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Harmonizing Food Safety Systems and Increasing Market Access in the Greater Mekong Subregion^{*}

The Discussion Paper Series of the Greater Mekong Subregion's (GMS) Core Agriculture Support Program Phase 2 (CASP2) is a platform for stakeholders of the GMS to examine the current and emerging development concerns affecting the subregion especially on but not limited to, food safety and quality assurance, environmental sustainability, and inclusive agro-based value chains. The papers are posted at the GMS Working Group of Agriculture's (GMS WGA) website (www.gms-wga.org).

The GMS Working Group of Agriculture (GMS WGA) oversaw the development of the discussion papers.

The information and views expressed in the papers are those of the author/s and do not necessarily reflect the official opinion of the GMS WGA.

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Contents

| | |
|--|-----|
| ABBREVIATIONS | III |
| EXECUTIVE SUMMARY | 2 |
| 1. INTRODUCTION | 6 |
| 2. AN OVERVIEW OF FOOD SAFETY CONCEPTS, DRIVERS, AND RISK ANALYSIS..... | 7 |
| 2.1. Key Food Development Issues | 7 |
| 2.2. Drivers of food safety initiatives | 10 |
| 2.3. Risk analysis..... | 11 |
| 2.4. Food safety and quality standards | 12 |
| 3. GMS: AN EMERGING HUB FOR REGIONAL AND INTERNATIONAL FOOD SUPPLY..... | 12 |
| 3.1. GMS food production..... | 12 |
| 3.2. Economic growth and trade..... | 13 |
| 4. DRIVERS OF GMS FOOD SAFETY AND MARKET ACCESS INITIATIVES | 16 |
| 4.1. Increasing burden of foodborne diseases..... | 17 |
| 4.2. Scientific advances | 17 |
| 4.3. GMS trade in food..... | 17 |
| 4.4. Increasing presence of higher volume food supplies, additional processing and longer supply chains..... | 17 |
| 4.5. Consumer awareness and demand..... | 18 |
| 4.6. Changing retailer requirements | 18 |
| 4.7. Infectious diseases and other barriers to export | 18 |
| 5. CURRENT FOOD SAFETY POLICY, INVESTMENT, AND PROJECTS IN THE GMS | 19 |
| 5.1. Current food safety policy landscape..... | 19 |
| 5.2. Roles and responsibilities and chains of command | 21 |
| 5.3. Food safety and food control system infrastructure | 21 |
| 5.4. Notable initiatives | 22 |
| 5.5. Notable Gaps..... | 23 |
| 5.6. Ease of doing business | 24 |
| 6. THE WAY FORWARD | 26 |
| ANNEX..... | 27 |
| REFERENCES..... | 45 |

Figures

| | |
|--|----|
| 1. Interdependence of Food Safety and Improved Market Access of GMS with Organizational and Individual Relations of Stakeholders in the Food Value Chain | 8 |
| 2. Global Estimates of the Incidence of Foodborne Illnesses, their Costs, and Resulting Deaths | 9 |
| 3. Greater Mekong Subregion: Land Use | 12 |
| 4. Greater Mekong Subregion GDP and Trade | 14 |
| 5. Value of Agricultural Exports versus Agricultural Land area, GMS except the People's Republic of China | 15 |
| 6. Normalized Contact Intensity Map for Domestic Chicken–Human Interaction across the Globe | 19 |
| 7. GMS Country Rankings for Ease of Doing Business | 24 |

Tables

| | |
|---|----|
| 1. Examples of Hazards of Importance to Food Safety and Trade in Food Products | 11 |
| 2. GDP and Agriculture Trade of GMS | 13 |
| 3. Alignment of GMS Country Food Safety Policies and Frameworks with ASEAN Frameworks | 20 |

Appendix Tables

| | |
|--|----|
| A1 Definition of Key Terms | 27 |
| A2 GDP and Trade Scenarios in GMS Countries | 28 |
| A3 Food Safety Laws, Regulations, and Implementing Agencies in the GMS | 30 |
| A4a: Gaps Along the Food Chain in the GMS | 33 |
| A4b: Bottlenecks to the Supply of Safety and Quality Assured Food and Increased Market Access for GMS Food Supply | 35 |
| A5. Food Safety Initiatives in GMS Countries, 2011–2017 | 37 |
| A6. Sanitary and Phytosanitary and CODEX Initiatives in GMS Countries | 41 |
| A7 Private-Sector-Driven Initiatives in Food Safety in GMS Countries | 42 |

Abbreviations

| | | |
|------------|---|--|
| ACFS | — | Agricultural Commodity and Food Standard |
| ACIAR | — | Australian Centre for International Agricultural Research |
| ADB | — | Asian Development Bank |
| ADDA | — | Agricultural Development Denmark Asia |
| AEC | — | ASEAN Economic Community |
| AEGFS | — | ASEAN Expert Group on Food Safety |
| AFSP | — | ASEAN Food Safety Policy |
| ALiSEA | — | Agro-ecology Learning Alliance in South East Asia |
| ANAB | — | ANSI–ASQ National Accreditation Board |
| APRIS | — | ASEAN–EU Programme for Regional Integration Support |
| APO | — | Agricultural Productivity Organization |
| AQSIQ | — | General Administration of Quality Supervision, Inspection and Quarantine |
| ASEAN | — | Association of Southeast Asian Nations |
| ASSIST | — | Asia Society for Social Improvement and Sustainable Transformation |
| ASWGC | — | ASEAN Sectoral Working Group on Crops |
| AWGFI | — | Ad-hoc Working Group on Food Irradiation |
| ASWGL | — | ASEAN Sectoral Working Group on Livestock |
| ATIGA | — | ASEAN Trade in Goods Agreement |
| AWG Halal | — | ASEAN Working Group on Halal |
| ASWGFi | — | ASEAN Sectoral Working Group on Fisheries |
| ATFC | — | ASEAN Task Force on Codex |
| CAMCONTROL | — | Cambodia Import–Export Inspection and Fraud Repression Directorate General |
| CASP | — | Core Agriculture Support Program |
| CCTF | — | China Children and Teenagers' Fund |
| CEDAC | — | Cambodian Center for Study and Development in Agriculture |
| CFSA | — | Food Safety Risk Assessment |
| CLM | — | Cambodia, Lao PDR, and Myanmar |
| CLMV | — | Cambodia, Lao PDR, Myanmar, and Viet Nam |
| DAE | — | Department of Agricultural Extension |
| DCA | — | Department of Consumer Affairs |
| DDC | — | Department of Disease Control |
| DEG | — | Deutsche Investitions-und Entwicklungsgesellschaft mbH |
| DFDA | — | Department of Food and Drug Administration |
| DFT | — | Department of Foreign Trade |
| DLD | — | Department of Livestock Development |
| DMS | — | Department of Medical Sciences |
| DOA | — | Department of Agriculture |
| COD | — | Center for Organic Development |
| DOF | — | Department of Fisheries |
| DOH | — | Department of Health |

| | | |
|---------|---|---|
| DOR | — | Department of Rice |
| DRI | — | Department of Research and Innovation |
| EU | — | European Union |
| EWG-MRL | — | Expert Working Group on MRLs of Pesticides |
| FAO | — | Food and Agriculture Organization of the United Nations |
| FDA | — | Food and Drug Administration |
| FIA | — | Food Industry Asia |
| FMT | — | Global Food Market Theme |
| FSOC | — | Food Safety Operation Center |
| GAP | — | good agricultural practices |
| GDA | — | General Directorate of Agriculture |
| GDP | — | gross domestic product |
| GDCE | — | General Department of Customs and Excise |
| GFSI | — | Global Food Safety Initiative |
| GHP | — | good hygiene practices |
| GI | — | Geographical Indication |
| GIZ | — | Deutsche Gesellschaft für Internationale Zusammenarbeit, GmbH |
| GPS | — | global positioning system |
| GMP | — | good manufacturing practices |
| GMS | — | Greater Mekong Subregion |
| GRET | — | Groupe de Recherches et d'Echanges Technologiques |
| HACCP | — | hazard analysis critical control point |
| HRD | — | human resource development |
| ICT | — | information and communication technology |
| IPM | — | integrated pest management |
| ISO | — | International Organization for Standardization |
| JICA | — | Japan International Cooperation Agency |
| LDC | — | least developed country |
| MAC | — | Ministry of Agriculture and Cooperatives |
| MAF | — | Ministry of Agriculture and Forestry (Lao PDR) |
| MAFF | — | Ministry of Agriculture, Forestry and Fisheries (Cambodia) |
| MARD | — | Ministry of Agricultural and Rural Development |
| MEF | — | Ministry of Economy and Finance |
| MHS | — | Ministry of Health and Sports (Myanmar) |
| MI | — | Mekong Institute |
| MIC | — | Ministry of Industry and Commerce (Lao PDR) |
| MIH | — | Ministry of Industry and Handicraft |
| MOALI | — | Ministry of Agriculture, Livestock, and Irrigation (Myanmar) |
| MOC | — | Ministry of Commerce (Cambodia) |
| MOE | — | Ministry of Education |
| MOGPA | — | Myanmar Organic Grower and Producer Association |
| MOH | — | Ministry of Health |
| MOIT | — | Ministry of Industry and Trade |

| | | |
|-------|---|---|
| MPH | — | Ministry of Public Health |
| MRLs | — | maximum residue limits |
| NFC | — | National Food Commission |
| NFI | — | National Food Institute |
| NHC | — | National Health Commission |
| NNS | — | National Nutrition Strategy |
| NORAD | — | Norwegian Agency for Development Cooperation |
| NZAP | — | New Zealand Aid Programme |
| NVA | — | Natural Agriculture Village |
| OCPB | — | Office Consumer Protection Board |
| PFPWG | — | Prepared Foodstuff Product Working Group |
| PGS | — | participatory guarantee systems |
| PPP | — | public-private partnership |
| SAFE | — | Structured Program to Achieve Food Safety Excellence |
| SAEDA | — | Sustainable Agriculture & Environment Development Association |
| SEAP | — | safe and environment-friendly agrifood product |
| SPS | — | sanitary and phytosanitary |
| STDF | — | Standards and Trade Development Facility |
| TBT | — | technical barriers to trade |
| TISI | — | Thai Industrial Standards Institute |
| TOAF | — | Thai Organic Agriculture Foundation |
| UCLA | — | University of California, Los Angeles |
| UNIDO | — | United Nations Industrial Development Organization |
| UNOPS | — | United Nations Office for Project Services |
| VECO | — | Vredes Eilanden Country Office |
| VOAA | — | Vietnam Organic Agriculture Association |
| WHO | — | World Health Organization |
| WTO | — | World Trade Organization |

