchanged visits with other GMS countries to discuss TAD disease management cooperation) are also interventions which are all needed here.

59. To improve the situation with Lao PDR's ability to control veterinary drugs, the focus should be initially on improving knowledge of the nature and quality of products in the market place and on strengthening of the legislative framework in regard to licensing, approval, sale, storage and use of veterinary drugs. The use of veterinary drugs is covered under the Law on Livestock Production and Veterinary Matters (2008), but it does not contain adequate detail on regulatory controls or standards; a suitable regulatory framework with appropriate sub-regulations and standards (to cover the approval of veterinary drugs, registration, certification for imports, records of importation, formulation testing, and standards for sale, storage and usage etc) is still required, and its development should be given priority.[159]

60. To support an improved regulatory framework, a monitoring program for veterinary drug formulation is needed. Testing for veterinary drug formulation requires specialized equipment with high maintenance costs, and it is unlikely that Lao PDR could sustain a full range of this type of testing capacity, or duplication of capacity in DOLF and FDQCC. A cost effective option is to test part of the drugs at FDQCC (for which it has capacity)[160] and to send other samples to another GMS country (such as Thailand or Viet Nam) for formulation testing. In the first year of any investment an extensive market survey should be undertaken, followed by reduced numbers in subsequent years (when a better understanding has been obtained of the main risks in the market). Technical training for DOLF staff, regular

[159] In drafting such regulations, reference will need to be made to the regulatory frameworks and standards of other GMS countries, particularly Thailand and Viet Nam, which are the main sources of drug imports. It may be expected that an important part of the regulatory system will be ensuring adequate formulation testing certification is available for imported products; this will require agreeing certification and formulation standards with other GMS countries. Consultation will also be required with stakeholders during the drafting process and consideration will need to be given to an appropriate fees structure to enable sustainability of associated monitoring programs.

[160] FDQCC has capacity for several antibiotics readily available (such as Ampicillin, Amoxicillin, Doxycycline, Tetracyclyne, Dexamethazone, Levanisole) and it could develop additional capacities for a number of other drugs (such as Gentamycin, Streptomycin, Enrofloxacin, Ivermectin) provided sufficient demand can be guaranteed.

surveillance visits by DOLF and provincial staff (to inspect farms, border points and retail sites to monitor compliance of products sold, their usage and to collect import data), improved data collection and management, and closer regional cooperation (to improve the level of understanding of DOLF staff on drugs production and regulation, and to facilitate harmonization of standards between Lao PDR and its main sources of drugs supply) are all required in the longer term.

61. Likewise with animal feed, a strengthened regulatory system is required – implying legislative review and drafting of appropriate sub-regulations and standards to cover the approval of production facilities, processing and quality standards, additives, certification for imports, records of importation, testing, and standards for sale, storage and usage. Improved testing capacity (utilizing rapid test kits and some upgrade of AFU laboratory facilities) is required,[161] supported by training of AFU staff on appropriate laboratory testing methods and sampling. With animal feeds surveillance, appropriate procedures need to be developed and then provincial staff trained, regular surveillance visits need to be conducted by AFU and provincial staff (to inspect feed mills, storage areas, mixing plants, farms, border points and retail sites to monitor compliance of feed production and feeding practices, to sample as necessary, and also to collect import data), improved data management (for recording of activities and outcomes), and enhanced regional cooperation (especially with Thailand, as the main sources of animal feed) are all needed.

62. Regarding food safety of animal products, the needs are similar – namely: (i) a legislative review of the regulatory framework (including the Law on Livestock Production and Veterinary Matters (2008) and two ministry decrees which specify regulations for meat inspection and for inspection of animal product imports); (ii) improved testing of animal products, based on new laboratory equipment[162] and laboratory training for APQAC staff. (Laboratory capacity would enable microbiological culture and identification and enable utilization of rapid tests for microbacteria, veterinary drug residues and chemical contaminants. This would need to be supported by training of technical staff on appropriate laboratory testing methods and sampling); (iii) technical training[163] and development of procedures for food safety surveillance (including the development of a specific meat inspection manual); (iv) improved and more regular surveillance visits to slaughterhouses, markets and fish processing facilities; (v) better data collection and management; and, (vii) improved regional cooperation.

