GREATER MEKONG SUBREGION
CORE AGRICULTURE SUPPORT PROGRAM

ADB Project Document

Roadmap on the Prospects for GMS National Scaling and GMS Regional Coordination of Agrifood Traceability Schemes

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This report was written by Drew Behnke, Sam Heft-Neal, and Joachim Otte, and edited by David Roland-Holst, under the direction of Pavit Ramachandran.

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ASIAN DEVELOPMENT BANK

Asian Development Bank
6 ADB Avenue, Mandaluyong City
1550 Metro Manila, Philippines
www.adb.org

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ABBREVIATIONS

ADB – Asian Development Bank
ASEAN – Association of Southeast Asian Nations
CASP – Core Agriculture Support Program
CBTA – Cross-Border Transport Agreement
CDM – Clean Development Mechanism
EWEC – East-West Economic Corridor
FAO – Food and Agriculture Organization
FMD - Foot and Mouth Disease
GHG – greenhouse gas
GMS – Greater Mekong Sub-region
GMS-AINS – Greater Mekong Sub-region - Agriculture Information Network Service
ICT – information and communication technology
LITS – Livestock Identification and Traceability System
MDGs – Millennium Development Goals
NSEC – North – South Economic Corridor
PRC – People's Republic of China
SEC – Southern Economic Corridor
SMEs – small and medium-sized enterprises
SPS – sanitary and phytosanitary
WGA – Working Group on Agriculture

I. Executive Summary

1. This report provides an overview of opportunities and challenges presented by the prospect of expanding agrifood traceability systems in the Greater Mekong Subregion (GMS). Based on the successful Livestock Information Traceability System (LITS) in the second phase of its Common Agricultural Support Program (CASP2), we review evidence below to support consideration of a national upscaling and regional coordination of traceability for livestock and other agrifood products. In addition to detailed discussion of institutional precedence and technology options, we offer several recommendations.

General Recommendations

1. As regional integration progresses, GMS countries are facing dramatically changing agrifood market opportunities. To capture these effectively will require determined policy support for market access and supply chain modernization.

2. Agrifood market expansion can be a potent catalyst for poverty reduction if policies support adoption of appropriate technologies and institutions. In the GMS, these include e-Traceability, certification, contracting, and producer cooperatives.

3. Expanding agrifood markets present new opportunities and risks for the region, as increasingly diverse biological products and economic agency complicate the food safety landscape. Managing food safety, disease, and other risks will require technological modernization, including e-Traceability to improve supply chain transparency and product quality accountability.

4. Partnership with private sector actors can accelerate and reduce the public costs of supply chain modernization. Technologies like e-Traceabilty enhance private value and adoption/diffusion of these innovations can be self-financing if governments take a leadership role in establishing and administering standards.

5. Regional government partnership for harmonized standards and adoption is essential to the credibility and effectiveness of supply chain technologies. Many of the potential benefits (e.g. product safety) of e-Traceability cannot be sustained without transboundary coordination.

6. Global trade partners, especially in the larger and more advanced economies, have strong incentives to support GMS agrifood modernization, and the sub-regional governments and their private sector agents should take full advantage of this to promote joint ventures, technology transfer, and export market access.

7. This project demonstrates that modest initial public investments can be leveraged by low-cost use technologies to significantly improve supply chain performance and participation. GMS governments and their development partners should follow this example of innovation leadership and continue making targeted investments to overcome information-base market access barriers.

8. The internet database platform developed for the LITS pilot project demonstrates its potential for universal information access. This presents opportunities for market transparency, but it also raises policy issues that should be addressed regarding privacy.

9. The successful implementation and positive reception of the LITS cattle pilots indicates that they should be expanded to national programs, not only in the three countries studied, but across the GMS.

10. Based on global experience with a wide array of other traceable agrifood products, the LITS results also indicate that e-Traceability should be expanded to pilots for other animals including fish, fruits and vegetables, timber products, and many other live and processed agrifood products.

Specific Steps for a Traceability Program Build-out

1. Initiate partnerships with existing allied official institutions and programs (health, trade, taxation, ag extension)
2. Establish official regional dialog on standards and information sharing (including a secretariat, working parties on standards, implementation, and technical issues, and private supporting organization)
3. Sponsorship for public sector capacity development and technology transfer
4. Dedicated extension support programs for farmers, processors, distributors, vendors
5. Deploy the LITS prototype (cattle) to all GMS countries
6. Scale up LITS nationally and use as a prototype for establishing transboundary standards and implementation

7. Begin parallel development (pilots) for other product platforms

II. Introduction

2. Traceability of agrifood products confers many benefits on supply chain participants, including reduced risks to public and animal health, improved information and logistical efficiency, and generally higher values for comparable products. Fundamentally, traceability works by overcoming information barriers that undermine incentives to secure product quality and realize commensurate value for those who invest in this quality. This approach is at least as old as the French wine classification scheme, where it still performs all these functions. In the intervening centuries, however, traceability has been applied across a myriad of products and markets, with widely varying degrees of sophistication and effectiveness.

3. The global agrifood economy has accelerated rapidly in the last generation, with trade rising over 400% since 1990. This market expansion, with increasingly complex supply chain linkages, has made the advantages of traceability more apparent and desirable to consumers, producers, private intermediaries, and governments. Functionally, traceability is designed to secure a "holy trinity" of agrifood product characteristics: health safety, quality, and authenticity. This can take many forms, from avian flu to fair trade to halal certification, but in all cases these systems are designed to facilitate trusted agency and the investments supported by it, even as supply chains span hundreds of intermediate exchange, production, and logistical events across a global economy.

4. As the following definitions from three leading international agencies indicate there is general agreement about the objectives of agrifood traceability:

- the "ability to trace the history, application or location of an entity by means of recorded identifications". - The International Standards Organization (ISO 8402[2])
- "the ability to trace and follow a food, feed, food-producing animals or substance intended to be, or expected to be, incorporated into a food or feed, through all stages of production, processing and distribution." - EU General Food Law (Regulation [EC] No. 178/2002)
- "the ability to follow the movement of a food through specified stage(s) of production, processing and distribution". - Codex Alimentarius Commission

5. This unanimity should make it easier for individual countries to adopt standards that are recognized by trade partner countries and international supply chain participants. Because such harmonization can increase value at all stages of production, processing, and marketing, it provides incentives for efficient coordination and can be self-financed in the long term. The essential first step, however, is for governments and development

partners to commit to transparent and enforceable standards that make the system credible.

6. As we shall see in this review, effective traceability schemes have been devised and implemented in both advanced and developing economies, across a diverse array of products and with many different technologies. The ADB's own Livestock Information Traceability System (LITS) has recently demonstrated how such a scheme can be implemented in the Greater Mekong Sub-region. In three sample countries, LITS showed that cattle and buffalo can be tagged and tracked in their progress from farm to abattoir, using low cost technologies that provide detailed real-time location data directly to an internet database. This proof of concept exercise shows that agrifood product information can be dramatically improved in a cost-effective and incentive compatible manner, with the prospect of increasing agricultural and agrifood supply chain investment and income across the region, from low income farm households to the largest agribusiness ventures.

7. In this report, we examine the prospects for expanding LITS, nationally for cattle and other agricultural products, and regionally to each GMS member country with a harmonized system that effectively supports transboundary trade bilaterally and onward to global markets. The step from a single species and isolated case studies is a very big one in terms of opportunity, but the technologies already tested are robust and general. We also have precedence around the world for the institutional requirements to deliver effective traceability, so optimism regarding LITS expansion is justified. In the following sections, we covert main dimensions of a roadmap for such a build-out. Successful extension to leading agrifood products would certainly make a major contribution to realizing the vast agrifood potential of the GMS region, substantially reducing poverty and inequality in the bargain.

8. The next section reviews global precedence for traceability systems. This is followed by a review of existing GMS national standards for food product and supply chain safety. To assess the international support for this initiative, another section reviews existing development initiatives in the GMS related to agrifood traceability and related objectives. The final section summarizes a provisional strategic plan for the LITS build-out.

III. Institutional Precedence and Technology Options

A. Traceability Schemes and the Global Economy

9. The global landscape of traceability for livestock and livestock products is extremely variegated. Generally speaking, more advanced economies usually have more advanced traceability schemes, yet are are some very prominent exceptions. Cattle and beef products are one of the highest value international food products. Table 1 provides a summary of ID systems in major cattle and beef trading countries as of June 2011. While most major exporters have developed mandatory national cattle identification, traceability to ranch of origin, animal movement tracking, and cattle age verification systems, the United States has not. The established trend, however, favors increased coverage, with six of the world's eight largest exporters having adopted mandatory cattle animal identification and traceability systems.

Table 1: Cattle Traceability in Major Exporting and Importing Countries

Country	Launch Date	Mandatory	National Individual Animal ID	Trace to Ranch Origin	Animal Movement Tracking	Animal Age Verification	Motivation
Major Exporters							
Brazil	2002	For export animals, unclear for rest	Yes	Yes	Yes	Yes	Control FMD and Market access to EU
Australia	1999 mandate 2005	Yes	Yes	Yes	Yes	Tag Issue Date	Market access, food safety, animal disease
United States	2013	Cattle crossing state lines only	No	No	No	No	Control diseases for animals crossing states
New Zealand	2006	Yes begin in 2011	Yes	Yes	Yes to begin in 2012	Yes	Market access and animal health (TB)
Canada	2002	Yes	Yes	Yes	Yes to begin 2011	Voluntary	Market access accelerated with BSE
Argentina	2007	Yes for young animals	Yes	Yes	Yes	Yes	Control FMD and market access
Uruguay	2006 mandatory	Yes	Yes	Yes	Yes	Yes	Control FMD and market access
Selected Major Importers							
Japan	2003	Yes	Yes	Yes	Yes	Yes	Response to BSE discovery to restore consumer confidence
European Union	1997 current law 2000	Yes	Yes	Yes	Yes	Yes	Animal health and BSE response
Mexico	2003	No	Yes	Yes	Yes	Yes	Animal health, census, traceability
South Korea	2004 updated 2009	Yes	Yes	Yes	Yes	Yes	Consumer food safety assurance and animal health

10. Although technological advancement is correlated with adoption, the expressed and apparent motivation for launching and building upon animal ID and traceability programs appears to be a combination of economic and public health incentives. Policy documents frequently reference objectives for animal health management, export market access, food safety assurance, and producer profitability. Timing of many adoptions suggests they were reactive, ex post responses to outbreaks and their consequences, including

stock losses, market quarantines, and expressed concerns about contagion to other species including humans.

11. Import controls are similarly reactive (Table 2), and vary sharply across trading partners in ways that suggest the retaliatory nature of some food safety standards. Of particular interest in these results is the way patterns of SPS protection respond to outbreak history. In particular, most of these restrictions surfaced following the BSE discovery in the United States cattle herd in late 2003. In contrast, Australia and New Zealand face no restrictions on beef exports to important US export customers. Brazil and Argentina face some restrictions because of FMD, but also have no restrictions related to animal age verification.

Table 2: Cattle Market Standards by Exporter and Importer

	OIE	OIE	Dominant	Import Country Sanitary and Phytosanitary Restrictions on Beef Imports								
Export Country	BSE Status	FMD Status	Cattle Finishing	Japan	China	South Korea	Taiwan	Hong Kong	Europe (EU-27)	Russia	Canada	Mexico
US	Controlled	Free	Grain	<21 mo, EV Required	Restricted	<30 mo, EV Required	<30 mo, EV Required,	<30 mo, EV Required, Traceable to farm of origin	NHTC Required	<30 mo, EV Required	No Restrictions	< 30 mo, EV Required
Canada	Controlled	Free	Grain	Age verfication CCIA	Boneless, <30 mo, full traceability	<30 mo	<30 mo	No Restrictions	< 30 mo, NHTC Required	<30 mo, or boneless 30 mo +		<30 mo
Australia	Negligble	Free	Grass	No Restrictions	No Restrictions	No Restrictions	No Restrictions	No Restrictions	No Restrictions	No Restrictions	No Restrictions	No Restrictions
New Zealand	Negligble	Free	Grass	No Restrictions	No Restrictions	No Restrictions	No Restrictions	No Restrictions	No Restrictions	No Restrictions	No Restrictions	No Restrictions
Brazil	Contolled	Mixed / Vaccinate	Grass	FMD Restrictions	No Restrictions	Restricted	Restricted	No Restrictions	Inspection, Traceability	No Restrictions	FMD Restrictions	FMD Restrictions
Argentina	Negligble	Mixed / Vaccinate	Grass	FMD Restrictions	Restricted	Restricted	Restricted	No Restrictions	Inspection, Traceability	No Restrictions	FMD Restrictions	Restricted

Sources:
USDA, FSIS, Export Requirements for Meat and Poultry Products
Canadian Food Inspection Agency, Special Requirements by Export Markets, Index of Export Markets. Available at:
USDA, FAS, Global Agricultural Trade System Online
Global Trade Atlas, data provided by Erin Daley, USMEF.