Executive Summary

Introduction

The Greater Mekong Subregion (GMS) comprises Cambodia, the autonomous regions of Guangxi and Yunnan in the People's Republic of China (PRC), the Lao People's Democratic Republic, Myanmar, Thailand, and Viet Nam. Economic growth in the GMS countries over the last 2 decades has been remarkable, averaging 7.5 % of gross domestic product (GDP) per capita at purchasing power parity between 1992 and 201 (AD4B 2016). During this period, the GMS nations have achieved dramatic reductions in poverty and admirable increases in food security.

Although food security—the availability of and access to food—has improved in the GMS, breakdowns in food safety systems continue to occur with alarming frequency. In the past, food safety issues in the GMS were primarily the concern of exporters seeking access to higher-value markets. However, domestic demand for safety assured products is rising and the costs of food safety failures are increasingly well-recognized among businesses and policymakers. In response, improving food safety is now enshrined in the agricultural development strategies of each GMS country.

The costs of foodborne illness are substantial. The World Health Organization (2015b) estimated that in South East Asia region, the annual burden of foodborne diseases includes more than 150 million illnesses, 175,000 deaths, and 12 million disability-adjusted life years. Further, an estimated 75% of emerging infectious diseases in humans are zoonoses, and the GMS is among the highest risk areas in the world for emerging infectious disease events (Jones et al. 2008; Hill et al. 2015; Taylor et al. 2001). Emerging infectious diseases are significantly correlated with socioeconomic, environmental, and ecological factors.

Establishing harmonized food safety policies and effective surveillance systems is a major challenge for global food supply and a priority for the GMS countries. Yet this is essential to ensure that consumers and producers are appropriately protected in an inclusive and sustainable manner and to meet increasingly stringent requirements of export markets and GMS retailers.

This paper provides a background of the food safety situation in the GMS. It begins with an overview of the subregion and the food safety situation at present. The key gaps and constraints to ensuring harmonized food safety standards are identified, and recommendations for the “way forward” to achieving improved food safety and market access for GMS agrifood products are proposed.

Overarching Trends in GMS Food Supply

The bulk of agricultural production in the GMS is consumed locally and the large majority of producers continue to operate subsistence or semi-commercial systems in fluid, often weakly connected market networks. However, considerable concentration and vertical integration in food supply is occurring, leading to geographically longer supply chains that frequently cross national borders. The introduction of improved genetics, inputs, and production practices, and the intensification and increasing mechanization of production has led to increasing productivity in many areas; however, productivity has largely plateaued in the most productive regions. Local environmental degradation threatens future productivity in densely populated and intensively farmed areas, such as the Mekong Delta. And the

predicted effects of climate change may alter conditions to the extent that traditional production systems may no longer be viable in some areas. In addition, high rates of urban migration further threaten the future of smallholder agriculture in the GMS. The decline of smallholder agriculture in the GMS could come at considerable social, economic, environmental, and biological costs. Revitalizing the agricultural economies of the GMS can support sustainable smallholder supply to drive further reductions in poverty and vulnerability and help to stem the flow of people away from the countryside.

Key constraints for smallholders and new entrants in GMS agriculture typically include lack of information, credit, inputs, and the specific services necessary to engage fully in efficient market value chains. Smallholders may struggle to compete on price, due to their limited scale and lack of capacity to meet the volume or quality and safety assurance standards required by buyers. These factors can limit access to the more stable and/or lucrative markets enjoyed by established players.

Changing food demand and food safety risk. Rising consumer awareness is increasing demand for safety assured food, and changing food supply systems are affecting food safety risks. Strong economic growth in the GMS has been closely associated with rising household incomes and a growing middle class. An increasingly urbanized population and skyrocketing access to information online mean consumers are better informed of food safety risks and more discerning in their choices. Demand for processed foods has increased, and food supply chains and retailing are evolving quickly with increasing concentration, integration, and the proliferation of supermarkets.

Key concerns. Current high-priority foodborne hazards include a wide variety of foodborne pathogens and chemical residues. In addition, zoonoses, infectious animal diseases, pests, and residues limit market access for products. Increases in GMS food trade and high-volume food suppliers and longer supply chains present different and potentially higher levels of risk from key hazards. In this context, agricultural stakeholders are under increasing pressure to demonstrate good management of food safety and broader hazard risks in order to protect domestic consumers, meet customer requirements, and gain access to export markets.

Gaps in GMS Food Safety Systems and Barriers to Market Access

Although the GMS countries have generally made progress in upgrading food safety systems, increasing market access, and facilitating trade, further improvements are needed.

Surveillance systems in the GMS vary considerably in their design and implementation. Standards such as national good agricultural practices (GAP) differ between GMS countries and are not benchmarked to ASEANGAP. Risk-based approaches that address priority hazards the length of value chains are needed to ensure product safety and to maintain and increase market access.

Interagency coordination is often limited and roles and responsibilities and chains of command are frequently uncertain. Furthermore, research institutes and the private sector are not adequately represented and engaged in the discussion and establishment of standards, guidelines, and systems.

Food testing capacity is limited, often unable to achieve accreditation to international standards of proficiency. GMS suppliers are often either unable to demonstrate product safety, barring them from markets, or must send samples outside their country, typically incurring additional direct costs, opportunity costs, and waste. Availability of technical and operational resources between and within GMS countries remains highly variable. Although

large investments in infrastructure, such as laboratories, have been made in the GMS countries, strategies for covering operating costs are often neglected.

National emergency response plans for food safety hazards, zoonoses, and other infectious diseases are varied in their level of elaboration and capacity to be implemented in a timely, efficient, and effective manner. There are opportunities to coordinate and harmonize emergency response plans at the GMS level and incentives for countries to support control efforts beyond their borders, thereby reducing risks within their own territories.

Risk-based approaches to improving food safety and market access must address whole value chains to be effective. In the GMS, seed, plant protection, feed safety, and veterinary laws are at different stages of development and implementation. On-farm surveillance systems are generally lacking. Postharvest process control systems are in their infancy and vary widely. Transport and storage capacity and quality is highly variable between and within countries. Investments in cold chains and transport hubs are needed to reduce losses in transit and minimize the likelihood of contamination and/or multiplication of hazards in products. Education and communication initiatives can help retailers and consumers improve food handling and thus minimize contamination and waste.

The Way Forward

Risk-based approaches to food safety and broader hazard and risk management are essential for the GMS to address the issues and gaps. Due to the interconnectedness of the GMS food supply systems, it is in the interest of each GMS economy to improve risk analysis capacity for food safety and decrease trade-related hazards in the subregion. There are efficacy and efficiency benefits to coordinating and harmonizing policies and systems across the GMS, to build scale and better protect each country's consumers, industries, and access to export markets. Coordination between countries toward the demonstration of equivalence and benchmarking of standards can be highly beneficial. GMS-wide recognition of standards and systems can increase transparency and accountability and build trust between customers, suppliers, and regulators. Initiatives must engage smaller players, providing them access to certifying services and information about risks and best practices, to better protect all stakeholders. In addition, it is essential that approaches based on whole value chains are adopted to address GMS agriculture's challenges of food safety and market access.

Risk assessment. Coordinating and harmonizing national risk assessment systems can facilitate demonstration of their equivalence in relation to hazards of importance to trade. Sharing surveillance system design and expertise between countries will help all countries identify problems at the early stages and target responses. For example, national and regional hazard lists are needed and further investment in laboratory capacity and proficiency for residue and pathogen testing is needed. Ideally such capacities would be in line with ASEAN and international food reference laboratory standards. While each country is building such capacities, facilitating the transfer of samples to accredited laboratories within the GMS will help identify priority hazards and assess the risks from them. Given the close ties and shared borders between the GMS countries it is in the interest of each nation that technical expertise and data be shared between countries openly and in a timely fashion. Platforms such as the ASEAN Risk Assessment Centre for Food Safety and the voluntary ASEAN Rapid Alert System for Food and Feed offer methods of sharing data, knowledge, and technical expertise and building GMS risk assessment capacity to regional standards across the subregion (ASEAN 2017).

Risk management. Investment is needed to improve physical risk management infrastructure. Transport infrastructure such as roads, transport hubs, storage facilities, and cold chains can mitigate risks, particularly to perishable products. Investment in quarantine

stations, product handling facilities, and other infrastructure needed to establish hazard control zones can also help. Policies that encourage the establishment and accreditation of sustainable, accessible certification bodies are, likewise, required. Defined budgets and cost coverage mechanisms are required for operating and maintaining risk management systems, to keep them useful.