63. Finally, improving the border situation vis-à-vis animal health requires strengthening technical capacity within the Epidemiology Unit to conduct risk assessment activities with the purpose of establishing risk-profiles of products for risk-based border handling. This needs to be translated into inspection manuals with procedures for border activities and the specification of differentiated import conditions for low, medium, and high-risk products. As in other areas, legislative review and drafting of appropriate technical regulations and standards etc, staff training on surveillance methods, greater resourcing for border visits, better data management and more regional cooperation are all required. Vehicles, technical equipment and supplies are all needed to implement improved border handling regulations - with priority at international border crossings, strengthened animal movement control and to assist in combating FMD and CSF.

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[161] Rapid test kit based testing would cover hazards such as nitrofurans, chloramphenicol, beta agonists (clenbuterol), aflatoxins, fluroquinolones and salmonella.

[162] There is currently no dedicated animal products laboratory facility; however with the expected completion by October 2011 of the new NAHC laboratory building funded by World Bank there should be laboratory space available in 2012 ready to equip.

[163] Trained APQAC staff can act as trainers for provincial staff on expected standards, surveillance activities and sampling procedures where appropriate. Training can also be provided to meat processing workers in the private sector on good hygiene practices.

3. Food Safety

64. Despite its importance as a major public good, the conditions surrounding food safety control and the promotion of good practices in food safety management are presently very poor in Lao PDR, and they are much weaker than in most other GMS countries. There are few regulations governing public or private sector behavior in food safety, hardly any programs and budgets for the design and implementation of public services to address food safety concerns, and extensive deficiencies in human resources in both public and private sectors for food safety management.[164] There is little basic information at the national capital level (and even less at Province and District level) about the safety of food, the safety of handling food by establishments serving the public, and about food poisoning outbreaks.

65. International estimates (by WHO) indicate that the time lost to illness and disease is relatively high in Lao PDR compared to more developed neighboring countries.[165] Detailed information on exactly what causes this situation is largely absent, but there can be little doubt that food hazards contribute to national diarrheal diseases incidence and to overall morbidity (and in a few cases to mortality). Consumers' health and wellbeing is clearly affected by adulterated, spoiled, contaminated, and sub-standard food products. Substantial economic and financial costs are incurred, as individuals lose work time and income because of illness, and they have to pay for medical treatment.[166]

66. The most basic constituents of a food safety system are: (i) the collection of information on the safety of food and incidence of food borne diseases - through active and passive surveillance and inspection; (ii) response to health hazards; and, (iii) preventive measures - such as adoption of GHP, GMP and HACCP - and the control of agricultural inputs such as pesticides, veterinary drugs and growth enhancers. At present, there is no monitoring and surveillance of the safety of food in Lao PDR; only about 600 samples are tested annually, largely for regulatory purposes, and about 60% of these are drinking water.[167] In addition, only very limited numbers of rapid test kits are used by public health offices and by the Department of Agriculture. There is no database for storage of information on the food situation in the country, and hence active participation in food safety alert systems is not possible. Within MAF, DOLF has no capacity for surveillance and inspection of the safety of food of animal origin, of animal feed and of veterinary drugs, and has no capacity for the surveillance of the safety of agrochemicals.

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164 Examples of food safety hazards include: (i) Sudan red additives (illegal colorants); (ii) Melamine in food; (iii) residuals of forbidden antibiotics (nitrofuran, chloramphenicol) and growth enhancers (glenbuterol) mycotoxins in nuts, corn and dried fruits; (iv) microbial, heavy metal and pesticide contamination; and, (v) unauthorized presence of preservatives, additives and supplements (or in excess of legal limits).