12. This complex mosaic of largely ad hoc policies is far from the kind of coherent system of calibrated safety standards and harmonized technologies that is envisioned by architects of modern agrifood traceability schemes. As such, it may actually be undermining the efficiency and ultimate value of international agrifood supply chains, while creating incentives to profit from market discrimination, misrepresentation, and rent seeking.

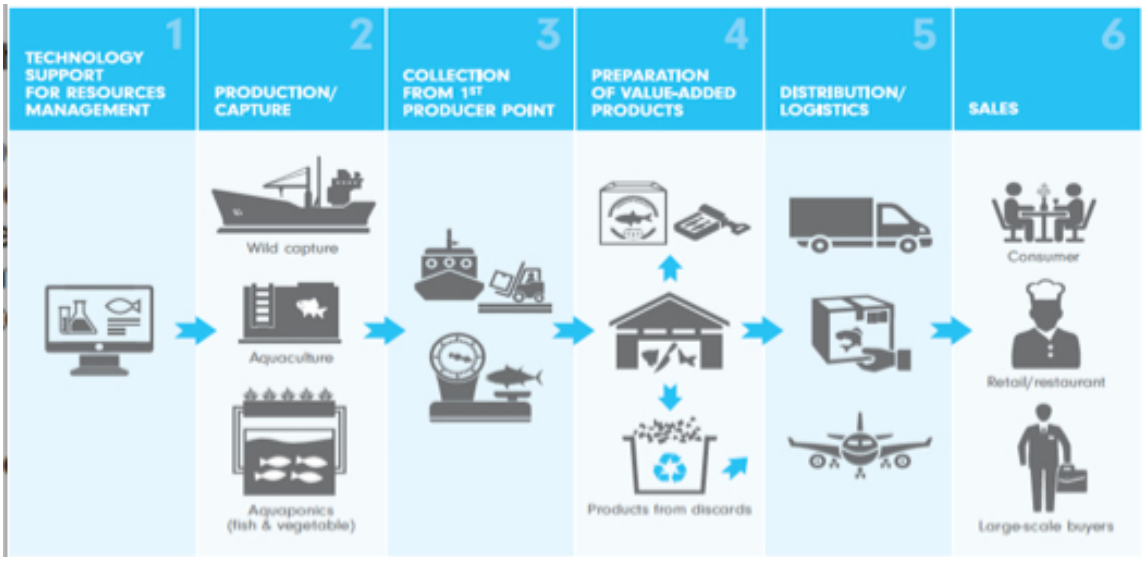
13. Fortunately, the precedence established by these reactive policies has produced solid evidence regarding the benefits of introducing traceability before it is made essential by a health crisis. A long as it is inclusive and credible, a traceability system confers the three principal improvements on agrifood value chains: health safety, product quality, and authenticity. With these ultimately comes a product value premium that reinforces a virtuous cycle of investments in and attention to maintenance of product quality. Although traceability schemes can be compulsory or voluntary, sufficient quality

premia can allow for self-financing of voluntary schemes, particularly important in low and middle income countries where public funds are scarce.

B. Traceability System Scale and Scope

14. The LITS pilot was small in scale (several hundred animals) because is was intended for proof of concept. LITS also represented a relatively narrow scope approach to agrifood traceability, following live animals only as far as the door of the abattoir. Again, this was sufficient to prove the technology, but a fully articulated scheme would go from "farm to fork", following animal or other agricultural products from farm production, through processing and distribution all the way to retain customers. As Figure 1 makes clear, such a system would have to cover a range of very diverse actors who might be in very different places.

Figure 1: Schematic Supply Chain - Fishery

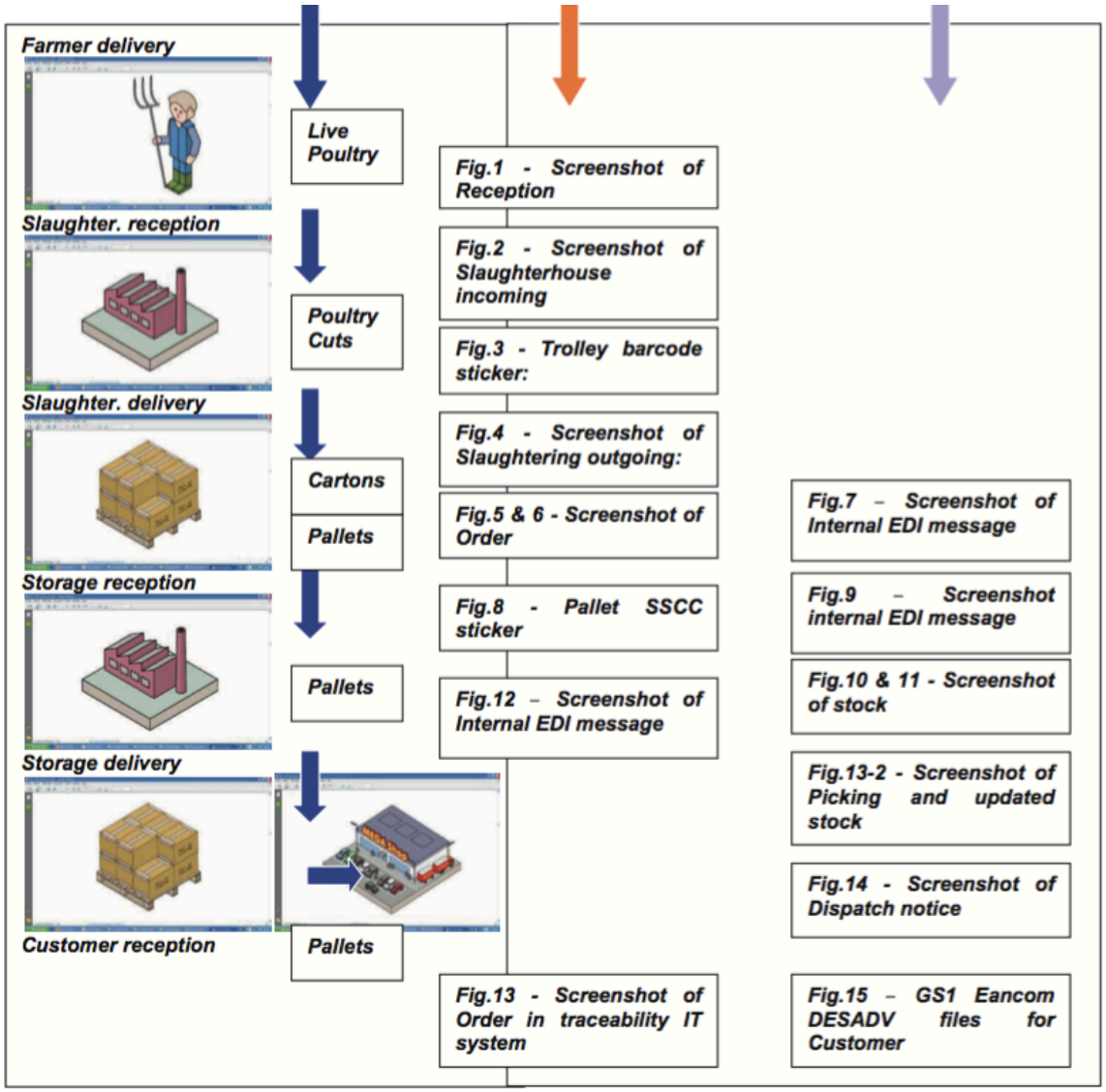


15. Likewise, a traceability scheme would have to place surveillance a different node for every actor and process, while at the same time integrating all the information collected along this supply chain. As Figure 2 suggest, for a single product type (in this case poultry) this involves very complex design, management, and coordination problems.

16. While this ideal may not be within reach of GMS economies in the immediate future, beginning with a building of live animal monitoring is an essential first step for several reasons. Firstly, live animals represent the most important reservoir of disease risk, both to other animals and to humans. Moreover, interactions of live animals are inherently more difficult to regulate, as they are very dispersed spatially, often free to move and interact with other organisms and the environment on their own volition, and generally in

lowest hygienic conditions of their passage through the agrifood supply chain. All these risk characteristics make it essential to begin traceability at the farm level, and this is further reinforced by incentives for value creation. It is at the farm where the most important decisions are made or implemented regarding product quality. Processing can ameliorate quality problems in raw agrifood products, but it is much better to manage quality from the outset of the production process, sharing the value incentives with primary producers. For all these reasons we believe that LITS is the appropriate starting point for national and regional traceability systems.

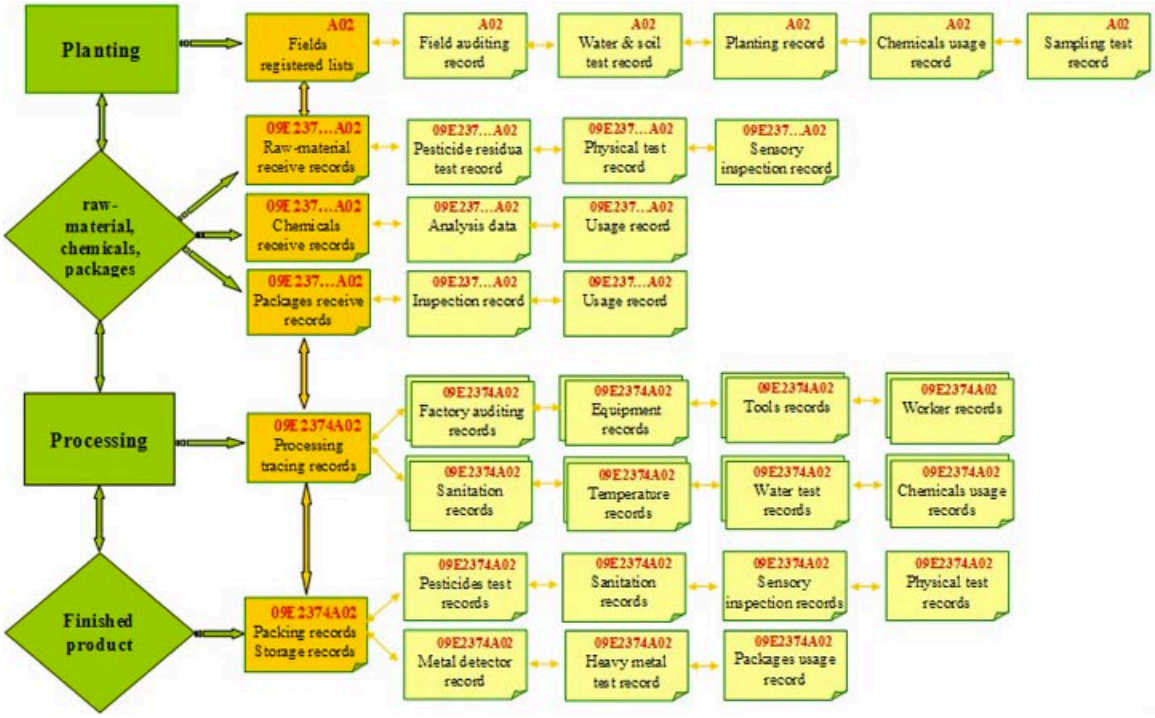
Figure 2: Full Supply Chain Traceability - Poultry



C. Technology Options

17. The most basic traceability technology is marking raw agrifood products, a practice at least as old as branding animals. The modern day equivalent of branding is the ear tag used in the LITS pilot. Instead of simply burning a single owner's logo into the skin of the animal, however, the LITS tags digital identifiers (unique to each animal) anchor the animal to an internet database that can record it's entire life history, including detailed animal identification, chain of custody across the entire agrifood supply, and details of the animals passage through time and space. Despite the complexity of the information capacity in such a system, the user interface requires on smartphone literacy.

Figure 3: Schematic for an Advanced Vegetable Traceability System



18. Advanced traceability systems tend to evolve incrementally, in response to higher standards for product identification and safety standards at all stages of the supply chain. Figure 3 shows a generic example from the vegetable sector, where identification, auditing, and testing activities are integrated across all stages from primary production to marketing.

19. Other attributes of traceability, including detailed identification and health status, and other product quality assessment, can require much more complex technologies. These include advanced forensic, investigative and regulatory laboratory tools; e.g.

- Stable isotope measurements (IRMS, WSCRDS)
- Spectroscopic techniques (FT-MIR, NIR, FT-NIR, Raman, UV-VIS etc.)

- Chromatographic techniques (GC, LC)
- MS techniques (LC-MSMS, DART-TOF)
- DNA-PCR
- Chemometrics

20. These tools can be essential in more critical quality and authenticity systems, but like the issues of scope and scale, technological complexity should be appropriate to needs and institutional capacity, developing incrementally in unison. For this reason, we recommend that national scaling of traceability in the GMS begin with LITS-style tagging technology. This incremental approach can establish a robust prototype, especially for institutional capacity and coordination, that can be expanded as market requirements dictate.