The roles and responsibilities of the government and private sector interests and chains of command in emergency responses must be established in accordance with best practices (FAO 2012). Moreover, investment in technical and management training is needed to build system capacity. Emergency response plans for food safety, zoonotic, and wider infectious diseases need to be established and/or revised in the GMS countries, and should be harmonized between the closely associated countries of the subregion. The importance of building leadership cannot be overstated. Joint simulation exercises present an opportunity to strengthen capacity and collaboration within the region.

Risk management systems must adopt inclusive whole chain approaches to be effective. Public–private partnerships can help to establish sustainable, effective, and fair risk management systems. Furthermore, research and teaching institutions can add significant value when included in exercises to optimize systems and build future capacity for risk management.

Risk communication. Current communication channels between risk assessors and risk managers can be strengthened. Messages to all stakeholders must be clear and consistent. Clear messaging on risk and best practices will build trust among consumers, retailers, and agricultural product suppliers while reassuring export markets. Current data sharing and risk communication initiatives within and between GMS countries can be improved. To be effective, awareness raising initiatives about priority hazards, risks, and best practices for risk mitigation must be dynamic, timely, and targeted to consumers, retailers, and suppliers.

Continued engagement with regional food safety initiatives can bolster food safety systems. The 2012 Regional Food Safety Strategy was endorsed by the GMS member countries; the subregion is also engaged in the International Food Safety Authorities Network, through national focal points; Codex Alimentarius (Food Code) committees and focal points for the World Organisation for Animal Health and International Plant Protection Convention (WHO 2012, 2012). Furthermore, the GMS economies, except the Chinese autonomous regions, contribute to the ASEAN Food Safety Network for which Thailand is a coordinator (ASEAN 2017). These and other platforms present opportunities for mentoring, knowledge and data sharing, and coordination and harmonization of current systems.

The accompanying discussion paper—Increasing the Safety and Quality of Food Products from the Greater Mekong Subregion—provides a more complete assessment of gaps and provides specific recommendations and short-term initiatives to improve GMS food safety systems and increase market access for GMS food suppliers.

1. Introduction

The Greater Mekong Subregion (GMS) comprises Cambodia, the autonomous regions of Guanxi and Yunnan of the People's Republic of China (PRC), the Lao People's Democratic Republic (Lao PDR), Myanmar, Thailand, and Viet Nam. The GMS countries have enjoyed remarkable economic growth over the last 2 decades, averaging 6.4% of gross domestic product (GDP) per capita (at purchasing power parity) between 1992 and 2015 (ADB 2016). During this period, the GMS nations achieved dramatic reductions in poverty and admirable increases in food security.

Although food security—the availability of and access to food—has improved in the GMS, breakdowns in food safety systems continue to occur with alarming frequency. In the past, food safety issues in the GMS were primarily the concern of exporters seeking access to higher-value markets. However, domestic demand for safety assured products is rising and the costs of food safety failures are increasingly well-recognized among businesses and policymakers. In response, improving food safety is now enshrined in the agricultural development strategies of each GMS country.

Market access for GMS agricultural products continues to be hampered by variable ability to demonstrate effective and equivalent risk assessment and control systems for foodborne hazards, infectious diseases, and pests of importance to trade. This is particularly apparent among smaller players in food systems, who are hindered by their limited scale, the high costs of certification, and availability and access to appropriate certification bodies.

Establishing harmonized food safety policies and effective surveillance systems that ensure consumers and producers are appropriately protected in an inclusive and sustainable manner is a major challenge for global food supply and a priority for the GMS countries. It is essential that producers and the wider business community work closely with policymakers, regulators, and legislators to build optimal systems that protect both consumers and industries in a cost-effective manner.

Addressing food safety and food related hazards can support the creation of a more integrated, climate-friendly agriculture sector in the GMS that sustainably harnesses the sector's competitive advantages and unique characteristics. Modernization of trading systems and linking of regional markets can help suppliers meet changing patterns of consumption while presenting opportunities to sustainably strengthen supply. Opportunities exist to increase and diversify GMS exports and establish the GMS as a recognized supplier of safe, high quality, environment- and climate-friendly products in regional and global markets.

A candid assessment of current policy gaps and priorities related to investment at national and GMS levels is needed to achieve the goal of establishing the subregion as a leading regional and global supplier of safe and environment-friendly agrifood products (SEAPs). Identifying the right policies and investments, through the combined efforts of GMS governments, the private sector, civil society, and development partners, can harness the considerable strengths of the subregion in agriculture and food production and build the capacity needed to protect domestic consumers and industries adequately while unlocking new markets.

This paper provides an overall background of the food safety situation in the GMS in terms of risks, the current policy and investment environment, and implications for public health and market access. It first provides an overview of key concepts relating to food development, the link between food safety and market access, the key drivers of food safety initiatives, and the importance of risk analysis. Attention then turns to the GMS, beginning

with an overview of the subregion, the current agro-based value chains, and the food safety situation at present. The paper then discusses the key gaps and constraints. Finally, recommendations for the “way forward” to achieving improved food safety and market access for GMS agro-food products are proposed.

The accompanying discussion paper—Increasing the Safety and Quality of Food Products from the Greater Mekong Subregion—provides a more comprehensive assessment of gaps and offers specific recommendations and short-term initiatives to progress GMS food safety systems and increase market access for GMS food suppliers.

2. An Overview of Food Safety Concepts, Drivers, and Risk Analysis

2.1. Key Food Development Issues

Food Security. In the aftermath of the 1997 global food price crisis, a number of fundamental food development issues became apparent. The abrupt rise in the price of cereals at that time, especially of rice, the staple of Asian diets, highlighted the importance of food security. Food security is recognized as a fundamental human right. Despite international efforts to end hunger it remains a global challenge both in terms of availability and food preferences but also in terms of food safety, quality, and nutritional value (ACIAR 2017). Although the GMS countries have made admirable achievements in terms of food availability and access, challenges remain, particularly in relation to food safety and nutritional value.

The Food and Agriculture Organization (FAO) of the United Nations defines food security as “when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO 2015). The concept of food security is founded on the four related components of availability of food, access to food, utilization of food as a source of nutrition and overall health, and stability of food supply. That food is safe and nutritious is a foundation of the concept food security. Therefore, food safety is an essential part of the human right to food security.

Maintaining and increasing global food security will only become more challenging as the world’s population grows toward 9 billion by 2050. In addition, while global poverty levels are declining, malnutrition—due to undersupply of food—and obesity remain a blight on the world’s populations, and malnutrition in the form of poor diet is growing.

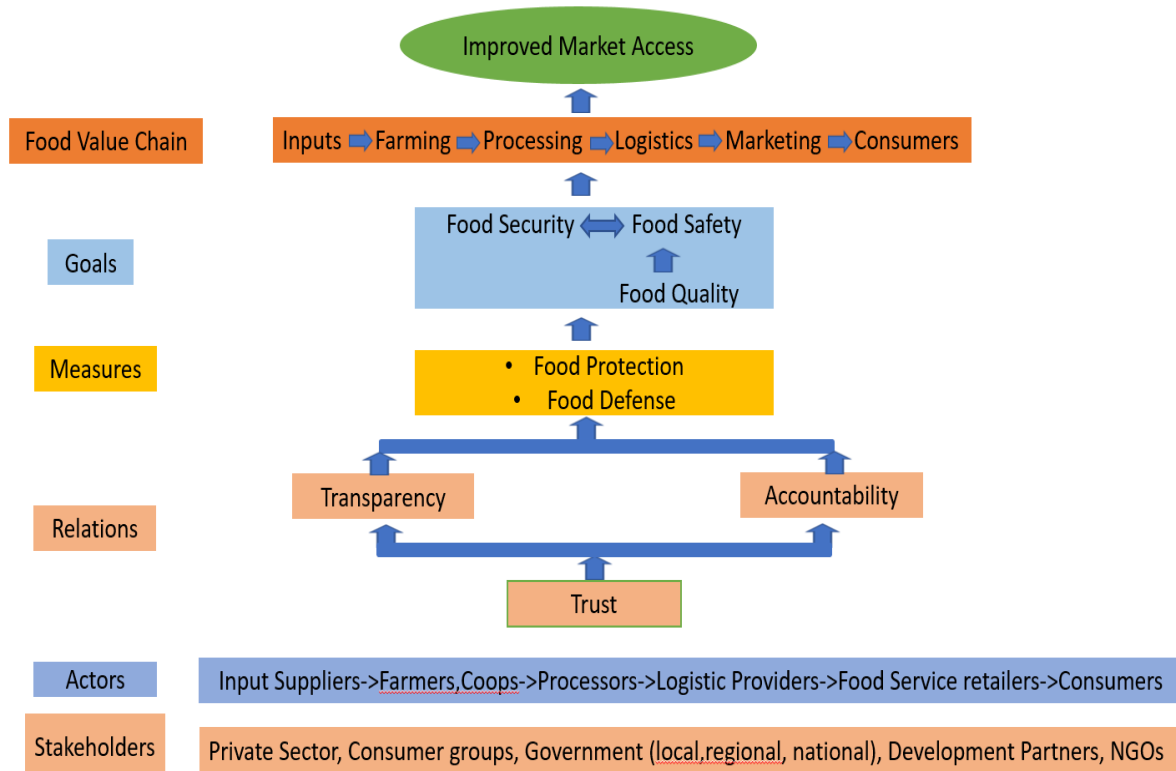
Increasing the efficiency of food value chains is part of the solution. Losses and waste in food supply need to be minimized. Supply of higher-quality, more nutritious food that minimizes damage to natural resources is essential. Continued progress requires a concerted effort among the multitude of stakeholders involved in global food supply chains. These include initiatives—food protection and food defense measures—that increase food system stability and protection from unintentional and intentional food adulteration.