165 The Disability-Adjusted Life Year (DALY) rate indicates the number of healthy life years lost per 100,000 days because of mortality and morbidity caused by various diseases and other debilitating factors. [See http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/) The Global Burden of Diseases (2004 update), Table 4. Estimated DALYs per 100,000 population, shows that Lao PDR has 1,442 DALY per 100,000 days compared to 449 for Thailand, 315 for Viet Nam and 28 for Japan. http://www.who.int/healthinfo/global_burden_disease/gbddeathdalycountryestimates2004.xls

166 There are attempts made to value potential economic impacts from food safety improvements, typically by capturing the costs of temporary illness (usually the number of days lost multiplied by average earnings, and sometimes including medical costs) and decreased morbidity by human capital (usually measured by Value of a Statistical Life – VSL, based on lifetime average earnings for the particular economy, or sometimes willingness to pay estimates) valuations. Such approaches are methodologically fraught with difficulty regarding the application of discount rates, assumptions about future earnings, and reliability of any WTP estimates, but are sometimes used in DMC contexts. A recent ADB staff estimate in the SME ASR (2011) of the possible cost to Lao PDR of food safety related illnesses was of the order of $149 million annually, for example.

167 During the '450 years of Vientiane' celebrations and the SEA Games in 2009, additionally some 335 and 300 food and water samples were taken respectively.

67. There is little basic information at the national level (and even less at Province and District level) about the safety of food, the safety of handling food by establishments serving the public, and about food poisoning outbreaks. By Prime Ministerial notification[168] the only agencies allowed to operate at Lao PDR's national borders are Immigration, Customs and Quarantine; food safety inspectors are now only allowed on the national border in cases of emergency. This means that regular controls of imported food have to be carried out together with the control of food in the domestic markets; since such programs do not exist within the country there is *de facto* as little control of traded imported food products as of domestic food products.

68. In practice, prevention against food safety hazards is still virtually absent; this poses serious risks, the scale of which may be understood when it is realized that there are over 1200 registered (and thus relatively formal) food enterprises that should apply GHP and GMP, but there is presently no enforcement at all by public agencies.

69. Table 2, below, summarizes known food enterprises in Lao PDR, by the type of operation/product, and by their location. No information at all is available about the food safety practices of the much larger number of unregistered (family) food processors.

Table 2. Food Enterprise Statistics: Vientiane Capital, LuangPrabang and Champassak

Product / Location	Vientiane Capital	LuangPrabang	Champassak
Drinking water	152	28	39
Ice cube station	136	136	N/A
Ice	5	60	N/A
Beer	2		1
Bakery	N/A	5	N/A
Soft drinks/fruit juice	1	1	2
Food salers	N/A	N/A	241
Minimarkets	103	N/A	
Noodles, meatballs, rice noodles	138	10	N/A
Food processing	N/A	N/A	226
Total	**537**	**240**	**509**

Source: Food and Drug Department, MOH

70. As was described at the sector level, the public management of food safety is essentially a shared responsibility of MOH and MAF;[169] MOH is responsible for processed products, food processing, markets, and catering and restaurants, while MAF is responsible for primary and semi-processed products. Within MOH, DFD is responsible for food control and GHP and GMP in registered food processing enterprises, while the investigation of food poisoning outbreaks and food safety handling in markets, hotels and restaurants and unregistered food processing (family) enterprises is the responsibility of the Department of Hygiene and Prevention (DHP). There are laboratories under each of these Departments. Food control is mainly carried out by the Food and Drug Quality Control Center (FDQCC) - which is under DFD. This laboratory has received support from UNIDO for ISO/IEC17025 accreditation for five microbiology parameters (this is expected to be obtained in 2011). The National Center for Laboratory and Epidemiology (NCLE) is responsible for the investigation of food poisoning of individual cases and of specific outbreaks.

[168] Notification No. 405/GS (Prime Minister's Office/Government Secretariat), dated March 14, 2007.

[169] Other agencies have roles as well; National Science and Technology has responsibilities for standards and conformity assessment, and the Ministry of Industry and Commerce has responsibilities for food processing industries.