D. Conclusions

21. Our review of international traceability schemes reveals a diverse historical landscape of national initiatives, characterized by relatively defensive and ad hoc policies developed in reaction to external food safety threats or sanctions from prominent trading partners. Although this history reveals the value of traceability as a risk management tool, it is far from the proactive vision of cooperative supply chain development that motivates modern traceability initiatives. ADB's own LITS initiative seeks to established a multilateral framework of harmonized standards that can capture the three main virtues of traceability for the GMS region: enhanced food safety, higher product quality, and higher values for agrifood production, processing, and distribution.

22. For this initiative to succeed, it should be voluntary and self-financing, in recognition of the value creation intrinsic to an inclusive and credible traceability system. Because the GMS region is dominated numerically by smallholder producers and low income enterprise supply chain participants, such a scheme must be technologically appropriate in terms of simplicity and cost. The LITS pilot, based on low cost tagging, digital storage, and mobile phone platforms, sets and example for this that must be followed by successor programs. Otherwise, the potential of traceability for self-directed poverty alleviation will not be fulfilled.

23. Depending on the sophistication of system requirements for identification and monitoring, very advanced technologies are available for supply chain forensic assessment. To be successfully scaled-up, however, new GMS agrifood traceability program should be based on a simple prototype, using simple digital tagging of a single species or species cluster (like LITS). This approach recognizes the importance of institution building and transboundary harmonization as preconditions for building a more diverse, inclusive food monitoring program.

24. In closing, it is worth reiterating a few core constraints and potential benefits of an effective agrifood traceability system:

Constraints

- Traceability schemes must be technologically appropriate in terms of simplicity, accessability, and cost.
- Schemes must be credible to all market chain participants. Any perception of lowing standards or (worse) falsification will eliminate the primary driver of this technology's adoption and diffusion: higher product values.

Potential benefits

- Traceability directly influences production and logistical service decisions, which means, from a process point of view, that it also drives many material efficiency gains along supply chains.
- Traceability is also a matter of physical flow management, which means that a secondary economic benefits from improved dynamic knowledge and partner coordination.
- Traceability helps strengthen relationships with customers, due to improved information, accountability, and incentive-based product quality effects.
- Finally, properly designed traceability systems allow private incentives to partially or fully offset costly public surveillance, penalties, and direct assistance. For the GMS, a very important benefit will be market access for smallholders, a gateway to self-directed poverty reduction.

IV. Existing national standards in the GMS

25. The operation of safe food trade must be underpinned by appropriate legislation if it is to be successful. This process begins with well-designed national policies. National legislation or regulation is required to: (i) enforce standardization of identifiers so that they are unique and compatible with regional systems; (ii) require the identification of specified products or animals (for instance, all cattle and buffalo prior to movement from the place of birth, or defined sub-populations at defined times); (iii) prohibit the removal of identifiers, both those applied as part of the national program, and compatible tags/labels on imported products; and (iv) provide sanctions for failing to respect the above requirements. Legislation should also designate who is responsible for application of identifiers, registration of all or certain types of establishments, submission of data to the central database, and rules around access to and privacy of data in the database.

26. Each country in the GMS, to varying degrees, has its own legislation and institutional framework designed to improve food safety standards domestically and in trading relationships. Here we review existing standards in each country and examine challenges that each country is likely to face on its path to improved food safety.

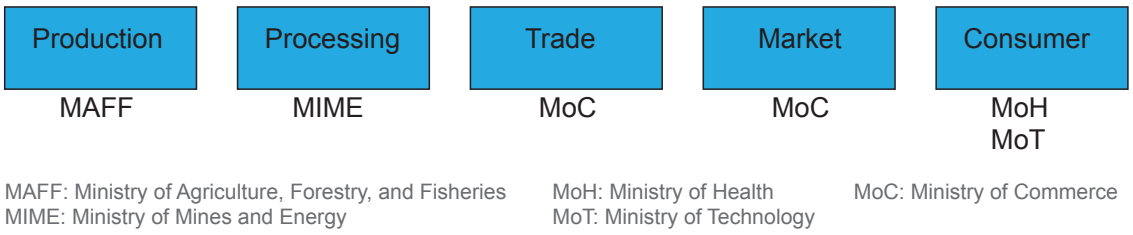
A. National Agrifood Standards

Cambodia

a) Institutional Framework

27. The Cambodia food safety management system revolves around an inter-ministerial agreement of food safety called Parkas IMP 868. This agreement is based on the food to table approach and was established in 2010 giving mandates to six ministries to oversee different stages of the food system (Ministry of Commerce Cambodia 2014a). The inter-ministerial committee coordinates activities across agencies and across stages of the food supply change. One of the goals is to harmonize Cambodian standards with international (Codex, IPPC, OIE) and regional (ASEAN) standards. As a result of this agreement, several laws have been passed in areas including management of quality and safety products and services (2000), food hygiene for human consumption (2003), fisheries (2006), and the management of pesticides and fertilizers (2012), among others (Ministry of Commerce Cambodia 2014b). While these regulations are primarily intended to address domestic supply chain, regulations related to Codex and harmonization of regional/international standards strongly affect the export sector.

Figure 4: Food Safety Responsibilities - Cambodia



Source: Author's diagram based on Ministry of Commerce Cambodia (2014)

Table 3: Food Safety Challenges and Mitigation Strategies in Cambodia

Food Safety Challenge	Goods associated with risk	Risk Mitigation Strategy
Pesticides and veterinary drug residues	Fresh fruits and vegetables, fish and meat products	Low enforcement and monitoring, GAP training, strengthening lab capacities
Mycotoxins	Cereal products	Post harvest management, strengthening lab capacities
Food additives, preservatives	Processed foods	Low enforcement and monitoring, GMP training, strengthening lab capacities
Heavy metals	Fish products, cereal, vegetables, ground water	Monitoring, risk communication
3-mcpd, benzopyrene, melamine	Soy sauce, oil, dairy products	Use of new technology in soy sauce production, strengthening import inspection
Salmonella	Meat products	GHP/GMP/HACCP
E Coli, staphylococcus	Meat products, water, fruits and vegetables	GHP/GMP/HACCP
Listeria monocytogenes	Fish products	GHP/GMP/HACCP
Vibrio cholera	Fish products	GHP/GMP/HACCP

Source: International Life Science Institute: Workshop and Roundtable Discussion on Food Safety and Standards (2014)

b) Challenges

28. While Cambodia has agreed to adopt Codex guidelines for its national standards, the plan for adoption is not clear (FAO/WHO 2010). Given the number of different agencies involved, coordination and cooperation between ministries is challenging. Other issues previously highlighted include lack of transparency, lack of consumer awareness, limited resources for implementation, and lack of regulation (International Life Science Institute

2014). While GHP, GMP, and HACCP standards are established for some foods, they are not mandatory for all foods.

A recent conference reviewing food safety challenges and mitigation strategies[1] argued that low enforcement of existing standards and suboptimal post harvest management are among the major food safety challenges remaining in Cambodia.

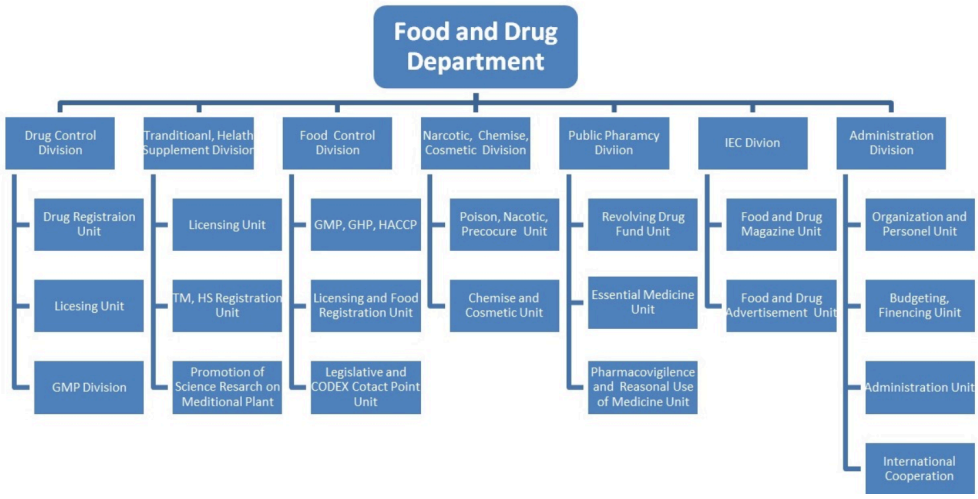
Lao PDR

c) Institutional Framework

29. Food production in Lao PDR is overseen at the farm level by the Ministry of Agriculture and Forestry (MAF) and more broadly by the Ministry of Health (MOH). MAF responsibilities include plant and animal health control, implementation of GAP, plant quarantine, registration of pesticides, veterinary medicines, and good husbandry practices (FDD Lao 2016). In addition, the MAF manages laboratory services. The primary food safety authority is the Food and Drug Department (FDD) within the MOH.

30. The FDD is organized into seven divisions, illustrated in the following figure:

Figure 5: Organizational Structure Food and Drug Department, Lao PDR



Source: FDD Lao PDR (2014)

[1] Workshop and Roundtable Discussion on Food Safety and Standards: March 5, 2014. Yangon, Myanmar

31. The FDD is the Codex contact organization for Lao (FAO/WHO 2010). It is responsible for, among other duties, premarketing approval registration, food testing, inspection of food businesses (food establishments, retailers, markets, border check points), managing import/export permits, food borne disease surveillance, and food safety emergency response. One area that the FDD does not oversee is safety regulations for restaurants and street vendors. Monitoring food safety at the restaurant/vendor level instead falls under the responsibility of the DHP (FDD Lao 2014).

32. Since 2000, a number of laws have been passed in Lao PDR aimed at improving food safety. These regulations address areas including drinking water regulation (2005), food labeling (2009), food safety policies (2009), food inspection and regulation (2012), and revising food laws (MoH 2014). Legislation also created two laboratories for food testing and microbiology analysis and chemical analysis.

Table 4: Food Safety Challenges and Mitigation Strategies in Lao PDR

Food Safety Challenge	Goods associated with risk	Risk Mitigation Strategy
Heavy metals	Drinking water	Monitoring
Aflatoxin, Ochlratoxin	Nuts, coffee	GMP, storage process control
Pesticides, herbicides	Fruits and vegetables	Registration, GAP
Food additives	Artificial preservatives and color	Monitoring, education
Prohibited FA, Betagonists, natural toxin, hormone, growth promoters	Seafood, meat	Regular inspection, destroy and punishment
Salmonella	Chicken	Education, good hygiene practice
E. Coli	Vegetables, water, street food	Good hygiene practice, education
Vibrio. Parahaemolityticus	Seafood	Food inspection, good cooking and storage practice
Staphylococus au.	Street food	Good hygiene practice
Ophistorchis	Fish	Consume cooked food

Source: International Life Science Institute: Workshop and Roundtable Discussion on Food Safety and Standards (2014)

d) Challenges

33. Despite progress made in addressing food safety in Lao PDR, a number of challenges remain. There are still only a limited number of official standards that have

been legislated. Moreover, capacity among official staff remains a constraint. This limits the effectiveness of inspections and lab testing. Gaps in the monitoring system also remain. For example, food imported across land borders is not approved by any food safety authority. Moreover, even where food safety authorizes are present, enforcement is often ineffective. A recent conference identified several food safety challenges along with possible solutions.

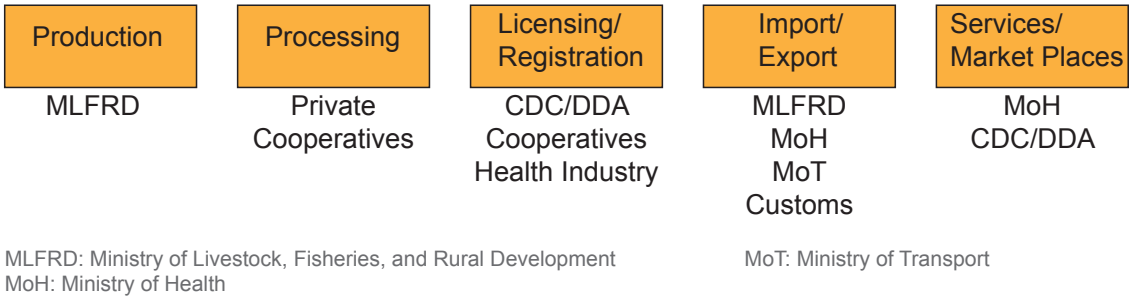
34. Most of the prescribed solutions involve improved inspection and monitoring capacity and improving these capacities will be among the primary challenges for Lao PDR moving forward.

Myanmar

e) Institutional Framework

35. The Food and Drug Board of Authority (MFDBA) and Food and Drug Supervisory Committee, formed under the Ministry of Health (MoH), oversee food safety in Myanmar. However, different agencies, both public and private, oversee food safety at different stages of the supply chain.