Food safety, food quality, food protection, and food defense are linked (Figure 1), emphasizing the importance of applying measures the length of food value chains.¹ The effectiveness of these measures in protecting consumers and food industries hinges on the

¹ Annex Table A1 provides a glossary of key terms.

establishment of transparent and accountable relationships between key stakeholders in food chains, which is anchored on building trust between players.

Figure 1: Interdependence of Food Safety and Improved Market Access of GMS with Organizational and Individual Relations of Stakeholders in the Food Value Chain



GMS = Greater Mekong Subregion, NGO = nongovernment organization.

Food safety and market access. Foodborne hazards arising from unsafe food are a major global public health and economic burden. Recognition of the impacts of unsafe food has increased among consumers, suppliers, and governments, in both developed and developing economies. The increasing globalization of food supply has changed the food safety landscape—food safety systems must be adjusted to meet new challenges.

The costs of food safety failures are manifold, including the direct costs of healthcare, lost labor, lost tourism, and loss of consumer and retailer confidence in suppliers and food industries. Moreover, foodborne hazards found in products can lead to the costly rejection of consignments and loss of trading partners' confidence. This, in turn, can lead to higher regulatory burdens and/or loss of market access under the terms of the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary (SPS) Measures. Companies and entire industries can become embroiled in food safety scandals. Recovery from such scandals can take years, or not happen. An example is the continued impact that the 1993 *Escherichia coli* outbreak at Jack in the Box restaurants had on United States (US) food standards, Chipotle's ongoing food safety crisis, the costs of the 2008 melamine scandal in the PRC (estimated to be in the tens of billions of dollars), and the multidimensional effects of the recent horsemeat and place of origin scandals in the European Union (EU).

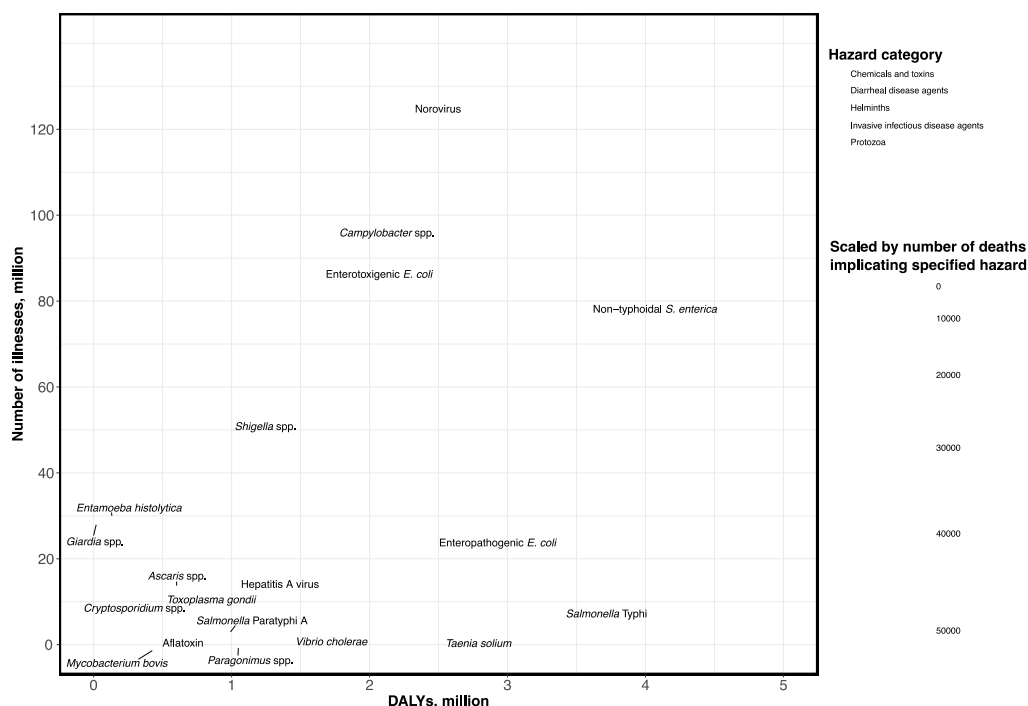
More than 600 million cases of foodborne illness are estimated to have occurred globally in 2010, causing over 5.5 million disability-adjusted life years (Havelaar et al. 2015). The World Health Organization (WHO 2015a) estimates that foodborne illnesses account for 420,000

deaths worldwide each year. Pathogenic foodborne bacteria and viruses are the greatest contributors to total numbers of foodborne illnesses, costs, and deaths (Figure 2). Parasites, chemicals, and toxins are also major contributors, although the numbers are lower in surveillance data because they are typically harder to isolate and/or diagnose. They also often causing long-term sequelae. Moreover, specific hazards may be more or less prevalent in different contexts and geographic regions, influenced by a multitude of factors including climate, human and animal population density, level of development, the capacity of food safety systems, culture, and politics.

The food safety, animal, and plant health requirements for trade between countries were established under the Sanitary and Phytosanitary (SPS) Agreement of the World Trade Organization (WTO) in 1995. The SPS agreement “permits countries to take legitimate measures to protect the life and health of consumers, animals and plants provided such measures can be justified scientifically and do not impede trade” (ARAC 2017). The SPS Agreement is founded on the principles and application of risk analysis and the demonstration of system equivalence in relation to hazards, typically reliant on internationally, or bilaterally, agreed standards, norms, and/or risk analysis systems. Codex Alimentarius establishes standards, guidelines and codes of practices related to food and food safety, the World Organization for Animal Health maintains the equivalent requirements for disease and zoonotic agents among production animals, and the International Plant Protection Convention manages the equivalent for plant-based hazards (FAO and WHO 2003, 2001, 2009, 2010, 2012, 1995; FAO 2013; OIE 2016).

Access to export markets is also affected by business environments, including national policies, regulations, and legislation. The potential value of increased international trade flows through trade facilitation is estimated to be in the hundreds of billions, and emerging economies are expected to gain the most.

Figure 2: Global Estimates of the Incidence of Foodborne Illnesses, their Costs, and Resulting Deaths



Note: Global estimates of number of foodborne illnesses, cost of foodborne illnesses in disability-adjusted life years (DALYs) and number of deaths by hazard per year (based on estimates from 2010). Figure produced from

supplementary data in Havelaar et al. (2015), less significant contributors to the global health burden (<600,000 DALYs per year, <2,000,000 illnesses per year, <10,000 deaths per year) have not been labeled.
Source: Figure produced from supplementary data published in Havelaar et al. (2015).

2.2. Drivers of food safety initiatives

Five key drivers of food safety initiatives have emerged in the global setting: (1) the increasing burden of foodborne diseases, (2) scientific advances, (3) high volume production and processing of foods and longer supply chains, (4) consumer awareness and demand, and (5) changing retailer requirements. These are discussed briefly below, and are elaborated on in the GMS context of GMS in subsequent sections.

Increasing burden of foodborne diseases. The global costs of foodborne diseases are considerable and appear to be increasing. Foodborne disease impacts economic development. For example, in the US economic losses from foodborne illnesses increased from \$35 billion in 1997 to \$152 billion in 2010.

Scientific advances. Scientific and technological breakthroughs are increasing our ability to detect and differentiate hazards, to attribute the ultimate sources of hazards, and to accurately assess the risk they pose. Technologies are rapidly developing and becoming commercially viable, such as routine application of whole genome sequencing technologies, rapid on-site testing and traceability systems based on global positioning systems. Innovative concepts, such as the use of unmanned aerial vehicles (drones) could have commercial applications to make food safer in the near future (Schroeder 2015). Along with data analytics, these technologies can enable tighter controls along the entire length of supply chains, and could considerably improve the quality and efficiency of risk assessment. Such advances can increase accountability and enable companies to respond more quickly and efficiently, such as during product recalls. In addition, traceability and social media can provide consumers with unprecedented access to information on product origin and safety.

High volume production and processing of foods and longer supply chains. The industrialization and globalization of food supply has changed the risk profile of many foods. The advent of large-scale production and processing has increased efficiency and uniformity of product, but a failure of just one control step can lead to widespread risk of consumer exposure to hazards. Furthermore, responses are complicated by the geographic scope, level of exposure, and longer shelf lives that risk consumers storing contaminated product for extended periods. Longer and/or more complex supply chains also increase the risk of poor food handling; for example, high storage temperatures and cross-contamination can increase and multiply hazards.

Consumer awareness and demand. Globally, consumer awareness of foodborne hazards is increasing, and is reflected in increasing demand for safer products. Eating habits are changing, urban populations are growing, abilities to diagnose foodborne disease and attribute source are improving, and public access to information is increasing via the proliferation of information sources such as social media. The internet allows consumers access to vast quantities of information relating to food and health issues. At the same time, social media enable consumers to share and document their views on the quality and safety of food products. High-profile food safety and food fraud scandals trigger public outrage and damage trust in food industries and governments.

Changing retailer requirements. Voluntary safety and quality standards among retailers are increasingly stringent, typically outstripping national regulatory requirements. Developing countries are becoming more integrated into the global food market, due to increased consumer demand in Western countries for a year-round supply of exotic products and

global sourcing by food retailers. However, standards are becoming increasingly difficult to meet and the risk of wasting safe food is increasing due to the designation of products as substandard for aesthetic or other reasons.

2.3. Risk analysis

Effective risk analysis is now widely regarded as the optimal solution for monitoring and controlling agricultural hazards. Appropriately designed and implemented risk-based approaches can provide more cost efficient means of effectively protecting domestic agriculture and consumers, more objective evidence to better direct policy and resources, and increase access to export markets.