71. As regards the human resources situation, most of the staff in DFD have academic backgrounds in pharmacy and medicine, and there are virtually no staff with specific training in food science. Work in DFD is mainly focused on drugs, and in DHP the focus is mainly on water quality, sanitation, hygiene testing and latrines. Throughout the country there are about 400 hygiene inspectors working in provinces and districts. They nearly all have a high diploma in hygiene from the University of Health Services. They have no overall work program and no training in food safety; hence, virtually no activities in food safety are routinely conducted. Only during major events (such as the 2009 SEA Games and the celebrations of '450 years of the Vientiane Capital') do they undertake food control activities in markets and restaurants.

72. There is a particular and increasingly significant issue with food safety in the tourist industry. Lao PDR has a rapidly growing tourist sector; there were more than 2 million arrivals in 2009, for example (compared with more than double this number in 2005). There are now[170] over 3000 restaurants, hotels, resorts and entertainment establishments in the country, and by 2020 it is estimated that direct employment in tourism will be around 40,000 persons with a further 250,000 directly or indirectly involved.[171] Typically like other SMEs in Lao PDR, most hotels/guesthouses and restaurants are quite informal in operation – the proportion of low-budget, independent travelers in the country is relatively large. However, unlike neighboring Thailand and China, there are no official guidelines for, and no inspection capacity for, food handling in restaurants and hotels in the tourist industry. This absence constitutes a significant element in difficulties in overcoming the 'quality of service' challenges that many businesses must confront if they are to remain profitable in the longer term. The 'quality of service' challenge remains in Lao PDR, because of deficiencies in staff training, HR and career planning, staff retention, etc. Overall, an important reputational and economic risk exists for both Lao PDR and the wider GMS – particularly in the event of major disease outbreaks occurring, but also in the broader sense of regional tourism product marketing and consumer perceptions.

73. Food poisoning cases in tourism establishments are certainly underreported, and public investigations into particular food safety events are very limited in number.[172] More positively, it is generally agreed that incentives for promoting safe food handling within Lao PDR are strongest for those enterprises operating in clusters of hotels, restaurants and food suppliers/processors that depend on tourism.[173] To demonstrate this point and establish the case that the tourism sector provides a point of entry for the promotion of national food safety more generally, larger-scale, enterprises in the tourist industry have in fact already asked MOH for advice on safe food handling, and have indicated a willingness to pay for such services. However, at present MOH lacks the human resource and budgetary capacity for an adequate response (in the absence of specific training of staff for doing audits on GHP and GMP-based scorecards) and for providing advice to enterprises on upgrading facilities and handling. Public and donor support for promoting food safety in hotels, restaurants and the domestic food processors has so far been very limited.

74. In terms of international support for food safety concerns generally, FAO and WHO have helped with putting together some very broad guidelines for hotels and restaurants,

[170] National Tourism Administration survey (2009)

[171] Tourism Employment And Education in Lao PDR; Lao National Tourism Administration (2009)

[172] One recent (2010) food poisoning event concerned a Korean restaurant in Vientiane Capital, and two others have been at government food outlets.

[173] MAF has not yet been able to develop a GAP for Lao PDR. But, even when it has done so the capacity and financial problems of introducing it are more serious than those faced by MOH in introducing GHP and GMP in food enterprises, restaurants and hotels, because of generally week incentives. Only in the very tiny segments of the sector that are selling in high-end (exports) markets is GAP implemented by enterprises through contract farming, following requirements by buyers.

markets, and street food handlers.[174] These are not widely available at present. Some training has been received on food safety risk analysis from FAO and the Trade Development Facility (TDF) of World Bank. However, implementation has to date been very slow – partly because of a lack of human resource skills and also a lack of basic information. There is no systematic gathering and evaluation of data on food safety hazards that can be used for formulating policies, for awareness raising, and to develop food safety inspection programs. A risk-based approach for inspection (in line with WTO principles and Codex recommendations) is lacking. Although support has been received from: (i) FAO/NZAID for preparing a food policy and for work on GHP and GMP; (ii) from UNIDO and FAO for strengthening the FDQCC food laboratory; and, (iii) from FAO and WHO on an *ad hoc* basis for managing risks during major public events, no support has been received for food safety practice implementation. The TDF provides support for improving food legislation and generic expertise in risk evaluation, but it does not include systematic gathering of data needed for implementation of risk-based food controls.