Figure 6: Food Safety Responsibilities - Myanmar



Source: Author's diagram based on FDA Myanmar (2014)

f) Challenges

36. One of the primary barriers to an improved food safety system in Myanmar is human resource development. Officials, inspectors, laboratories, and other agencies associated with monitoring and enforcing food safety standard do not always have the resources (both human and capital) to do their jobs effectively (International Life Science Institute 2014).

37. For example, Myanmar officially adopted Codex standards as national standards in 2005, however, these standards are not always enforced (FDA Myanmar 2014). Improving capacity and enforcing existing standards will be a challenge for Myanmar going forward. A recent conference identified several food safety challenges for Myanmar moving forward.

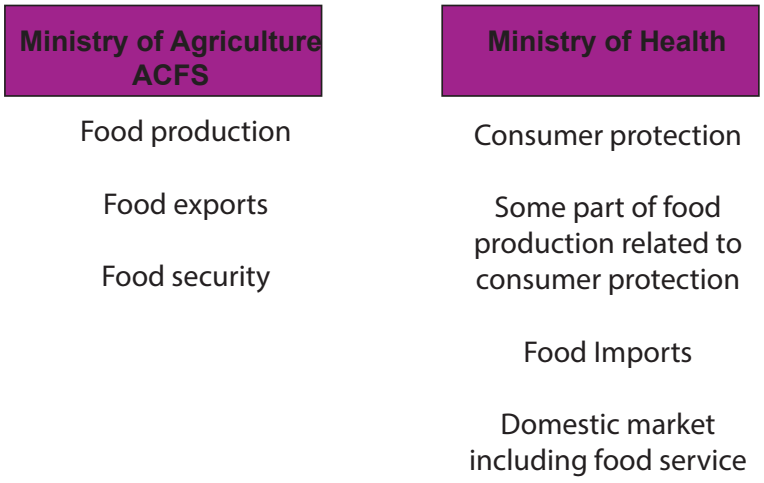
Table 5: Food Safety Challenges and Mitigation Strategies in Myanmar

Food Safety Challenge	Goods associated with risk	Risk Mitigation Strategy
E. Coli, fecal coliforms	Pulses and beans, vegetables	Monitor farm to table
Cholera	Fish products	HACCP, regulate animal feed and vet drugs
Salmonella	Poultry products	Regulate pesticide use
Staphylococcus aureus	Processed food and dairy products	Labeling and monitoring

Source: International Life Science Institute: Workshop and Roundtable Discussion on Food Safety and Standards (2014)

Thailand

Figure 7: Food Safety Responsibilities in Thailand



Source: Author's diagram based on ACFS (2011)

g) Institutional Framework

38. Monitoring food safety in Thailand is undertaken from both the supply perspective (producers) and the demand perspective (consumers). The two agencies primarily

Existing national standards in the GMS

responsible are the Ministry of Agriculture and Cooperatives (MOAC) and the Ministry of Health (MOH). Responsibilities are divided between the agencies according to production based and health based areas of food:

39. The MOAC agency responsible for setting food safety production standards in Thailand is the National Bureau of Agricultural Commodity and Food Safety Standards (ACFS). ACFS was founded in 2002 and its roles include[2]:

1. To set standards for primary agricultural, processed agricultural, and food products
2. To supervise, enforce, and monitor food safety program.
3. To permit certificate and accredit Certification Body
4. To coordinate and co-negotiate on non-tariff trade barrier issues as well as on international standardizations
5. To serve as a key information center for primary agricultural, processed agricultural and food products
6. To serve as a secretariat to the Board of National Agriculture Commodity and Food Standards
7. To serve in other capacities as requested by law or the cabinet, or the minister

40. ACFS is the national accreditation body for conformity assessment system of products. In addition, it is the national contact point under WTO-SPS/TBT agreements. In 2008, ACFS enacted The Agricultural Standards Act, which formed an Agricultural Standards Committee responsible for setting policies and providing recommendations to MOAC regarding food safety. The Agricultural Standards Act also resulted in regulations related to satisfying international standards including Codex.[3]

41. ACFS acts in accordance with ISO/IEC 17011:2004, which provides guidelines for accreditation bodies accrediting conformity assessment bodies. Currently, there are 8 accredited Certification Bodies (CB) in the scope of GMP/HACCP and GAP.[4] In addition to its roles overseeing food safety standards, ACFS also oversees rules and regulations for accreditation of laboratories related to agricultural commodities. ACFS uses the farm-to-table approach to improve food safety, which includes safety standards at each stage of the value chain.

[2] http://www.acfs.go.th/eng/responsibility.php
[3] List of these regulations can be found here: http://www.acfs.go.th/eng/regulations.php
[4] List of accredited CBs can be found here: http://www.acfs.go.th/cb.php

h) Challenges

42. Thailand has a history of strong food safety standards and in many ways serves as a model of safety standard enforcement. That being said, regulating food trade, particularly with bordering countries, is a challenge. Protecting safe food production standards requires extensive monitoring of imported products in order to ensure safe food produced domestically is not contaminated by imported food. Nowhere is this risk higher than in the livestock sector where live animals are traded across international borders with, in some cases, minimal inspection. One of the primary drivers of the illicit livestock trade in the region is the demand for meat from China. Anecdotal evidence from Chinese agencies suggests that cattle are smuggled from Myanmar into Thailand for the purpose of fattening before being transported through Lao PDR to China. The motivation of these movements is to gain access to low-cost high-quality feed that is available in central Thailand (Yunnan Animal Science and Veterinary Institute 2016).

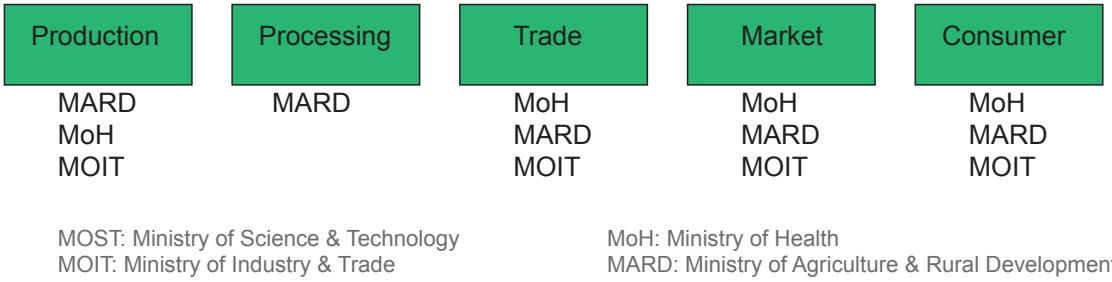
43. Thailand has great incentives to legalize and regulate international food trade with neighbors because of the strength of its export sector, which would be greatly impacted by disease outbreaks and other safety risks associated with unregulated trade. Therefore, a primary challenge for Thailand is to protect its high-value agrifood sector by working with regional governments to develop harmonized region-wide food safety standards that can be used to limit the risk of contamination from imported animals.

Viet Nam

i) Institutional Framework

44. Food safety monitoring is divided between several ministries in Viet Nam. The Ministry of Health (MoH), Ministry of Agriculture and Rural Development (MARD), Ministry of Industry and Trade (MOIT), and Ministry of Science and Technology (MOIST) all play roles in different facets of food safety management. The role of each ministry along the food production value chain is shown below (VFA 2014).

Figure 8: Food Safety Responsibilities – Viet Nam



Source: Author's diagram based on Vietnam Food Administration (2014)

45. The MoH is responsible for development of standards (including Codex), laboratory accreditation, and quality control of imported foods. In addition, it is also responsible for development of technical regulations and the annual listing of foods requiring inspection. The foods that the MoH is responsible for supervising include processed foods, food additives, natural water, and imported foods (International Life Science Institute 2014).

46. MARD is responsible for the safety of fresh foods and raw materials. Within MARD, different departments oversee different types of food production. The Department of Animal Health (DAH) oversees livestock while the Department of Plant Protection (DAP) oversees crops and the National Fishery Quality Assurance Department (NAFIQAD) oversees fisheries. MARD is responsible for monitoring crop production, import-export, use of pesticides, use of veterinary drugs, and domestic distribution of food products.

47. Certain facets of food processing and trade are controlled by MOIT. It is responsible for production and marketing of products including, but not limited to, milk, bottled water, vegetable oil, flour, and starches. MOIT is responsible for developing a food hygiene and safety control program for the food processing industry. It also monitors trade aspects of food, labeling of goods, and overall quality of food products (VFA 2014).

48. Science and technological activities related to food safety fall under MOST. Activities under MOST's management include standardization, measurement, quality control, and development of technological potential.

49. National food safety standards are therefore managed by a combination of ministries and coordination between ministries is essential to a fully functional food safety management program. In total there are more than 275 Vietnam National Standards (most based on Codex standards). About 50 technical regulations of food are overseen by MoH while about 30 are overseen by MARD.

j) Challenges

50. Despite the progress made, many challenges remain. While many of the official standards are strongly written, lack of coordination between ministries and limited capacity and experience among inspectors has limited the effectiveness of these standards (VFD 2014). For example, Viet Nam has experienced problems with veterinary medicine residues in meat and pesticide residues in fresh vegetables and fruits. During a recent regional conference in food safety challenges in the GMS, Vietnamese officials identified several challenges and possible risk mitigation strategies for pressing food standard issues in the country (International Life Science Institute 2014).

51.

Existing national standards in the GMS

Table 6: Food Safety Challenges and Mitigation Strategies in Viet Nam

Food Safety Challenge	Goods associated with risk	Risk Mitigation Strategy
Pb	Canned food, water	Monitor farm to table
Hg	Seafood	HACCP, regulate animal feed and vet drugs
Pesticides	Fruits and vegetables	Regulate pesticide use
Food additives	Beverages, processed snacks, noodles	Labeling and monitoring
Salmonella	Chicken and poultry products	GMP
E. Coli	Meat products	Cooking carefully
Listeria, monocytogenes	Dairy products, hot dogs, smoked seafood	Sanitary storage
Parasites	Meat products	Cooking carefully

Source: International Life Science Institute: Workshop and Roundtable Discussion on Food Safety and Standards (2014)

52. The next step for Viet Nam is to establish a harmonized government endorsed food regulatory system and to enforce the food safety standards that are already officially in place. The government plans to accomplish these goals by developing a unified legislative framework for food control management and establishing a communication system to support food inspection information (VFA 2014). These new initiatives will be implemented along with capacity building activities to improve education and training among inspectors and to develop greater laboratory and technical capacity. Viet Nam also plans to establish surveillance systems and mechanisms for transparent information between ministries that provide accurate and timely information for cross-ministry communication.

B. Current Livestock Traceability Systems in the GMS

53. Cross-border trade of live animals presents its own distinctive challenges that are important to address. The current situation with regards to individual identification for cattle and buffalo in the GMS is as follows: Cambodia, Vietnam and Myanmar have no formal organized system of identifying large ruminants. In Lao PDR, there have been a number of animal health programs that have used metal fold-over ('sheep-style') numbered ear tags. The number systems used have not guaranteed unique identification. Thailand is currently using an ear-tag with associated identification booklet for cattle identification and an online database. This system provides for a unique identifier related to the animals, as well as a province based identifier and a color-coded tag to indicate the place of origin of the animal with regard to FMD control zone.

54. The varying stages of development in each country's livestock traceability system make harmonizing animal trade standards challenging. The next section discusses some of the challenges associated with harmonizing standards across countries with respect to both animal trade and for broader issues of food safety.

C. Harmonizing Regional Standards

55. Harmonizing regional standards is important because there are significant potential gains associated with more efficient trade. In fact, according to one estimate, about one third of global trade goods are affected by standards and the additional trade from complete international harmonization of product standards would be equivalent to the reduction of tariffs by several percentage points (Buthe et al 2011). In other words, stricter and less harmonized requirements are more costly to comply with while agreed upon standards increase trade.

56. However, harmonization of standards does not always make sense. Sometimes standards have different purposes in different countries and harmonization changes the tenor of the standards in one or more of the adopting countries. Other times restrictive standards may be unattainable in certain production environments thereby pushing a certain subset of producers out of the value chain. Moreover, poorly designed standards can also hinder trade.

57. Despite these potential shortcomings, harmonization of food safety standards is essential to well functioning global trade in food products. Several initiatives are working on standard harmonization including the International Task Force on Harmonization and Equivalence in Organize Agriculture (ITF), the Joint Initiative on Corporate Accountability and Workers' Rights (JO-IN), and the ISEAL Alliance, among others (ITC 2011). Many of these initiatives aim to increase legitimacy of private standards (also an important role of national governments) and enhance the effectiveness of their impacts.

Existing national standards in the GMS

58. Some progress has already been made on this front. Most countries in the GMS have incorporated Codex Codes of Practice into national regulations directly or adapted them to the national setting. These types of public-private partnerships are important for increasing the speed of harmonization (see Section VI for more on the role of PPPs in setting and enforcing food standards).