Ideally risk-based systems provide cost efficiency and efficacy benefits to risk mitigation and management, although this is often limited by the systems' cost and other practical limitations. However, they are an essential basis for assessing and recommending policy and investment actions on food safety, zoonoses, broader infectious diseases, and pests. Hazards of importance to food safety and trade are numerous; examples are given in Table 1. While the primary objective of hazard control is to protect domestic consumers and industries, risk-based approaches are now often essential for agricultural produce to access international markets under the terms of the SPS Agreement. The objective of risk-based approaches is to reduce the probability of a negative outcome—illness or rejection of a consignment—to levels acceptable to stakeholders (Vose 2008; Manning and Soon 2013; Stärk et al. 2006). To function optimally, risk-based systems must be reliable, transparent, accountable, and trusted.

Table 1: Examples of Hazards of Importance to Food Safety and Trade in Food Products

| | Category | Type | Example | Disease |
|--------------------------|-------------------------------|--|---|---------------|
| Foodborne | Pathogen | Bacterial | Non-typhoidal <i>Salmonella enterica</i> | Salmonellosis |
| | | Viral | <i>norovirus</i> | Enteritis |
| | | Parasite | <i>Taenia solium</i> | Cysticercosis |
| | Residue | Toxin | Heavy metals | Various |
| | | Animal health product/growth promotant | Olaquinox | Various |
| Infectious agents | Non-foodborne zoonoses | | Influenza A virus | Flu |
| | Animal disease (non-zoonotic) | | FMD virus | |
| Pests | Production | Arthropod | <i>Sitophilus oryzae</i> (rice weevil) | |

FMD = foot and mouth disease.
Source: Authors

There has been considerable development in the approaches to and design of risk-based control systems for food. Food safety risk management has evolved from end-product control to whole chain systems. Early food safety initiatives employed heat treatment methods; the subsequent establishment of Codex Alimentarius outlined broader approaches, protocols, and best practices; and the recent increasing application of quantitative risk assessment and legislative and regulatory enforcement of hazard analysis and critical control points and other process-focused approaches. Designation of food safety objectives now seek to establish Appropriate Levels of Protection, particularly in relation to microbial levels in food chains, and the International Organization for Standardization (ISO) has done a great deal to standardize testing protocols and food safety management systems globally (Zweiring 2013; Doménech and Martorell 2016; ISO 2005). Ideally, risk management systems should address risk from inputs (e.g. feed safety, antimicrobials, dioxins, diseases,

and residues) through postharvest steps to consumption (De Busser et al. 2013; Alban et al. 2012; Snary et al. 2016).

Optimal risk management systems seek to provide an adequate level of protection while minimizing the suppliers' burden from direct and opportunity costs and waste. However, the proliferation of voluntary food standards and requirements for supply, primarily for producers and retailers to match or differentiate themselves from their competitors, continues to drive up safety and quality requirements. This can cause unnecessary food waste and exclude smaller suppliers unable to demonstrate compliance with distributor requirements due to the costs, their production scale, and/or limited access to accredited certification bodies.

2.4. Food safety and quality standards

A plethora of food safety standards and guidelines have evolved internationally, many of which are risk-based. In production, these include a variety of holistic standards such as good agricultural practices (GAP) and third party certified organic agriculture. Hazard analysis critical control point and good manufacturing practices are now widely applied in postharvest processing. In addition, culturally driven food safety systems such as halal production and slaughtering provide some food safety assurances. Meanwhile various traceability systems are employed by private companies and there are increasing numbers of public-sector-led systems designed to demonstrate origin, minimize risk of hazard contamination, and aid surveillance and responses. However, enforcement of many of the current safety and quality assurance systems remains highly variable, which has damaged consumer trust.

The following sections discuss the current situation of the GMS in relation to agriculture, food safety, and market access. The discussion will center on the food safety environment in the GMS and will explore the gaps in food safety and market access and the measures required to better protect domestic consumers and businesses and to expand export market access for agro-based GMS products.

3. GMS: An Emerging Hub for Regional and International Food Supply

3.1. GMS food production

The GMS economies (Figure 3), except for the PRC regions, are members of the Association of Southeast Asian Nations (ASEAN) and the recently established ASEAN Economic Community (AEC). The AEC blueprint for 2025 ensures close coordination with the GMS, particularly for reducing economic development gaps between GMS countries.

The GMS has various unique and often unharnessed comparative advantages in specific food supply, built on its abundant natural

Figure 3: Greater Mekong Subregion: Land Use



Source: CEP (2017).

resources, climate, low production costs, proximity to large markets, and unique food items. Currently, the bulk of GMS food production is consumed locally. The large majority of producers operate subsistence or semi-commercial systems in fluid, often weakly connected, market networks. The introduction of improved genetics, inputs, and production practices and the intensification and increasing mechanization of production has increased productivity in most of the GMS. However, productivity has largely plateaued in the most productive regions.

New entrants and small-scale producers in the GMS often lack access to information, credit, inputs, and the specific services necessary to engage fully in market value chains. This can limit access to the stable and/or lucrative markets enjoyed by more established players. Due to limited scale, they may also struggle to compete on price, and lack the capacity to meet the volume or quality and safety assurance standards required by buyers. In addition, environmental concerns threaten production. Local environmental degradation threatens future productivity in densely populated and intensively farmed areas such as the Mekong Delta. And the predicted effects of climate change may alter conditions to the extent that traditional production systems may no longer be viable in some areas.

3.2 Economic growth and trade

The GMS has enjoyed remarkable economic growth during the last 2 decades (Figure 4), averaging 7.5% GDP per capita at purchasing power parity growth between 1992, when the GMS program was launched, and 2015 (ADB 2016). Intra- and extra-GMS trade has, in part, fueled the economic upsurge in the region. However, Cambodia, the Lao PDR, and Myanmar (CLM) remain among the world's least-developed countries, with GDP per capita below \$2,000.

Agricultural products comprise a quarter of the GMS total exports and imports (Table 2 and Annex Table A2).

Table 2: GDP and Agriculture Trade of GMS

| Variable | GMS |
|--|-----------|
| GDP (billion, current \$, 2015) | 11,552.68 |
| GDP per Capita (\$, 2012-2015) | 7,934.00 |
| Trade per Capita (\$, 2012-2015) | 1,483.17 |
| % of Agricultural Export Product Values to Total Export Values | 13.4 |
| % of Agricultural Import Products Values to Total Import Values | 8.2 |

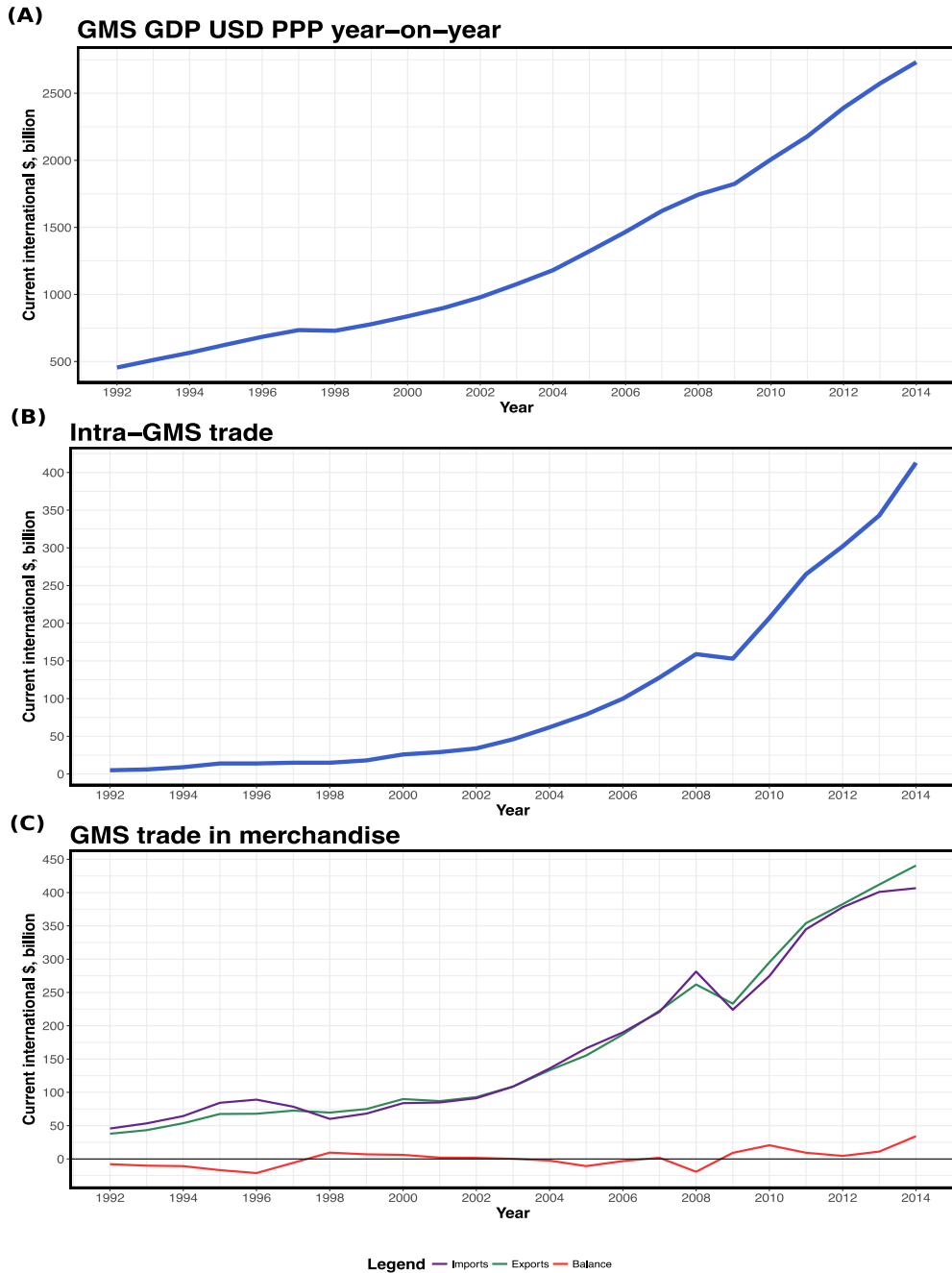
GDP = gross domestic product, GMS = Greater Mekong Subregion.