75. In these food safety SPS subsector circumstances, the broad **investment opportunities** are: (i) to help with the design, establishment, and implementation of national food safety surveillance and inspection programs; and, (ii) to promote improved food safety handling in the tourist industry specifically. In addition, work to handle first time market access requests and to improve import risk handling of food products is justified.

76. More specifically, strengthening the design and implementation of annual programs of food safety surveillance, monitoring, inspection, and response to hazards is needed, with programs being based on known and perceived risks about food safety hazards in particular products, locations, markets, major public events, hotels and restaurants (especially in the tourist sector), and enterprises. The focus should be on both imported and domestic products, with emphases on food testing and for selective upgrading of testing facilities. For reasons of cost-effectiveness, priority should be given to the use of rapid test kits. Initially the focus should be on a limited number of priority food safety parameters, and additional parameters can be added later as needed. Cooperation and exchange of information with neighboring countries through bilateral working groups, and through participation in: (i) WHO's INFOSAN; and, (ii) the ASEAN rapid alert system for food and feed (ARASFF) is highly desirable. Awareness raising, education, and improved capacity for rapid intervention in case of outbreaks are needed, as is selective upgrading of technical regulations. Scholarships are needed to address the shortage of staff with professional education in food safety. Extensive training is also needed to address imbalances in education and skills within inspectorates. 'Training of trainers' methods could be followed, with associated support provided for operational costs.

77. Improved food safety handling in the tourist industry and related parts of the associated food industry is necessary, and should be pursued through promoting GHP and GMP, via the design of suitable (i.e., locally appropriate) systems for (sector-specific) grading of food establishments based on GHP and GMP parameters. Information and experiences on the development and application of such systems can be collected from China, Singapore, and from Thailand - where audit systems are used for diagnosing food safety handling procedures. Support is needed to: (i) develop a system of upgrading safe food handling; (ii) raise food safety awareness raising in the tourist industry; (iii) conduct training courses for private sector and government staff and inspectors; (iv) provide diagnostic assessments (i.e., pre-audits) of restaurants and hotels and related selected food enterprises; (iv) providing advice to enterprises for food safety handling upgrading; and, (v) audit enterprises against the scorecard for providing grades.

[174] These cover areas such as (i) toilet management and hygiene sanitation; (ii) hotel and guesthouse hygiene; (iii) food safety for permanent and mobile services, and (iv) hygiene of marketplaces.

74. Lastly, there is the desirability of a study on the possibilities for Lao PDR (in the framework of harmonization and cooperation among GMS countries) to use assessments by other GMS countries for first-time market access requests for processed food products. Similar country-specific studies could then be conducted in Cambodia and Viet Nam (and possibly also in China and Thailand), followed by regional consultations aimed at adopting a cooperative system for sharing information about first time access assessments. Support could subsequently be given to the possible implementation of such a system in in Lao PDR.

4. Academic Education

75. In order for Lao PDR to comply with international SPS requirements, to compete in increasingly demanding export markets, to conduct SPS market access negotiations, and to participate in international SPS fora, the country needs specialists in surveillance, risk analysis, testing, diagnostics, pest identification, standards, conformity assessment, GAP, GHP, and quality assurance management (such as HACCP). There are serious shortfalls in the national human resource base for these functions that currently constrain national SPS performance.[175]

76. This problem is particularly acute in Lao PDR because of the specialist nature of SPS services and of technical knowledge (mostly originating from requirement of the multilateral trading system and international trade), and the requirement for continuing and stable institutional arrangements that this implies. The present lack of a national cadre of local SPS employees in well-functioning institutions with good knowledge networks and with links to international institutions and expertise is an obvious and increasingly binding constraint to Lao PDR's SPS performance.