59. Membership in international organizations also plays a role in standard harmonization. For example, membership in the WTO requires implementation of SPS prior to exporting to other WTO countries. Moreover, exported food from WTO members must conform to GAP, GMP, and HACCP standards. These types of regulations encourage adoption of standards. ASEAN has also developed several initiatives to promote food standards among its members. The ASEAN Expert Group on Food Safety (AEGFS), ASEAN Task Force on Codex (ATFC), and ASEAN Food Safety Improvement Plan (AFSIP) all promote harmonized standards among its members.

D. GMS Product Certification Schemes

60. To conclude this section, we provide a compendium of GMS product certification schemes and links to more information on each scheme.

General Certification Bodies

- GlobalGAP (Good Agriculture Production) Certification (http://www.globalgap.org/uk_en/for-producers/aquaculture/)

- VietGAP (National certification scheme corresponding to international (GlobalGAP) benchmark: crops, livestock, seafood (http://www.vietgap.com/)

- WFTO-Asia World Fair Trade Organization
    - FLOCERT - global Fair trade certification body (http://www.flocert.net/verification-services/)

Aquaculture
- Global Aquaculture Alliance (http://gaalliance.org/ and http://bap.gaalliance.org/)
    - BAP certification (Best Aquaculture Practices)
    - Thailand 112 BAP-certified facilitates
    - Vietnam 135 BAP-certified facilities
- Aquaculture Stewardship Council (http://www.asc-aqua.org/index.cfm?act=tekst.item&iid=365&lng=1)
    - Vietnam: >61 certified farms (pangasius, shrimp, tilapia)

Fisheries
- Marine Stewardship Council - certified sustainable seafood
    - https://www.msc.org/get-certified/fisheries
    - http://wwf.panda.org/what_we_do/footprint/smart_fishing/how_we_do_this/sustainable_markets__new/credible_fisheries_certification_/
    - Vietnam 1 certified fishery

Timber
- Pan-ASEAN Timber Certification Initiative (http://www.aseanforest-chm.org/forest-and-timber-certification/)
- http://www.profor.info/sites/profor.info/files/docs/WorkingPaper-Mekong-Vol1-final.pdf
- Forest Stewardship Council (FSC) (certification system)
    - Laos (http://www.fsc.be/nl-be/fsc-at-work-inhoud/laos)

V. Related Development Partnerships

61. As mentioned in earlier sections of this report, the two key drivers for enhanced traceability are concerns over (i) sanitary / food safety aspects of animals, plants and derived products, and (ii) over conditions of production, such as 'organic', 'free-range', 'halal', 'sustainable', 'fair trade', geographic provenance, etc., i.e. so called credence attributes.

62. In both cases, traceability is a prerequisite for certification systems, which greatly enhance the value of traceability. For farm animals, animal identification, either at individual or at group level, forms the basis of animal identification systems, which is "the inclusion and linking of components such as, establishments/owners, the person(s) responsible for the animal(s), movements and other records with animal identification." The objective of an animal identification system is to uniquely identify individual animals or groups so that information about that animal or group can be documented and verified. Without the associated information, animal identification does not contribute to disease control or trade facilitation.

63. In GMS countries, as elsewhere, a range of certification schemes have developed over time, in the case of livestock often preceding the development of an effective national animal identification system. Most donor-supported development and implementation of traceability systems is embedded in broader initiatives aimed at improving agriculture sustainability and / or rural livelihoods, in which traceability is a prerequisite for 'certification' of credence attributes.

64. This Section provides an overview of (i) intergovernmental and international agencies developing and promoting standards for LITS, (ii) agencies conducting pilot trials in LITS (beyond Southeast Asia), (iii) describes selected projects / initiatives as examples of the implementation of traceability systems in Southeast Asia (beyond LITS) to illustrate approaches and potential benefits, and (iv) draws general lessons for smallholder inclusion in traceable / certified value chains.

A. Intergovernmental and international agencies developing and promoting standards for LITS

UN-CEFACT

65. Within the United Nations, the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) is the focal point for the development of trade facilitation recommendations and standards for electronic business. UN/CEFACT standards are developed by international expects from Governments and the private sector. Many large standard setting organizations participate in the work of UN/CEFACT,

inter alia WCO, IATA, FIATA GS1 and IMO. UN/CEFACT standards development is coordinated through a high level Memorandum of Understanding among the “big four” standard setting organizations ISO, ITU, IEC and UNECE.

66. The UN/CEFACT standard for *Traceability of Animals and Fish* is being developed by the agriculture expert group within UN/CEFACT. The main partners in the development of this standard are international experts from France, Canada, the Netherlands, EU and GS1 who work for the public and private sector. These experts are connected on the national level with relevant business partners in this field like Animal Registration Offices, Farm Service Providers, transporters, traders, slaughterhouses and meat processors.

67. The objective of the project on animal and fish traceability is to standardize the processes of data registration and exchange relating to all events involved in trade in individual animals, groups of animals and animal products to provide traceability of the agriculture supply chain both for regulatory and commercial purposes.

68. The UN/CEFACT traceability standard is based on ISO/IEC 19987 which itself is based on the GS1 Electronic Product Code Information Service (EPCIS) standard. This standard is widely used in international trade and in the retail industry and low cost implementation solutions are available.

UN-FAO (Food and Agriculture Organization)

69. The Food and Agriculture Organization of the United Nations (FAO) is an agency of the United Nations that leads international efforts to eradicate hunger. It helps developing countries and countries in transition to modernize and improve agriculture, forestry and fisheries practices and ensure good nutrition for all. FAO acts as a neutral forum where nations meet as equals to negotiate agreements and debate policy. FAO is also source of knowledge and information dissemination as well as for knowledge generation and application in the field.

70. Within its normative remit FAO has a number of specialist Intergovernmental Committees (Committee on Fisheries - COFI, Committee on Aquaculture - CAQ, Committee on Forests - COFO, Committee on Agriculture - COAG) as well as commodity-specific Intergovernmental Groups (IGGs, e.g. IGG Tea, Oilseeds, Meat and Dairy), which, among other issues, have reviewed, and continue to review, various aspects of traceability and certification and provide guidance to participating governments.

71. In 1998, FAO developed the first guidelines on animal recording for medium-input production environments. More recently, FAO, in collaboration with the ICAR task force for developing countries, has produced decision-support guidelines for setting up

sustainable animal identification and recording systems. These guidelines promote an integrated approach to animal identification and traceability (and performance recording) that involves all relevant stakeholders in a country.

72. Furthermore, FAO has supported a number of countries in the preparation of legislation related to animal identification and traceability and in the design and implementation of national LITS.

UN-FAO/WHO Codex Alimentarius Commission

73. In the early 1960s, the Food and Agriculture Organization (FAO) of the United Nations and the World Health Organization (WHO) recognized the importance of developing international standards for the purposes of protecting public health and minimizing disruption of international food trade. The Joint FAO/WHO Food Standards Program was established, and the Codex Alimentarius Commission was designated to administer the program.

74. The Codex Alimentarius is a collection of international food safety standards that have been adopted by the Codex Alimentarius Commission (the “Codex”). The Codex is based in Rome and funded jointly by the FAO and the WHO.

75. Over the years, the Codex has developed over 200 standards covering processed, semi-processed or unprocessed foods intended for sale for the consumer or for intermediate processing; over 40 hygienic and technological codes of practice; evaluated over 1,000 food additives and 54 veterinary drugs. Importantly, the SPS Agreement cites Codex's food safety standards, guidelines and recommendations for facilitating international trade and protecting public health.

76. The Codex has a number of committees and task forces one being the *Committee on Food Import and Export Inspection and Certification Systems*. One of the remits of this Committee is to develop principles and guidelines for food import and export inspection and certification systems with a view to harmonizing methods and procedures which protect the health of consumers, ensure fair trading practices and facilitate international trade in foodstuffs. In 2006, the Committee produced the *Principles for Traceability/Product Tracing as a Tool within a Food Inspection and Certification System*.

77. The definition of traceability in CODEX stems from the 27th session in July 2004, where traceability adopted and added into the Procedural Manual of the Codex Alimentarius Commission (CAC). Several Codex Standards encompass key elements of traceability and these are adopted by most national governments in their own legislation. It is also a reference in case of dispute among trade partners. The CODEX CAC.GL 60-2006 or the Principles for traceability/product tracing as a tool within a food inspection

and certification system develops a set of principles to assist competent authorities in recognizing traceability/product tracing as a tool within their food inspection and certification system.

The World Organization for Animal Health (OIE)

78. The OIE is the intergovernmental organization responsible for improving animal health worldwide. In 2014 OIE had a total of 180 Member Countries.

79. The OIE is the WTO reference organization for standards relating to animal health and zoonoses. The OIE publishes 2 codes (Terrestrial and Aquatic) and 2 manuals (Terrestrial and Aquatic) as the principal reference for WTO members. The codes traditionally addressed animal health and zoonoses, but they have, in recent years, expanded to cover animal welfare, animal production food safety, consistent with the expanded mandate of the OIE which is 'to improve animal health worldwide'.

80. OIE helps its Member Countries and Territories to implement animal identification and traceability systems in order to improve the effectiveness of their policies and activities relating to disease prevention and control, animal production food safety, and certification of exports.

81. Chapter 4.1 of the Terrestrial Animal Health Code (TAHC) addresses the General Principles on Identification and Traceability of Live Animals while Chapter 4.2 is devoted to the Design and Implementation of Identification Systems to Achieve Traceability.

82. The OIE Terrestrial Animal Health Code emphasizes that traceability should be a demonstration of Government Veterinary Services' capacity to exercise control over all animal health matters, and not a description of the responsibility of private stakeholders in the chain. The national competent authority is responsible for the control of traceability systems. It states that "The Veterinary Services should be able to demonstrate that they have the capacity, supported by appropriate legislation, to exercise control over all animal health matters. These controls should include, where appropriate, compulsory notification of prescribed animal diseases, inspection, movement controls through systems which provide adequate traceability, registration of facilities, quarantine of infected premises/areas, testing, treatment, destruction of infected animals or contaminated materials, controls over the use of veterinary medicines,…" etc.

83. The OIE regularly updates its international standards as new scientific information comes to light, following established procedures. The only pathway for adoption of a standard is via approval of the World Assembly of Delegates meeting in May each year at the OIE General Assembly.

ICAR

84. The International Committee for Animal Recording (ICAR) is an International Non-Governmental Organization (INGO) which was formed on March 9th, 1951, in Rome. The original scope was to harmonize milk recording methods, calculation procedures and formulation of results. Since then ICAR has gone on to be "The" international guideline reference for animal identification, recording systems, data analysis and genetic evaluation.

85. ICAR is composed of 117 Members from 59 countries. Its Members are involved in different areas of the animal production sector ranging from breed associations to herd management organizations, milk and genetic laboratories, industry service providers, public research centers and competent authorities.

86. ICAR certifies ear tags, RFIDs, milk meters and genetic laboratories. For the animal identification sector, being the ISO Registrant Authority, ICAR certifies RFID devices in conformance with ISO11784 and ISO11785 and ICAR standard for composition and environmental performance of external RFID devices.

B. Agencies piloting / assessing LITS at field level

87. A number of recent research activities in South East Asia demonstrate increasing recognition in the importance of understanding and better managing animal movements. However, as currently no country in the GMS has a comprehensive national LITS in place, these studies have tried to utilize existing animal movement recording systems (such as movement permits and checkpoints) as well as conducted extensive consultations with traders and other involved in the livestock trade. In order to overcome these shortcomings, a number of agencies have piloted / are piloting LITS in various countries and various species.

UN-FAO

88. Within its 'Field Program' FAO has piloted various LITS and certification approaches in Southeast Asia covering a variety of farm animal species. These activities usually involve funding from FAO's Regular Program and are intend as 'proof of concept' for up-scaling if successful.

89. As part of its Pro-Poor HPAI Risk Reduction project, an FAO pilot program took a demand-driven approach in Vietnam, introducing a traceable labeling scheme that linked safe on-farm chicken production practices to consumer demand for guaranteed disease-free chicken meat. Using a certification scheme, the pilot program provided farmers with sufficient incentive to meet health standards in raising their poultry. As customers, concerned about quality and health, willingly paid a price premium of US$0.63 for

certified chickens, participating farmers were able to access higher value markets. Chicken bearing the program logo and guarantee of safety was sold in four markets outside Ha Noi. As a result of this success, wider donor interest was generated and the pilot program has been scaled up to national level with support from USAID and a private Vietnamese company.

90. Within the same project, a four-month longitudinal study was conducted to identify marketing practices associated with poultry traceability to evaluate the potential for implementing a tracing system for a poultry supply chain in northern Vietnam. Poultry sold in batches were traced between farms and markets, and their traceability was assessed upon market arrival. A total of 315 batches were released from the farms; 37% arrived at a market, from which 57.3% were 'traceable'. Traceability was associated with farms operating through no more than two traders and batches brought to the market on the day of purchase. No specific incentives were provided to farmers or traders. These results suggested that there was potential for implementing a poultry traceability scheme even in the absence of price premiums or other incentives for producers or traders.