Note: Agriculture trade shares do not include Lao PDR, and for PRC, data are for the whole country and not for Yunnan and Guangxi.

Source: Annex Table A2.

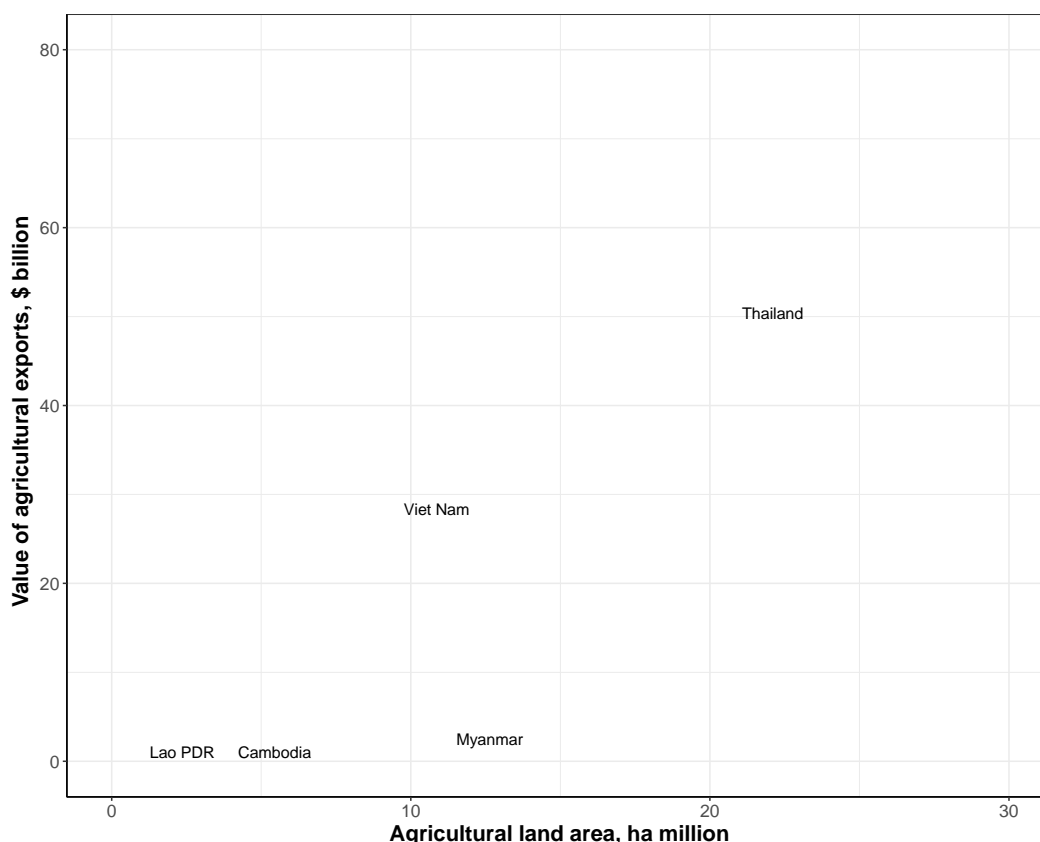
Current agricultural exports from the GMS countries show the discrepancies within the subregion (Figure 5). Intra-industry trade in the GMS is largely between the PRC, Thailand, and Viet Nam, indicating that CLM products are less-integrated into regional production networks. While there has been some rebalancing toward regional markets, the share of intra-GMS trade (except the PRC) remains low. Lowering trade barriers and facilitating trade within the GMS could have positive impacts, particularly for the CLM countries.

Figure 4: Greater Mekong Subregion GDP and Trade
 Figure 4a: Gross Domestic Product (\$ purchasing power parity, year-on-year)
 Figure 4b: Intra-GMS Trade, 1992–2014.
 Figure 4c: Trade in Merchandise



ADB = Asian Development Bank, GDP = gross domestic product, GMS = Greater Mekong Subregion, PPP = purchasing power parity.
 Note: scale of y-axis in Figure 3A differs from 3B and 3C.
 Sources: 4a: ADB staff estimates; ADB Statistical Database System (<https://sdfs.adb.org>); All PRC Data Center; and International Monetary Fund World Economic Outlook database, accessed October 2015. 4b: ADB Asian Regional Integration Center (ARIC) Integration database. 4c: ADB staff estimates; ADB Key Indicators for Asia and the Pacific, 2005 and 2015; and All PRC Data Center.

Figure 5: Value of Agricultural Exports versus Agricultural Land area, GMS except the People's Republic of China



ha = hectare, Lao PDR = Lao People's Democratic Republic.

Notes: The People's Republic of China autonomous regions of Guangxi and Yunnan are excluded because data are not available. Bubble scale (linear) indicates total value of agricultural exports.

Source: Data from Goletti (2016), FAO FAOSTAT (2017).

The GMS exports a diverse collection of food products to various markets. Exports from the CLM are dominated by raw products and low-value-added products. Rice is a major export item for Cambodia, Myanmar, Thailand, and Viet Nam; sugar and root crop products (cassava, arrowroot, and salep [orchid root flour]) are considerable exports for Cambodia and Thailand. Thailand exports large volumes of meat products, primarily poultry products. Viet Nam's coffee exports are currently more valuable than its rice exports; other major Vietnamese exports products include nuts, black pepper, starches, and inulin. The PRC exports vegetable products. The main export destinations include the other countries within the subregion, Canada, EU, Russian Federation, and US.

The main imports also vary between countries. The PRC, Thailand, and Viet Nam import large volumes of soybean, primarily for animal feed; the PRC and Myanmar import large amounts of palm oil and products derived from it; the PRC also imports considerable grain sorghum and barley; Myanmar imports substantial quantities of cereal grains and milk products; Thailand imports significant amounts of wheat and meslin; Viet Nam also imports corn, coconuts, Brazil nuts and cashew nuts, principally for further processing.

Rising Intra-GMS agricultural trade. Intra-GMS agricultural trade is expected to continue to increase, aided by the development of regional transport infrastructure, information and communication technology (ICT), and banking. The PRC, and to a much smaller extent Cambodia and the Lao PDR, are expected to remain net importers of agricultural goods and food products due to constraints on domestic production growth, population growth, and

rising incomes. In addition, integrated supply across borders is rising. Increasingly, upstream activities are conducted in lower-cost countries, notably Cambodia at present, and processing activities are done in countries with more established food manufacturing, such as Thailand and Viet Nam. For example, Thailand has become a considerable importer of lower-value raw agricultural products and exporter of food preparations. Some Thai conglomerates have expanded their upstream activities in neighboring countries. For example, Khon Kaen Sugar Industry, the largest publicly listed sugar manufacturer in Thailand, has invested in plantations and mills in Cambodia and the Lao PDR. Meanwhile, the company's investments in downstream facilities and value adding continue to operate in Thailand.

Looming non-foodborne challenges to GMS trade. The construction of multiple hydropower dams on the Mekong River and plans for further investments will affect ecosystems, irrigation, and land profiles in the GMS (Rasanen et al. 2017). The Mekong River is a cornerstone of livelihoods and food security for approximately 60 million people in the GMS; poor management of the Mekong could prove catastrophic.

Climate change is expected to cause a significant increase in average temperatures; southern inland Viet Nam, southern coastal and northern Myanmar, and almost all of Cambodia will experience an average maximum temperature rise by around 4 degrees Celsius according to data published by the GMS Core Environment Program of the Asian Development Bank (ADB). The impacts will be complex, but without increased adaptive capacity will likely include losses due to heat stress, altered dynamics of pests and diseases, and reduced yields and crop suitability (USAID 2014b, 2014a). Moreover, agricultural land area could diminish due to coastal erosion, rising sea levels, and land salinization—which will threaten to increase poverty, vulnerability, food insecurity, and urban migration.

Rising protectionism internationally may affect trade prospects (ADB 2016). The impacts of SPS Agreement and technical barriers to trade measures are now evident in virtually all global trade negotiations relating to agriculture products. While these measures are largely employed legitimately, overly stringent application of such measures can become unnecessarily onerous in terms of costs and delays, harming trade flows. The GMS countries joined Codex Alimentarius in the 1960s–1980s and became members of the WTO in the 1990s and early 2000s.

4. Drivers of GMS Food Safety and Market Access Initiatives

With increasing household incomes and greater access to information, regular food safety scandals have fueled consumer and government concern and impacted suppliers. Effective food safety systems across the GMS are crucial to protect consumers and industries and facilitate and diversify cross-border trade and investment in GMS agriculture.

Current foodborne hazards of importance to consumer health in the GMS include a wide variety of pathogens and chemical residues, such as antibiotics, hormones, pesticides, and heavy metals. Individual countries have suffered from specific food safety failures, such as melamine in the PRC and antibiotic and hormone residues in livestock and fishery products in Myanmar, Thailand, and Viet Nam. The nature of GMS agricultural supply is such that food safety issues in one country can readily affect its neighbors' domestic food supply.