77. The current problem cannot be solved by simply recruiting more specialists, firstly because Lao PDR has very limited numbers of people for performing functions in plant protection, animal health and food safety, and (secondly) because individuals working in these areas themselves have insufficient formal education. Staff presently performing roles in extension, veterinary service, inspection services, and in laboratories under MAF typically have a diploma in general agronomy and animal husbandry, with very little knowledge of animal and plant health issues. Hardly any people in the private sector and government have an education in food safety (including food technology, GHP and GMP). Those staff presently working in inspection services - and also in government laboratories (e.g., for food safety) -typically have backgrounds in medicine and pharmacy.

78. Specifically in relation to animal health, of the 60 graduate veterinary positions employed within the public livestock and fisheries services at national and provincial level, only 26 are actually occupied by graduate veterinarians. Many of these will retire within 10 years, and no new recruitments have been made since 2000.[176] Of staff in veterinary technical positions only a few have the required formal education (most have a diploma in agriculture). Lao PDR does not have private veterinarians; private veterinary practice is usually undertaken by publicly employed veterinarians, veterinary technicians, and by the several thousand Village Veterinary Workers (VVW)[177] that do not formally belong to the veterinary services. (These VVW are mostly farmers and shopkeepers, although they do perform specific duties regarding OIE-listed diseases).

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[175] This shortage exists in part because of the small size of the country, but also because of recent political history and level of economic development, plus the novelty of WTO SPS requirements.

[176] Most people with higher levels of formal training in disciplines relevant for SPS received scholarships for education in the former Soviet Union and Eastern Europe, and many are close to retirement now. After the break-up of the communist system, this source of higher education dried up, and as alternative sources were limited there is now an age pyramid (with concentration in higher age groups)

[177] About 8000 have been trained by various projects, but since there is no clear institutional oversight it is not known precisely how many are still performing roles in animal health.

79. A recent estimate in the OIE PVS is that in the next 10–15 years training of 10 veterinary surgeons annually is imperative, and at least 20 graduates of the veterinary technician level are needed. (See Box 1, over). In addition, there is a strong need to provide training to the VVW.

80. Some gaps in SPS education, especially at the higher levels, can be solved by scholarships from abroad, but the availability of these is very limited for plant protection, veterinary science and food science. (A particular constraint is that the academic qualifications of Lao PDR graduates are generally too low to pass admission examinations for foreign scholarships, and also that obtaining necessary high scores in English proficiency requires for many people full-time study away from their academic disciplines). Veterinary education in the country should focus on veterinary technicians at superior diploma and Bachelor's level, with higher education for veterinary surgeons being achieved through training via scholarships abroad.

81. Obviously, Lao PDR universities have to fill most of the gaps in national human resources, especially for the lower and medium level professionals. While they are making efforts to serve these demands, Lao PDR universities across the board face serious capacity constraints in the forms of: (i) inadequate curricula; (ii) sufficiently qualified teachers; and, (iii) teaching facilities, in specialist areas of plant and animal health and food safety. Clearly-targeted support for upgrading education capacity at university level in these areas could make a difference to SPS performance in the short and medium-terms.

82. The main institution in Lao PDR for SPS-related education is the Faculty of Agriculture at the National University of Laos (FA-NUOL). FA-NUOL educates students at a higher diploma level, Bachelor's level, and (for sustainable resource management) at a Master's level. An 'Aspects of Food Safety' course is also taught at the University of Health Sciences (UHS).

Box 1. ***Findings from the OIE-supported PVS on training needs for veterinary surgeons and veterinary technicians in Lao PDR***

Estimates indicate that the training of 10 new veterinary surgeons per year would be imperative to ensure a stable renewal of professional staff in 10 to 15 years time, while providing opportunities for veterinarians to establish themselves as private operators and assume responsibility for the delivery of veterinary services and drugs to farmers. Ideally, by then, one would expect to find a trimmed-down public veterinary authority with around 50 veterinarians, and a thriving private veterinary sector with around 150 private veterinarians operating in-country.