91. Under to technical cooperation project (TCP) *Development of a Prototype Livestock Identification and Traceability System* FAO commissioned an assessment national LITS within the GMS and the development of a prototype regional LITS. The prototype LITS included (i) database design principles, (ii) database structure, and (iii) interface functions. A simulation of the system was conducted using regional animal population and movement data and the system was demonstrated in a workshop to GMS country delegates, which were asked to provide comments on the prototype. The project produced a report on *Requirements, Prospects and Challenges to Implementing an Animal Identification and Traceability System in the GMS*.

92. Currently FAO, in collaboration with The Thai Bureau of Biotechnology on Livestock Production (BBLP) is conducting a project entitled *Enhancement of Beef Productivity through Animal Identification and Traceability*. The project focuses on Thai-Black Beef Production (TBBP) and has initiated artificial insemination of native – bred cows with frozen semen of purebred Angus. Meat from such animals is of high quality and commands a high demand and price. The BBLP premise is that more farmers who go into TBBP would mean more farmers benefitting from the marketing of good quality meat thus increasing their incomes. However, animals from the TBBP scheme must have a reliable identification and traceability system as raising such animals requires utmost production standards.

93. The DLD has implemented national livestock identification and registration system (NLIRS) since 2006 using ear tagging. A major problem of the ear tag for cattle identification is that it is not a lasting marker that can trace the animals from being calves to fattening steers at slaughterhouse. In supermarkets, the barcode has been used widely for meat products however the barcode system could not provide information to

trace back the origin and breed of beef products. The BBLP has capacity to do DNA traceability although there are recommendations to use RFID technology or combine the use of both DNA traceability and RFID technology. The aim of the project is to assess the costs and benefits of using the RFID technology, the DNA traceability or both to ensure farm to fork traceability of TBBP.

International Livestock Research Institute

94. Within the remit of the broader Standard Methods and Procedures in Animal Health (SMP-AH) project (USAID-funded), ILRI is currently leading a pilot study on LITS in the IGAD region. Although not conducted in the GMS, this project is included in the review as its approach and findings contribute valuable LITS-specific information and lessons for other countries.

95. The IGAD countries are experimenting with different LITs based on their unique requirements, challenges and specific production systems. Kenya, for example, is experimenting with the electronic radio frequency identification device (RFID) bolus, (which has a microchip implant), while Ethiopia and Sudan are using RFID tags.

96. The livestock identification and traceability pilot study by ILRI is designed to enable the traceability of identified animals from slaughter to source markets and/or kraals. The study is implemented within the framework of existing systems and addresses needs such a surveillance, food safety and public health. The study also collects and analyzes data on the efficiency, effectiveness and sustainability of the system. National governments will use the data to upscale and upgrade their current livestock identification and traceability system so that it also addresses surveillance and public health. AU-IBAR will use the data to design a harmonized livestock identification and traceability system for the IGAD region.

97. A LITS pilot study in Kenya revealed that an electronic livestock identification and traceability system was technically feasible in its pastoral areas. Rumen boluses were found to be better identifiers compared to ear button tags, having a readability of 100% and no losses over the one-year duration. The cost, when calculated for the nearly three million beef cattle in arid and semi-arid lands, was US$ 7.4/head for registration and US$ 7.3/head for annual maintenance. The ear button tags while exhibiting readability of 100% over the same duration had losses of nearly 6%, which fell short of The International Committee on Animal Recording (ICAR) recommendations of minimum values >98% readability. The cost per head for ear button tags was estimated at US$ 5.15 for registration and US$ 5.04 for annual maintenance.

98. The main challenges identified were limited competence of human resource, inadequate market support infrastructure and limited skills in the application of middle ware (equipment between the tag and computer such as reader and cables).

Furthermore, prior to the study, the country did not have a clear institutional and organizational framework under which electronic LITS could be implemented.

Institut de l'elevage (French Livestock Institute)

99. In collaboration with the Sino-French Center the French Livestock Institute implemented a pilot and demonstration identification and traceability information system for meat production in China. The project was applied in two enterprises of cattle fattening and slaughtering located near Beijing, chosen by the Chinese Ministry of Agriculture, named Beijing Jinweifuren Halal Food Co. and Kerchim (which is the second producer of meat in China).

100. The French Livestock Institute provided the technical assistance for the design and implementation of the pilot and demonstration information system for animal identification and traceability for the meat value chain comprising: (i) adaptation and implementation in the Chinese context of a French data collecting information system used by fattening centers and slaughtering houses linked with an eartag ordering database; (ii) design of a numbering, ear tags ordering system, supply chain, quality control, choice of the type of eartag; (iii) implementation of electronic identification and traceability of living animals in two fattening centers; (iv) technical assistance for the design of data collection, their analysis and reporting to small livestock farmers; and (v) training in France on the design and implementation of an information system for meat traceability.

C. Examples of projects / initiatives that promote inclusive certification and traceability in agricultural value chains in Southeast Asia

101. The following provides a brief overview of selected projects / initiatives in Southeast Asia that aim to integrate smallholders in agriculture traceability and certification schemes and thereby promote market access and improve livelihoods. Although none of these deals with farm animals, they are presented to illustrate institutional issues and approaches, which can provide lessons for LITS development.

Sustainable shrimp farming in Vietnam's mangrove forests (SNV)

102. Shrimp aquaculture is the leading driver of deforestation in Vietnam's mangrove deltas, essential ecosystem and acting as critical carbon sinks. SNV and co-implementer IUCN have taken up this challenge with the Mangroves and Markets (MAM) project to integrate ecologically sound shrimp aquaculture with the mangrove environment of Cà Mau—reversing mangrove loss and reducing carbon emissions.

103. In alliance with shrimp importers, traders, and over 5,000 farmers, MAM provides training on breeding and marketing ecologically-certified shrimp (requiring traceability in the supply chain), supports replanting and management of the mangrove forest, and mobilize access for shrimp farmers to certified carbon markets and carbon financing.

104. Traditional shrimp farms do not have the high yields of intensive aquaculture, so access to stable and profitable markets is important for their long-term sustainability. Organic certification offers access to better export markets, providing shrimp farmers with a price premium and strengthening small-scale shrimp aquaculture. MAM selected global standard Naturland as the most suitable organic certification that requires mangrove conservation. Since the project's start in 2012, MAM has trained over 1,300 shrimp farmers in organic shrimp farming practices and mangrove restoration.

105. With organic shrimp certification in place, MAM guided farmers in negotiating a favorable purchase agreement with Minh Phu, the world's second-largest seafood processor by shrimp export value. The farmers can sell their shrimp at a 10-percent price premium with significant benefits. The net income from selected integrated mangrove-shrimp farming in 2013 has increased 1.5 times by comparison with traditional shrimp aquaculture or rice-shrimp without mangroves.

106. SNV has supported ongoing efforts by Vietnam's Ministry of Agriculture and Rural Development, the International Union for Conservation of Nature and Natural Resources (IUCN), and The Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) to introduce national policy that provides the legal basis for mangrove protection.

IDH Aquaculture Program

107. To increase the supply of responsibly farmed fish and create positive social and environmental impact, the IDH Aquaculture Program boosts demand and supports fish farmers in their transition towards more responsible practices.

108. IDH aims to accelerate the shift towards a responsible aquaculture sector by (i) committing retail and seafood buyers to responsible sourcing preferably through independent certification such as by the Aquaculture Stewardship Council (ASC); (ii) implementing scalable and cost-effective models for providing support that enable farmers to improve business performance, reduce impact on the environment, improve social responsibility and increase supply chain resilience, and (iii) convening coalitions of private and public sector stakeholders (like retail, trade, donors, CSO's), supporting the advancements of standards and strengthening the enabling environment for sustainable farming in the countries of production.

109. Currently, the Aquaculture Program is active in Vietnam, Indonesia, Thailand, India and China. In these countries, fish farmers of pangasius, tilapia and shrimp are supported in complying with the ASC standards for responsible aquaculture. Large, medium and smallholders and workers are supported through training in implementation of the ASC standard, better farming methods and improved traceability, capacity building in management and food safety procedures, access to responsible fish feed and other inputs, and environmental impact reports.

110. Furthermore, the Program engages in capacity building of certifiers and auditors, and in the development of communication, labeling and marketing strategy. It also convenes traders and retailers on sourcing ASC certified fish and helps organize the supply of certified farmed fish through producers support. Buyers' interest is fueled by their need for traceability and securing access to products for current and future demand, and their need for consumer trust in their brands.

Sustainable palm oil in Indonesia (Unilever, CPI & IDH)

111. In partnership with IDH and PTPN III, Unilever has initiated a program to support smallholder farmers in the Sei Mangkei area. Initially, in 2015 and 2016 this will focus on supporting 320 independent farmers to increase their productivity and become RSPO certified. By 2018, the program aims to work with partners through the landscape management pilot to scale up support for smallholder farmers in the broader Sei Mangkei landscape area to deliver larger scale environmental impacts and improved livelihoods.

112. To balance business, environmental and administrative aspects, the districts of *Simalungun, Serdang Bedagai, Asahan, Labuan Batu Utara & Batu Bara* have been chosen for the pilot. These districts contain more than 40% of North Sumatra's oil palm, with a high concentration of smallholder farmers. They also contain 25% of North Sumatra's peat soils and 10% of it's forests (more than 250,000 hectares), of which around one third are located outside the forest estate, and hence liable for conversion and offering a significant opportunity to test a landscape management approach.

113. Through the Traceability Working Group, IDH has been helping to convene private sector actors throughout the oil palm value chain to build common understanding of what traceability entails and develop methods for addressing the initial challenges to transparently delivering on traceability commitments.

The Oceans and Fisheries Partnership (USAID)

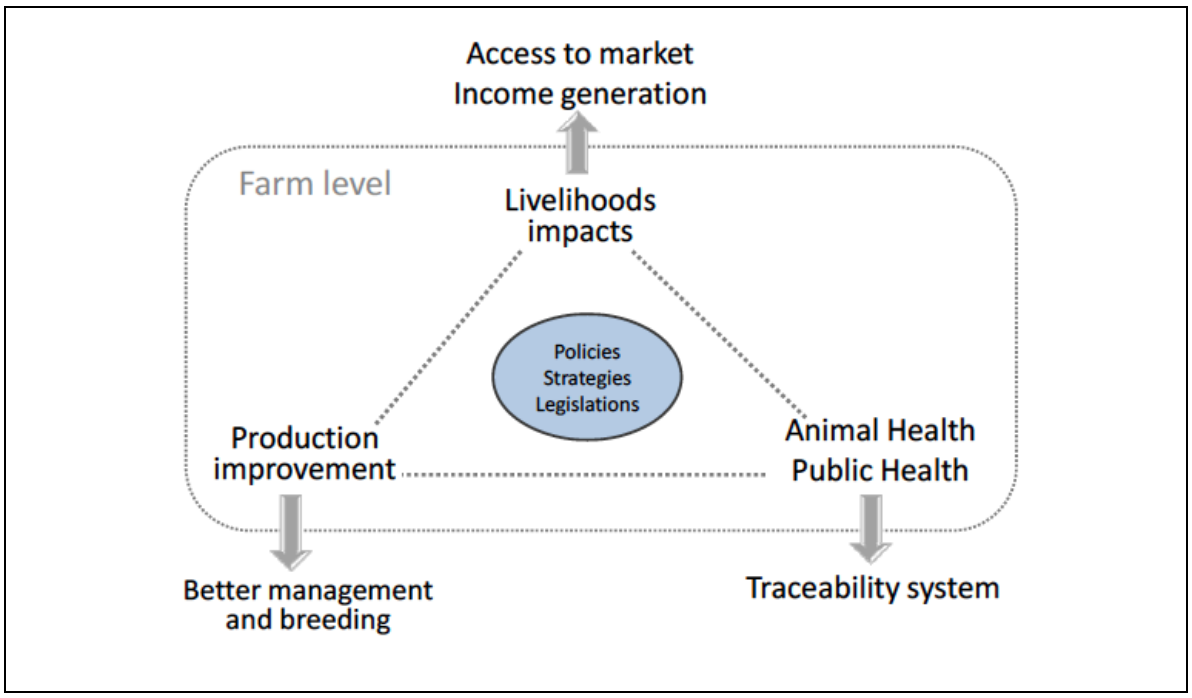
114. The Oceans and Fisheries Partnership between the United States Agency for International Development, the "Southeast Asian Fisheries Development Center" and the "Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security" works to

strengthen regional cooperation to combat illegal, unreported and unregulated fishing, promote sustainable fisheries and conserve marine biodiversity in the Asia-Pacific region.

115. To improve transparency in the seafood supply chain and to help ensure successful implementation, the Oceans and Fisheries Partnership engages a variety of fisheries stakeholders and forms new partnerships among governments, regional institutions and the private sector. Developing partnerships in the commercial seafood industry anchors the partnership's efforts in market realities and provides increased scale and sustainability for project investments.