4.1. Increasing burden of foodborne diseases

The economic costs of illnesses caused by foodborne diseases in the GMS have not been adequately estimated. However, direct healthcare costs and lost labor, tourism, and spending are undoubtedly a considerable economic drain. Although notoriously difficult to estimate, due to the lack of effective surveillance systems and underreporting, WHO (2015b) estimated that in South East Asia region, the annual burden of foodborne diseases includes more than 150 million illnesses, 175,000 deaths, and 12 million disability-adjusted life years.

The GMS countries suffer frequent outbreaks of foodborne illness, regular high-profile cases of food-related health scares, and continuing concerns about quality, notably misrepresentation of products (ProMED-mail 2016). Such concerns include foodborne pathogens and chemical residues in food products, primarily from plant protection agents and antibiotics. Furthermore, the presence of infectious agents and residues exceeding maximum residue limits in exports all too frequently results in costly rejections of GMS produce in international markets.

4.2. Scientific advances

The design, human resources, laboratories, and consumables for the technical and operational capacity of surveillance systems are improving throughout the GMS, but remain highly variable. Laboratories in the PRC, Thailand, and, to a lesser extent, Viet Nam have the capacity and resources to effectively implement technically challenging surveillance systems. However, the CLM's systems underperform due to insufficient expertise, infrastructure, and budget.

4.3. GMS trade in food

Cross-border food supply chains are now prevalent within the GMS and interest in export markets continues to grow. The development of common food safety standards benchmarked against international standards is a vital precondition for increasing GMS products' access to markets. Although the establishment of a common GMS food safety system is a long-term prospect, structures that could enable formation of such a system exist. For example, the Core Agricultural Support Program, Phase 2 (see section 5.4) and AEC strategic frameworks could enable and provide the impetus for GMS countries to develop harmonized food safety systems. At this juncture, a framework for monitoring and managing standards across a range of actors and national contexts is a necessary but challenging proposition.

4.4. Increasing presence of higher volume food supplies, additional processing and longer supply chains

The GMS food sector has undergone considerable concentration to achieve cost efficiencies and in response to growing urbanization, rising incomes, and increasing demand for processed food products. Large-scale production of processed food products, often with long shelf lives, complicates food safety risk management and emergency responses and risks widespread outbreaks of food-related illness. Longer supply chains and further processing increase the time from product preparation to consumption. Without adequate control, the longer supply chains and processing times increase the likelihood of

contamination or hazard multiplication. Furthermore, longer supply chains and increasing cross-border trade in raw and processed foods between GMS countries risks transmitting hazards across borders.

4.5. Consumer awareness and demand

In 2015, the middle class population of Asia and the Pacific surpassed that of the US and Europe combined. The GMS population has also become increasingly urbanized and better informed through new sources of information and greater connectivity. The changes have contributed to increasing consumer awareness of, and demand for, safety and quality assured food products (Kharas 2017).

4.6. Changing retailer requirements

As demand for processed foods in the GMS has increased considerably, food supply chains and retailing are evolving quickly. Increasing concentration and integration of food industries is apparent, with vertical integrators becoming more prevalent and influential. The number of supermarkets has proliferated. In this context, agricultural stakeholders in the GMS are under increasing pressure to demonstrate that their management of food safety risks is adequate to protect domestic consumers and meet customer requirements.

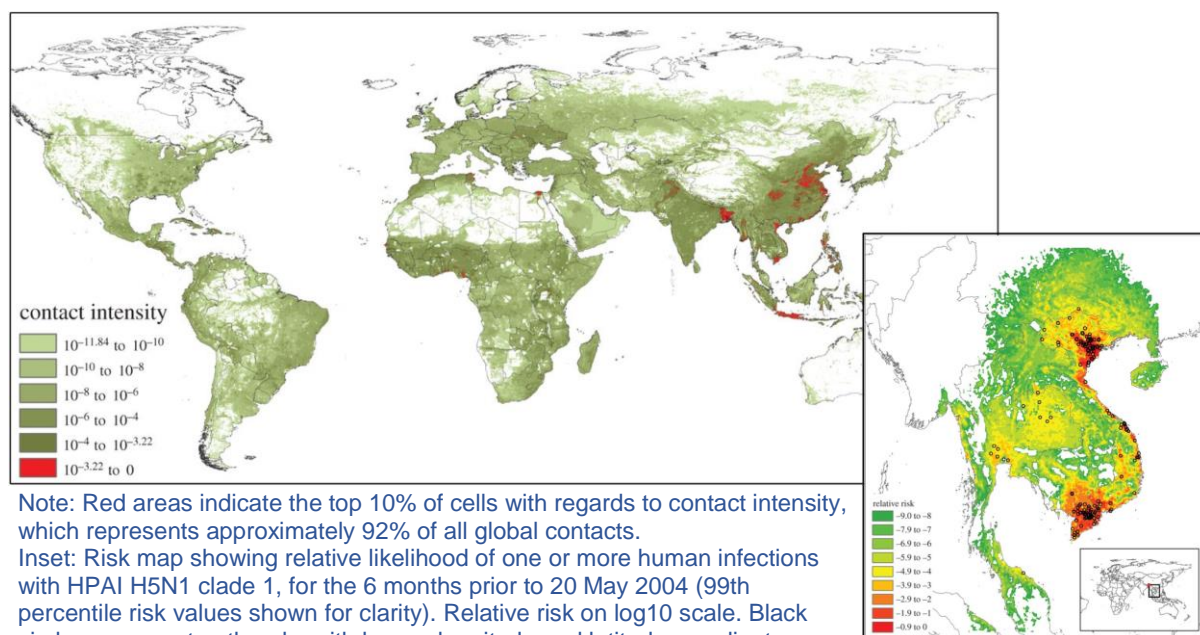
The rapid emergence of supermarkets across much of the GMS has also had a considerable impact on the subregion's food sector. The region's supermarkets have gained considerable power over suppliers, which is reflected in increasingly stringent requirements to provide a stable supply of good quality, safety assured, and appropriately packaged products. Voluntary standards supermarkets use to protect their reputations and differentiate themselves from (or match) competitors, can make it difficult for smallholders to engage with the supermarkets and can increase food waste.

4.7 Infectious diseases and other barriers to export

An estimated 75% of emerging infectious diseases in humans are zoonoses, and the GMS is among the highest risk areas in the world for emerging infectious disease events (Jones et al. 2008; Hill et al. 2015; Taylor et al. 2001). Emerging infectious diseases are significantly correlated with socioeconomic, environmental, and ecological factors. The relatively high human, livestock, and wildlife population densities in the GMS risk of a new or dormant pathogen emerging within the subregion. The rapid spread of the highly pathogenic avian influenza A H5N1 ("bird flu") and the high number of human cases in the GMS countries relative to elsewhere provides a compelling example of the rapid emergence and spread of an infectious pathogen in the subregion. Recent modeling by Hill et al. (2015) demonstrates that human–poultry contact rates are high in the GMS (Figure 6), which is also true for human contact with pigs, ruminants, and wild animals.

In addition, the high prevalence and frequent outbreaks of non-zoonotic pathogens and pests form barriers to trade. Examples include the foot and mouth disease virus and porcine reproductive and respiratory syndrome virus, and a multitude of pests. Such issues form barriers to accessing potentially lucrative markets under the terms of the SPS Agreement.

Figure 6: Normalized Contact Intensity Map for Domestic Chicken–Human Interaction across the Globe



Note: Red areas indicate the top 10% of cells with regards to contact intensity, which represents approximately 92% of all global contacts.
 Inset: Risk map showing relative likelihood of one or more human infections with HPAI H5N1 clade 1, for the 6 months prior to 20 May 2004 (99th percentile risk values shown for clarity). Relative risk on log10 scale. Black circles represent outbreaks with known longitude and latitude coordinates.
 Source: Hill et al. (2015).

5. Current Food Safety Policy, Investment, and Projects in the GMS

5.1. Current food safety policy landscape

Food safety is now prioritized in the policy agenda of each GMS economy. Each country has in place many of the requisite legislative and regulatory frameworks for food safety and quality assurance and has dedicated implementing agencies (Appendix Table A3). However, the less-developed economies lack sufficient food control systems, facilities, and technical and operational capacity.

Although in some cases commodity specific legislation is still required (Annex Table A4), national food safety policy and legislative and regulatory systems in the GMS countries have are now more comprehensive and aligned with the core principles and provisions of the ASEAN food safety policies and their associated frameworks (Table 3). This is an important step toward harmonizing GMS systems with internationally recognized food safety systems and requirements, replacing hazard-by-hazard approaches that hamper demonstration of equivalence between countries (Teoh 2016).