Similarly, there are now strong incentives to establish a separate veterinary technician training course (of H.D. of B.Sc. level) at the National Agricultural Faculty in Nabong, where at least 20 students should enrol each year to ensure a core professional body of 400 veterinary technicians in 20 years time. A dedicated study programme focused on animal health of farm animals, as well as animal and fishery products, and their processed derivates, should be sufficient to cover the needs of the public sector and would be welcomed by the commercial animal and fishfarming sector too.

Such development would ideally be (technically) supported through twinning agreements with foreign (experienced) veterinary training schools or hospitals (as they are sometimes called) and could be financially supported by the donor community, given the relative short timeline and commitments expected (e.g. for scholarship grants). The Nabong Faculty is already being supported by the French Government, thus providing a sound basis for further negotiations into additional funding (by other donors too) for veterinary training.

The training of village veterinary workers will remain necessary for years to come, but it is advisable to streamline and centralise their training (through coordination of training projects and institutions) and to review their position within a novel national development strategy for farmers' training, communication, consultation and joint programmes with the veterinary services. Given the constraints to effective supervision by the genuine veterinary services (public, and maybe private

soon), these VVWs should indeed be considered as farmers' representatives at field level, rather than as representatives of the veterinary services at field level. Ideally, they should foremost be farmers themselves and be accredited to perform basic, and well-delineated veterinary activities, on behalf of these farmers (or major commercial farms), not on behalf of the veterinary services.
Their role can thus consist in managing drugs or vaccines that are accessible to the farmers or the livestock production companies for which they work, in compliance with (future) legislation on veterinary pharmaceuticals and biologicals. They should be entrusted by farmers to disseminate disease information from and towards the farmers they represent, but should not be held accountable for disease information as part of the veterinary services.
Source:*PVS Evaluation – 2007 Lao People's Democratic Republic* 19/06/2007. p. 14-15 Draft report

83. FA-NUOL is comprised of three departments: (i) Plant Science; (ii) Livestock And Fishery; and, (iii) Rural Economics And Food Technology. There are currently 57 academic staff (of whom 14 are women), including 9 PhDs and some 27 Masters' graduates – of whom 14 on study leave (In other words, about 20% of the staff are studying for further qualifications at any point in time). FA-NUOL plays a role in upgrading skills of staff in ministries (especially MAF), and undertakes modest advisory/consulting functions.

84. The Faculty delivers around 200 graduates a year; crop science and livestock are the larger departments in these terms, with food safety accounting for about 10% of students at present. The total number of students is 1,100-1,500 students any one time (about 30% are female), and about 10% of students are following bridging courses.[178] Most FA-NUOL graduates are employed in government service (over two-thirds), while about a quarter work on development projects, and the remainder (less than 10%) work for the private sector; only about 7% fail to get a job – mostly because they become housewives).[179] Livestock graduates overwhelmingly work for government; as before, there are no private vets in Lao PDR and the large private agribusinesses (mostly Thai, Chinese or Vietnamese-owned) employ graduates from their own countries. (Thailand's CP employs its own vets from Thailand on secondment to Lao PDR, for example). Graduates tend to enter employment quickly – with only around 10% taking nearly a year to get a job, mainly because they target donor/development projects (where salaries are higher than government).

85. FA-NUOL has laboratories (mainly constructed with Soviet assistance, and thus now about 35 years old) for chemical analysis, soil analysis, plant pathology, seed technology, animal feed analysis, food microbiology, food biochemistry, food processing, and various demonstration farms, agroforestry plots, insect production sites, and fishponds. However, it has only very basic and somewhat cramped classroom/laboratory demonstration and teaching equipment, which limits the delivery of a good curriculum (in animal health education especially). There are logistical problems in getting staff, students, and even visiting speakers from MAF and other central agencies, to and from classes at the Nabong campus (which is about 30 km outside Vientiane Capital) – and also for providing veterinary staff with access to animals off-campus - because current vehicles are very old.