116. The Partnership supports the development of a transparent and financially sustainable catch documentation and traceability system to help ensure that fisheries resources are legally caught and properly labeled. This risk-based, electronic system will be applied to wild capture fisheries in Southeast Asia and the Pacific region and will be based on the ecosystem approach to fisheries management. The partnership collaborates with technology companies to harness the latest communication and traceability innovations.

Figure 9: Impact Pathways of LITS (Source: FAO 2014)



D. Impact of traceability systems on product quality / price and livelihoods

117. Traceability systems may improve smallholder livelihoods via three distinct pathways as illustrated in the figure below (from FAO 2014). The first path operates through improved control of farm animal diseases and heightened public health and food safety thereby reducing losses (animal IDs can also act as theft deterrent). If coupled to a production improvement program, the system provides additional benefits by increasing production performance and / or reducing production costs. The greatest benefits are obtained when, in addition to the improvement of production conditions, a traceability system is an integral part of a certification scheme, which provides access to higher value markets.

118. The following examples illustrate the potential benefits of certification and traceability schemes, in the absence and in the presence of a price premium, provided they are intended to benefit smallholders and include the necessary coordination and capacity building arrangements.

119. Participants of the Binh Dinh Sustainable Rural Livelihoods Project, implemented by the Binh Dinh Provincial Peoples Committee (PPC) and the New Zealand Government, report that that application of VietGAP procedures in the production of 'certified safe vegetables' reduces production cost (roughly 10-20%) because inputs on seed, pesticides, fertilizers and labor are reduced. As a consequence, the production of safe vegetables is worthwhile even if sold to traders and the wet market as usual and not to higher value outlets.

120. With organic shrimp certification in place, the previously mentioned Mangroves and Markets project guided farmers in negotiating a favorable purchase agreement with Minh Phu, the world's second-largest seafood processor by shrimp export value. The farmers sell their shrimp at a 10-percent price premium with significant benefits. The net income from selected integrated mangrove-shrimp farming in 2013 has increased 1.5 times by comparison with traditional shrimp aquaculture or rice-shrimp without mangroves. Previously, farmers could make 60 to 70 million VND per year. Having joined this project, they are able to make 150 to 200 million VND.

121. In addition to higher profitability the above projects increased the volumes of product delivered by participating smallholders and provided a more stable marketing environment (in addition to enhancing sustainability of production).

E. Prerequisites for smallholder inclusion in traceability systems

122. The experience of the fresh fruit and vegetable sector, where traceability initiatives are perhaps most advanced, suggests a loss of competitive advantage held by smallholders in developing countries. Numerous researchers highlight that whilst the

heightened demands of global markets may offer opportunities of poverty reduction amongst smallholders, this requires substantial strengthening of local institutions to provide enabling factors and coping strategies.

123. The high costs, for producers, of dealing with vertically coordinated global commodity chains are a potential threat to the future of smallholder production systems. There are specific concerns about the marginalization of smallholders in the global economy due to the entry barriers associated with traceability requirements. At another level, there are logistical concerns due to the costs of monitoring and organizing scattered remote smallholders who are involved in extended and complicated supply chains.

124. Various case studies on smallholder inclusion in certification / traceability schemes have demonstrated the importance of strong institutional support in facilitating continued access to higher value markets.

125. The responsibility for establishing an appropriate legal framework, linked to a supportive bureaucracy, rests on national and local governments. Public sector support would also be required to conform with aspects of a global traceability regime, such as testing, regulation of certification procedures, in-country inspection systems and facilitating the development of affordable and credible social and environmental auditing capacity.

126. Furthermore, adequate "support packages" (credit + technical assistance) for small and medium scale entrepreneurs need to be made available and supply chain actors need to be coordinated, preferably by private sector actors.

F. Conclusions

127. Although a prerequisite for better market access and incentives to invest in product quality/value, LITS will deliver major net positive livelihoods impacts only if supported by complementary policies and institutions. LITS appears more promising when it can be part of a more comprehensive commitment to raise smallholder incomes by improving their production methods, following incentives to comply with product standards that confer a price premium (e.g. 'safe', 'organic', 'sustainable', 'halal', etc.), whereby the traceability system permits 'certification' of the attribute.

128. Such certified supply chains should utilize existing institutions, even with the understanding that some practices will have to change. Creating a supply chain independent of existing markets would slow down the introduction of certified supply chains, significantly increase costs, and might lead to displacement of eligible incumbent market actors. Across the GMS, as in most developing countries, supply chains

constitute networks of low-income entrepreneurs, and thus the pro-poor multiplier effects of the enhancement of these chains can be very substantial.

129. When initiating LITS and certified supply chains, a small number of innovations should be introduced. These should be innovations that can easily be adopted by the private sector in a short period of time without large infrastructure investments, complex technology adoption, or dramatic changes in traditional practices. With replication, the benefits of certified supply chains become apparent and gain support.

130. Consumer preferences provide both the social and financial basis for certified supply chain approaches. Household surveys and other types of economic analysis not only provide information on the willingness to pay for certification, but also information on consumption and attitudes that can underpin future marketing efforts.

131. Feedback mechanisms are critical. The involvement of existing institutions reinforces this through visibility to various stakeholders. Projects of this nature must have links to government, the private sector, and the broader community involved in the commodity at hand. Over time, all of these actors will need to be involved in building up the scope and capacity of certified supply chains.

132. A regional system needs an international organization, representing the national stakeholders, to coordinate and manage the system. In the context of the GMS and potentially wider adoption, possible management should include the ASEAN sectoral working group on livestock, which also manages the ASEAN Regional Animal Health Information System (ARAHIS).

VI. Institutional Assessment for Public-Private Partnership

133. Public-Private Partnerships (PPP) traditionally consisted of agreements between public sector agencies and private companies geared toward major infrastructure projects. Recently, however, PPPs have taken on varied forms where partners include groups such as national governments, foreign governments, regional or international bodies, donors, and NGOs. In principle, PPPs combine private sector experience with public sector vision and allow partners to achieve more together than they could separately. Benefits include shared financial responsibilities, shared risk undertaking, and the ability to combine implementation experience (often from the private sector) with broad visions for socially beneficial projects (from the public sector). These arrangements can include a variety of project types including projects in agrifood sectors.

134. The institutions in the GMS required to implement SPS standards and improve agrifood value chains are often underfunded. For example, a recent World Bank report analyzing operational costs of trade related SPS activities in Lao PDR found that the government's annual allotment for SPS activities represented 5% of the costs the World Bank estimated would be required to implement a minimum sized SPS system (World Bank 2010). These circumstances are not uncommon. Funding for infrastructure in several GMS countries is sourced largely from user fees for services provided by state-owned enterprises (SOEs) and SOEs have a limited capacity to borrow funds due to the lack of availability of long-term debt in local financial markets (ADB 2012). Put simply, the scope of widespread SPS activities are prohibitively costly for many governments. PPPs have potential to share a role in the financing of these activities and increase the likelihood of project feasibility.

135. This section proceeds as follows. First, drawing on past PPPs around the world, we attempt to identify shared characteristics among successful projects and highlight common challenges faced. Following this discussion we examine options for PPPs in the agrifood sector and provide some examples of past successful PPPs in this sector. We conclude by offering recommendations for future partnerships aimed at improving food safety in the GMS agrifood sector.

A. Shared Characteristics Among Successful PPPs

136. PPPs have a long history and there have been many successes and many failures. Drawing on successful examples, there appear to be common characteristics that can serve as broad guidelines for future projects. Here we identify five characteristics that are common among successful projects.

1. Shared incentives

137. In order for a project to be successful, it is important that all parties have shared incentives in the success of the project and a similar definition of success. There are many examples of projects that failed because partners had different goals (STDF 2012). Similarly, parties can have different views of what success means. To illustrate, imagine a public-private partnership between a government and a large agrifood company to build food-processing plants in peri-urban areas. The public partner may invest is this project in order to improve smallholder access to markets while the private sector invests in the project to increase supply of processing inputs. If the processing facility is built and utilized, thereby increasing the supply of food inputs available, then it could be considered a success by the private partner. However, if the facility only serves industrial scale producers, then the public partner could view the project as a failure. In this example, project incentives were overlapping but not mutually exclusive. Ensuring that each partner has shared incentives and shared goals is a key element in successful public private partnerships.

2. Clear expectation about financial commitments from both sides

138. It is important for all sides of the partnership to have well defined expectations about their financial requirements, particularly in the event that actual costs exceed expected costs. In the case that costs overrun, negotiations over which party is responsible for the additional incurred costs can become contentious and stall the project or even cause it to fail. Young and Hobbs (2002), Narrod et al (2007) and Ion et al (2014) provide more details of the complexities associated with designing financial commitments within agricultural PPPs.

3. Well defined expectation with respect to risk responsibilities and fair risk management

139. Risk associated with the project should be shared. There is a history of risk being disproportionately assumed by the public partner (Ion et al 2014). In the case that the project fails and goals are never realized each party should share in the losses. Without fair risk sharing the party with less risk responsibility has greater incentives to favor decisions with high risk-high reward outcomes (Reardon et al 2001).

B. 4. Public partner as facilitator

140. Rather than taking over institutions, the public sector should have more of a facilitator role. Governments should not compete and interfere with business. Projects where the public partner assumes too great of a role in the business side of the project tend to be less sustainable in the long run due to fast changing political environments

(STFD 2012). When the private sector takes the lead in business activities and governments facilitate, projects are more insulated from changes in the political climate (FAO 2013d). Moreover, in the long run, the private sector needs to compete with itself, not governments, so that projects are financially sustainable and do not need long-run government support.

5. Well designed legal framework that is flexible enough to allow for unexpected events

141. Long-term large-scale projects inevitably encounter unexpected challenges that may render original plans infeasible. It is important to plan for these unexpected events by designing a contract that allows for flexible response to new conditions. Inflexible contracts that prevent adaptation to the new circumstances have caused many projects to fail.

C. Challenges Associated with PPPs

142. There are many challenges associated with the public and private sectors working together including simply coordinating the parties involved. The sectors tend to have different cultures and this difference can make communication and coordination between the parties difficult (FAO 2008). The more partners involved in the partnership, the more difficult coordination becomes. For example, a promising capacity building PPP between government, NGOs, and corporations in the Netherlands, Indonesia, and Malaysia was recently abandoned because the time consumed in the decision-making and implementation process was deemed excessive (STDF 2012).

143. Differences in public and private sector concerns can also become a problem in other areas. From the public sector's perspective, choosing a private partner can often be seen as giving an unfair advantage or monopoly to a particular firm. This has political implications when the public agency's actions are seen as biased. From the private sector's perspective, changes in political environment are a constant risk. When political opposition arises to a project, or a new government is elected, the project can become at risk of cancellation. Another challenge associated with differences across sectors is that it can be difficult to evaluate the success or failure of a project. Private sector firms tend to not be accustomed to tracking the indicators required for project evaluation and the effort needed to do so an be costly and time consuming (Ion et al 2014).

144. Incorporating smallholders into agrifood PPPs can also be a challenge for these types of projects. Smallholders have different needs than large producers. If special care is not taken to address these needs then smallholders may be omitted from programs targeting the agricultural sector. Credit availability, limited technological capacity, and limited access to markets are key issues that disproportionately affect smallholders

(Narrod et al 2007, Jafee and Henson 2004). However, experience has shown that these challenges can be overcome if they are directly addressed and carefully planned for. NGOs have increasingly become partners in PPPs with the primary goal of representing smallholder farmers' best interests throughout the project cycle.

D. Examples of Agrifood PPPs

145. There are many opportunities for PPPs in the agrifood sector. Here we divide agrifood PPPs into four categories. Projects can be broadly grouped into these categories, however, many projects fall into multiple categories. Below we provide examples of past successful PPPs in each category. This discussion draws on case study reviews of PPPs and SPS Standards discussed in Young and Hobbs (2002), Narrod et al (2007), FAO (2008), STDF (2012), FAO (2013a-c), and OECD/WTO (2013).

1. SPS Dialogue and Coordination

146. Several examples of PPPs related to SPS coordination have been implemented in Mexico. In 2004, Mexico was struggling to enforce its own SPS standards on imported food products. Even though the country had stated standards, limited capacity among inspecting agencies was deeming much of the stated standards ineffective. In order to address this issue the Mexican government partnered with Mexican agrifood companies whose own internal supply chains included highly developed mechanisms for maintaining quality. By partnering with companies experienced in use of state-of-the-art technologies to efficiently monitor food quality, the Mexican government was able to upgrade its own border inspection facilities and reduce the importation of unsafe foods. Not only did these upgrades protect Mexican consumers but they also helped limit the risk of contaminating products from Mexican producers whose supply networks were integrated with import networks.

147. In 2011 the E.U. expressed concerned that imported honey from Mexico might be contaminated by pollen with GMOs. In order to address this concern the Mexican Honey Exporters Association partnered with the Ministries of Economy, Health, and Agriculture to (1) design and implement a strategy to minimize the risk of honey contamination with pollen from genetically modified plants and (2) represent the producers in the dispute presented before the WTO. The result of the project was that Mexican exporters were able to satisfy the E.U.'s concerns and honey exports continued unimpeded.