86. Overall however, the biggest problem is regarding human resources capacity. There is some cooperation with the University of Khon Kaen, Thailand in curriculum development and in annual training of a few staff members (e.g., for Master's degrees, using Thai as the medium of instruction). *Agence Française de Développement* (AFD) has supported some 'training of trainers' (which is regarded as successful), and some staff of MAF participate in teaching on an *ad hoc* and 'as requested' basis, but major human resource deficiencies remain. As an example, education in food safety is based on Food Technology Education,

[178] There are two other universities with a Faculty of Agriculture – i.e., the universities of Luang Prabang and Champassack - but these only teach at Diploma level.

[179] Figures are based on alumni survey of 2005-2006. Private agribusinesses (mostly Thai, Chinese or Vietnamese-owned) employ graduates from their own countries. Thailand's CP employs its own vets from Thailand on secondment to Lao PDR, for example.

but it lacks a solid input from medical science. As another example, while NUOL generally is able to share the technical content of its curricula with other universities in the country, there is a complete lack of staff to undertake training for other institutions outside of Vientiane Capital. There is already access to government-arranged overseas scholarships, but the timeliness and specificity of training is often limited in relation to current SPS requirements.[180]

87. There is cooperation between FA-NUOL and UHS with MAF and MOH in training, teaching and use of laboratory facilities. In addition to possible upgrading in NUOL and Ministry services, there is scope for intensifying this cooperation and expanding it in the areas of surveillance, testing, diagnostics and applied research.

88. In these kinds of academic education SPS subsector circumstances, the main **investment opportunities** are to strengthen academic education by improving the quality of teaching at FA-NUOL (and UHS) through developing better curricula, by improving the quality of teachers, and by upgrading laboratory and teaching facilities.

89. The upgrading of the curricula should be selective and focused mainly on: (i) plant pests and diseases in GMS (i.e., their impact, taxonomy and identification, epidemiology and pathways of their spread, plant pest and disease control, pesticides, inspection, and the international framework for plant protection - WTO, IPPC), (ii) animal diseases in Lao PDR and GMS (likewise, their impact, zoonoses and safety of animal products, diagnosis, epidemiology, treatment and containment, safety of feed, veterinary drugs, inspection, and the international framework for animal disease control - WTO, OIE); and, (iii) food safety in GMS (i.e., food technology, food safety hazards, food borne diseases, food safety testing and assurance, prevention of food hazards, supply-chain control, inspection, and international frameworks for food safety management - WTO, Codex Alimentarius).

90. In addition to academic curricula development, there is a need for vocational (i.e., non-academic) training courses: (i) for staff in government and the private sector; and, (ii) to involve university staff and students in applied research, surveillance, testing and diagnostics. Promotion of the increased use of specialists from MAF and MOH in relevant parts of university teaching and applied research should be encouraged for both degree and any vocational courses.

91. Improving the quality of teaching staff should focus on: (i) filling gaps in specialties presently available to the faculty; (ii) improving the command of English language (to better access competitive scholarships); and, (iii) some advanced training in specialist short courses and at MSc and PhD levels. Twinning can be pursued as a tool in upgrading staff quality; for FA-NUOL this will involve widening the institutional context beyond the University of Khon Kaen in Thailand, to include relationships with other GMS universities and with suitable overseas institutions within Asia.

92. Upgrading of teaching facilities should include the construction of a purpose-built shared core teaching facility including: (i) a microbiology laboratory; (ii) teaching laboratory; (iii) greenhouse; and, (iv) staff room. (Including a separate autopsy room for veterinary training.) Modest refurbishment of Department-specific laboratories can be complemented by respective subject specific equipment upgrades (including key texts) to support more specialist teaching in the three departments.

[180] Reliance on Khon Kaen and other Thai institutions for some training has the advantage of proximity and relative cost-efficiency, but encourages students (who later become senior staff) to continue to work in a non-English language environment.