148. For more than 20 years the Department of Agriculture, Forestry and Fisheries in South Africa has partnered with fruit and vegetable industry groups in order to coordinate compliance with SPS standards that must be satisfied for exports. Activities in this partnership include provision of technical support and negotiation of bilateral trade agreements with importing countries on behalf of producers. The project has proved to

be greatly successful and over the past 20 years the horticulture sector in South Africa has grown to be valued at greater than $3B annually.

2. Infrastructure Development

149. For Uganda, health concerns led to the E.U. stopping importation of fish products. In order to address this problem, a privately owned laboratory partnered with the Department of Fisheries in order to provide high-quality and objective laboratory testing services to certify exports of fish and fishery products from Uganda. This certification process ameliorated E.U. concerns and the market reopened to Uganda producers.

150. In the early 2000s Peruvian producers were struggling with an endemic problem of fruit flies that were continually being reintroduced by contaminated airplanes returning from fruit fly infested countries. In order to address this concern, the Peruvian government partnered with international airports in the affected regions to install infrastructure capable of inspecting airplanes for fruit flies. These investments included X-ray equipment and other inspection facilities. Due to the introduction of this infrastructure, the affected regions have been certified as fruit-fly free zones continually since 2007.

3. Value Chain Development

151. Egypt has long desired to increase its agricultural exports to Europe. In 2013, a PPP was formed to develop smallholder value chains and help producers comply with European safety standards. This agreement included the Ministry of Agriculture in Egypt, Government of Netherlands, and UNIDO. This is an example of a mutually beneficial relationship where the Netherlands was able to secure an additional source of safe food imports and Egypt was able to increase exports, particularly among smallholders.

152. The Ministry of Agriculture in Burkina Faso partnered with local farmers and a large food processor Maxigrana Ltd. in order to improve the quality of sesame seeds that the company was sourcing. Investments focused on capacity building and training to improve quality and address issues related to salmonella and pesticide residues in sesame. In addition, the project established and integrated a quality management system into the sesame supply chain and built a cleaning factory for cleaning harvested seeds. As a result, more than 2,500 producers were able to improve product quality and sell to Maxigrana Ltd. Moreover, the project was so successful that supply of quality sesame seeds exceeded the demand of the private partner and Burkina Faso became the third largest sesame exporter in Africa.

4. Trade Facilitation

153. In 2002, several Thai ministries partnered with Thai food exporters and international technology companies in order to harness smart IT solutions for safe food supply chains and promote high value agricultural exports. Public agencies included the National Bureau of Agricultural Commodity and Food Standards, Department of Livestock, Department of Agriculture, Department of Fisheries, the National Electronics and Computer Technology Centre. Private partners included Thai food producers and exporters and IT companies including IBM, CDG Systems Co. and FXA. Nearly 15 years later, ACFS manages the system and over 100 companies are using it. There is improved access to data about agrifood exports among supply chain partners, certification agencies, food safety inspectors, supply chain partners, and import authorities and Thailand has become a regional leader in food safety and traceability.

154. Fulfilling SPS requirements of international markets can be a time consuming process that slows down trade. Chilean meat exporters were struggling with a slow drug residue certification process. In order to reduce the time required to receive certification, the Ministry of Health partnered with national laboratories and a private software developer called GSP to design an online database of laboratory analysis and sampling. The online system greatly reduced certification time and producers now operate solely with the electronic system with immediate access to laboratory results and certification.

E. Conclusions

155. Public-Private Partnerships are playing ever more important roles in global agrifood value chain development, trade facilitation, and improvement of product quality. Agrifood standards are a major contributor to improving business climates. The previous section described some of the many successful partnerships that have been implemented across the globe.

156. Partnerships must be carefully designed to maximize the chances for success. However, under the right conditions, PPPs can be mutually beneficial relationships that promote safe food at home and abroad. Moreover, experience has shown that it is possible to incorporate smallholders into these agreements if additional steps are taken to address their needs, which differ from larger producers.

VII.References

ACFS (2011). `The Establishment and Application of Standards by ACFS'. Presentation prepared by Pisan Pongsapitch, Director, Office of Commodity and System Standards, ACFS, MOAC. Presented at *International Harmonization Workshop on Standards for Fresh Fruit and Vegetables for Asian Countries*. 15 November 2011. Chiang Mai, Thailand.

ACFS (2016). `ACFS SME Traceability Program'. Presentation prepared by Ponprome Chairidchai, ACF. Presented at *Mainstreaming Electronic Traceability to Facilitate Cross-Border Agrifood Trade in the Greater Mekong Sub-Region*. 27-28 January 2016. Bangkok, Thailand.

ADB (2012). `Assessment of Public-Private Partnerships in Cambodia: Constraints and Opportunities'. Report prepared by ADB in conjunction with ACF. Manila, Philippines. 2012.

ADB (2012). `Trade Facilitation: Improved Sanitary and Phytosanitary (SPS) Handling in the Greater Mekong Subregion (GMS) Trade. Prepared by Linglink Ding and Sununtar Setboonsarng, Southeast Asia Department, ADB. Presented at *CAREC Workshop on Sanitary and Phytosanitary Measures*. 25-26 July 2012. Bangkok, Thailand.

ADB (2013). `Aid for Trade in Asia and the Pacific: Driving Private Sector Participation in Global Value Chains'. Report prepared by ADB in conjunction with WTO. Manila, Philippines. 2013.

AusVet (2011a). Requirements, Prospects and Challenges to Implementing an Animal Identification and Traceability System in the Greater Mekong Subregion – Discussion Document. Submitted to FAO.

AusVet (2011b). Development of a prototype Livestock Identification and Traceability System - Development, simulation and workshop report. Submitted to FAO.

Büthe, T. and M. Walter (2011). 'The New Global Rulers: The Privatization of Regulation in the World Economy', Princeton, Princeton University Press, 2011.

Dabbene, F., Gay, P., and C. Tortia (2014). `Traceability issues in food supply chain management: A review'. Biosystems Engineering 120 (2014) 65-80.

Department of Food and Drug Administration Myanmar (2014). `Updates of Food Safety Regulatory Frameworks'. Prepared by Food Division, Department of Food and Drug Administration. Presented at *Roundtable Discussion on Food Safety and Standards: Tackling Food Safety* Challenges. March 2014. Yangon, Myanmar.

FAO (1998). Secondary guidelines for animal recording in medium input production environment. FAO Rome.

FAO (2003). `Summary analysis of Codes, guidelines, and standards related to Agricultural Good Practices'. Rome, Italy. 10 November 2003.

FAO (2008). `Market-oriented agricultural infrastructure: appraisal of public-private partnerships'. Agricultural Management Marketing and Finance Occasional Paper No. 23. Prepared by Warner, M., Kahan, D., and S. Lehel. Rome, Italy. 2008.

FAO (2014). Draft guidelines for the development of integrated multipurpose animal recording systems. Paper prepared for the Intergovernmental Technical Working Group on Animal Genetic Resources. FAO, Rome.

FAO(2013a). `Report of Workshop on Private Corporate Sector Investment in Agriculture in Southeast Asia'. 10-11 November 2012. Bandung, Indonesia. January 2013.

FAO(2013b) `Public Sector Support for Inclusive Agribusiness Development: An appraisal of institutional models in Viet Nam'. Prepared by Nguyen Tri Khiem. Edited by E. Galvez-Nogales and M. Rankin. Rome, Italy. 2013.

FAO(2013c) `Agribusiness Public-Private Partnerships: A country report of Thailand'. Prepared by Daleen Diane Richmond. Edited by Marlo Rankin and Pilar Santacoloma. Rome, Italy. 2013.

FAO(2013d) `Enabling environments for agribusiness and agro-industries development'. *Regional and country perspectives*. Prepared by Gabor Konig, Carlos da Silva, and Nomathemba Mhlanga. Rome, Italy. 2013.

FAO/WHO (2010). Codex Alimentarius Commission. 'Consideration of the impact of private standards', Rome, 2010.

FAO/WHO Codex Alimentarius (2006). Principles for traceability/product tracing as a tool within a food inspection and certification system. CAC/GL 60-2006

References

Food and Drug Department Lao PDR (2014). `Food Safety Control in Lao PDR'. Prepared by Somthavy Changvisommid, Director General, Food and Drug Department, Ministry of Health. Presented at *Roundtable Discussion on Food Safety and Standards: Tackling Food Safety* Challenges. March 2014. Yangon, Myanmar.

ICAR (2004). – Development of animal identification and recording systems for developing countries, Proceedings of the ICAR/FAO Seminar held in Sousse, Tunisia, 29 May 2004, jointly organized with FAO, ICAR Technical Series No. 9. ICAR, Rome.

International Life Science Institute (2014). `Identifcation of Food Safety Challenges in the Region (CLMV Countries) and Capacity Building Needs. Results from *Workshop and Roundtable Discussion on Food Safety and Standards.* Conference Report Summary. March 5, 2014. Yangon, Myanmar.

International Trade Centre (ITC) (2011). `The Interplay of Public and Private Standards'. *Literature Review Series on the Impacts of Private Standards; Part III*. Geneva, 2011.

Ion, A., Beyard, K. and Sedaca, S. (2014). Synthesis of trends in public-private partnerships (PPPs) for Improving Food Security and Rural Development through Agriculture Report. Prepared by Carana Corporation for the Food Systems Innovation initiative.

Jaffee, S. and Henson, S.J. (2004). Standards and Agri-food Exports from Developing Countries: Rebalancing the Debate. World Bank. Policy Research Working Paper 3348. Washington DC, The World Bank.

Métras R, R.J. Soares Magalhaes, Q. Hoang Dinh, G. Fournié, J. Gilbert, D. Do Huu, D. Roland-Holst, J. Otte and D.U. Pfeiffer (2011) An assessment of the feasibility of a poultry tracing scheme for smallholders in Vietnam. Rev. sci. tech. Off. int. Epiz., 2011, 30 (3), 703-714

Ministry of Commerce Cambodia (2014a), `Current Situation of National Standard Setting in Cambodia'. Presentation prepared by Dim Theng, Lab Director, CAMCONTROL, MOC. Presented at *National Training Workshop on Strengthening Food Standard Setting and Participation in Codex Activities in Cambodia.* Phnom Penh, Cambodia. 19-21 February 2014.

Ministry of Commerce Cambodia (2014b), `Workshop and Round Table Discussion on Food Safety and Standards'. Presentation prepared by Sin Sideth, Deputy Director of Lab Dept, CAMCONTROL. 4-5 Presented at

Roundtable Discussion on Food Safety and Standards: Tackling Food Safety Challenges. March 2014. Yangon, Myanmar.

OECD/WTO (2013). `Aid for Trade and Value Chains in Agrifood'. 2013.

OIE (2010a). Terrestrial animal health code. Chapter 4.1: General principles on identification and traceability of live animals. OIE, Paris.

OIE (2010b). Terrestrial animal health code. Chapter 4.2: Design and implementation of identification systems to achieve animal traceability. OIE, Paris.

Reardon, T., Codron, J-M., Busch, L., Bingen, J. and Harris, C. (2001). Global Change in Agri-Food Grades and Standards: Agribusiness Strategic Responses in Developing Countries. *International Food and Agribusiness Management Review*, 2(3/4): 421-435.

Standards and Trade Development Facility (STDF) (2012). `Public-Private Partnerships to enhance SPS capacity: What can we learn from this collaborative approach?' Joint document of the STDF and the Inter-American Development Bank. Prepared jointly by FAO, OIE, WB, IDB, and WTO. April 2012.

USAID (2005). 'The relationship of third party certification (TPC) to Sanitary and Phytosanitary (SPS) measures and the international agri-trade: Final Report', Washington, 2005.

Vietnam Food Administration (2014). `Workshop and Roundatable Discussion on Food Safety Standards'. Prepared by Nguyen Thi Minh Ha, Vietnam Codex Office, Vietnam Food Administration. Presented at *Roundtable Discussion on Food Safety and Standards: Tackling Food Safety* Challenges. March 2014. Yangon, Myanmar.

World Bank. (2010). `Lao PDR: Operational Costs Of Trade-related SPS Systems'.

Young, L. and Hobbs, J. (2002). 'Vertical Linkages in Agri-Food Supply Chains: Changing Roles for Producers, Commodity Groups, and Government Policy', *Review of Agricultural Economics* 24.2: 428-41.

Yunnan Animal Science and Veterinary Institute (2016). `Implementing a Traceability and Animal Identification System to Address Illegal Cross-Border Cattle Movements in Yunnan Province in China'. Prepared by Li Huachun, Presented at *Mainstreaming Electronic Traceability to Facilitate*

Cross-Border Agrifood Trade in the Greater Mekong Sub-Region. 27-28 January 2016. Bangkok, Thailand.

References