Table 3: Alignment of GMS Country Food Safety Policies and Frameworks with ASEAN Frameworks

| ASEAN Food Safety Legal Framework Provisions | Country Legal Framework | | | | | |
|--|--|---|---|--|---|--|
| | Cambodia | Lao PDR | Myanmar | Viet Nam | Thailand | PRC |
| ASEAN Food Safety Policy 2016 (AFSP) and its core principles^a | New Food Safety Law (draft #2, 2017) ^c | National Food Safety Policy 2009 ^e | National Food Law 1997; Amended National Food Law 2013; New Food Safety Law 2017 (for enactment) ^g | Law on Food Safety 2010 ^h | National Food Committee Act 2008 and National Strategic Framework for Food Management 2012 ^j | Food Safety Law 2015 ^k |
| Integrated Food Chain Approach | ✓ | ✓ | ✓ | ✓ | ✓ | ☐ |
| Systematic Risk Analysis Framework | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Science-Based, Independent Risk Assessment Process | ✓ | ☐ | ✓ | ☐ | ✓ | ✓ |
| Primary Responsibility of Food Business Operators | ✓ | × | ✓ | ✓ | ✓ | ✓ |
| Consistency with ASEAN Trade in Goods Agreement and WTO SPS and TBT agreements | ✓ | ☐ | ✓ | ✓ | ✓ | ☐ |
| Equivalence and Mutual Recognition | ✓ | ☐ | ✓ | ✓ | ✓ | × |
| Harmonization with International Standards | ✓ | ✓ | ✓ | ✓ | ✓ | ☐ |
| Reliable Traceability System | ✓ | × | ✓ | ✓ | ✓ | ✓ |
| Strengthening and Harmonization of Regional and National Food Control Systems | ✓ | ☐ | ✓ | ☐ | ✓ | ✓ |
| Transparency | ✓ | × | ✓ | ☐ | ✓ | ✓ |
| ASEAN Food Safety Regulatory Framework that operationalizes the AFSP (drafting stage in 2016)^b | Inter-Ministerial Prakas 868 on Implementation of Food Safety, 2010 ^d | MOH Ministerial Regulation 518, 2009 ^f | No counterpart | Food Safety and Agricultural Health Action Plan, 2006 ^g | National Strategic Framework for Food Management, 2012 ^j | National Food Safety Regulatory and Strategic Framework, 2007 ^l |

✓ = specified, ☐ = specified with some modifications, × = not specified, AFSP = ASEAN Food Safety Policy 2016, ASEAN = Association of Southeast Asian Nations, MOH = Ministry of Health, SPS = sanitary and phytosanitary, TBT = technical barriers to trade, WTO = World Trade Organization

Sources:

^a ASEAN (2016). ASEAN Food Safety Policy.

http://www.aseanfoodsafetynetwork.net/Food_safety_policy/bk/foodsafetypolicy/9f1er-2016-11-04.pdf

^b <http://asean.org/storage/2016/08/ASEAN-Food-Safety-Regulatory-Framework.pdf>

^c Personal communication, DDG Camcontrol, Cambodia.

^d http://www.camcontrol.gov.kh/userfiles/file/Inter-Ministerial%20Prakas%20no_%2020868_From%20farm%20to%20table%20for%20Food%20Safety_English%20Version_20101022.pdf

^e <https://laosfoodsafetylaws.files.wordpress.com/2011/03/laos-law-food-safety-13jan2009.pdf>

^f <https://laosfoodsafetylaws.files.wordpress.com/2011/03/laos-law-sanitary-technical-18mar2009.pdf>

^g <https://laosfoodsafetylaws.files.wordpress.com/2011/03/laos-law-sanitary-technical-18mar2009.pdf>

^h Zaw, T. 2015. Food safety in Myanmar. Symposium on Ensuring Food Safety: An Important Challenge Today. 30th CMAAO General Assembly & 51st Council Meeting, 23-25 Sept 2015, Yangon, Myanmar.

h

https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Food%20Safety%20Law%20and%20Guiding%20Decree%20Released_Hanoi_Vietnam_6-12-2013.pdf

ⁱ http://siteresources.worldbank.org/INTVIETNAM/Resources/vietnam_sps_report_final_feb_06.pdf

^j Thailand Food Committee. 2012. Strategic Framework for Food Management in Thailand.

^k http://tnfc.fda.moph.go.th/file/fileDoc/2015-04-20_5469.pdf

https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Amended%20Food%20Safety%20Law%20of%20China_Beijing_China%20-%20Peoples%20Republic%20of_5-18-2015.pdf

^l <https://www.adb.org/sites/default/files/project-document/65508/37599-prc-tcr.pdf> (ADB-TA completion report)

Current GMS food safety regulation derives primarily from either Codex Alimentarius or the national standards of other countries. The food control systems of the CLM and Viet Nam are founded on Codex Alimentarius. Countries with more developed food safety systems such as Thailand have national standards and regulations in place and measures are being taken to align these with the Codex Alimentarius and the ASEAN systems.

5.2. Roles and responsibilities and chains of command

Due to the multisector nature of food safety, multiple agencies are involved in implementing and enforcing food safety laws and food control systems; the key agencies vary between GMS countries (Annex Table A3). In all GMS countries except the PRC, the ministries of health and agriculture are among the main food safety agencies. Ministries of industry, trade and commerce, economy, and education have roles in food safety in the GMS countries. Support agencies include the ministries of industry, finance, commerce, interior, and university affairs, as well as the prime minister's offices. In many cases, inter-ministerial committees on food safety have been created to coordinate the activities of the different ministries, generally led by the ministry of health. The situation is somewhat different in the PRC, where two ministerial-level agencies are responsible for food safety—the Food and Drug Administration and the General Administration of Quality Supervision, Inspection and Quarantine.

National food safety agencies should work closely with local authorities and enforcement officers to ensure food laws are applied the entire length of food supply chains. In this situation, a clear chain of command is required for operating surveillance systems and emergency responses. Implementation and enforcement of food safety standards in less-developed countries have not yet reached the level of efficiency observed in the more-developed economies (e.g. Thailand), presenting an opportunity for the former to learn from the latter's experience.

5.3. Food safety and food control system infrastructure

Securing sufficient investment in food safety and food control systems is a major challenge in the GMS countries, particularly among the smaller economies. Nevertheless, GMS governments are making concerted efforts to strengthen their food safety capacity, often in coordination with development partners. For example, the ADB-supported project—Regional Trade Facilitation on Improved SPS Handling in GMS Trade—has financed the construction of infrastructure and capacity building in Cambodia, the Lao PDR, and Viet Nam. The project established enhanced surveillance and inspection systems for plant health, animal health, and food safety; improved training of specialists; and promoted regional cooperation and harmonization of SPS measures. Laboratory capacity in Myanmar has increased—including

establishing the first ISO/IEC 17025:2005² accredited laboratory (in Nay Pyi Taw), with support from the US-based ANSI-ASQ National Accreditation Board. In addition, a pharmaceutical chemistry laboratory is being developed by the United Nations Office for Project Services (UNOPS) and a food microbiology laboratory is being developed with support from the United Nations Industrial Development Organization (UNIDO); both will seek recognizable accreditation in 2017. More initiatives are discussed below.

5.4. Notable initiatives

Regional initiatives. Numerous ASEAN technical working groups are working on food safety, including the Prepared Foodstuff Product Working Group, the ASEAN Expert Working Group on Maximum Residue Limits of Pesticides, the ASEAN Task Force on Codex, the ASEAN Sectoral Working Group on Livestock, the ASEAN Sectoral Working Group on Fisheries, the ASEAN Sectoral Working Group on Crops, the ASEAN Working Group on Halal, the Ad-hoc Working Group on Food Irradiation, and the ASEAN Expert Group on Food Safety.

Donor-led initiatives. Several multicountry and national food safety initiatives have been implemented. The Mekong Institute and FAO have been the main implementers of multicountry projects, the former with funding from the New Zealand Aid Programme, the latter funded by the governments of Sweden and Japan. Other multicountry projects have been supported by ADB, the EU, GIZ,³ and the Asian Productivity Organization.

SPS and Codex Alimentarius initiatives have been pursued in CLM and Viet Nam (Annex Table A6). The FAO, with funding from the Japanese government, coordinates a multicountry capacity building project in the four countries, for developing and implementing international food safety standards. The FAO has also implemented projects in the Lao PDR, to assist the development of an SPS-related legal framework, and in Viet Nam, to strengthen SPS capacity more broadly. ADB also support SPS capacity building, primarily in Cambodia, the Lao PDR, Myanmar, and Viet Nam. In addition, the ADB-led GMS Core Agriculture Support Program and technical assistance address food safety and market access.

Private-sector-led initiatives. Many larger private interests in food systems have adopted or established their own more stringent requirements, based on standards such as ASEANGAP, good manufacturing practices, hazard analysis critical control point, and other international third party certifications that meet and often surpass national, regional, and global systems. A private-sector-led public–private partnership project to promote safe food and increased market access of small and medium-size enterprises (SMEs) is currently underway in Cambodia, the PRC, the Lao PDR, Myanmar, and Viet Nam.

Various regional and global private sector-driven initiatives address food safety and market access. The Global Food Safety Initiative (GFSI) is of particular note. The GFSI is a non-profit foundation supported by a number of the world's leading food retailers who, in collaboration with UNIDO, share technical expertise with SMEs to build their compliance with international food safety standards. The GFSI currently has several initiatives in the GMS.

The participatory guarantee system (PGS) offers a community-based quality assurance system for the supply of food products produced using organic agriculture methods. The

² ISO/IEC = International Organization for Standardization and International Electrotechnical Commission.

³ Deutsche Gesellschaft für Internationale Zusammenarbeit, GmbH

approach is participatory and peer-based, certifying groups of producers on the basis of trust, social networks, and knowledge exchange between peers. PGS initiatives are serving thousands of small-scale organic farmers and their consumers globally, and their numbers are increasing annually. A PGS is typically initiated by the private sector with minimal government support. Approximately 50 PGS groups are now operating in the GMS, with more than 2,500 participating farmers, mainly in Thailand and Viet Nam.

5.5. Notable Gaps

Despite the heavy burden of foodborne hazards on the GMS countries, their capacity for managing food safety risks remains suboptimal. Issues include infrastructure bottlenecks; variable and often limited technical capacity; and uncertain leadership, roles, and responsibilities. The effective control of hazards in all GMS countries is of paramount importance to each country given the increasing volumes of cross-border trade in food products.

Policy and institutional gaps hamper subregional harmonization. Creating a policy environment for enabling food safety in the agri-food industry is a prerequisite to realizing the sector's potential to boost economic growth, reduce poverty and inequality, provide food security, and deliver environmental services (World Bank 2017). Government policies and regulations play a key role in shaping the business environment through their impacts on costs, risks, and barriers to competition for various players in value chains. By setting the right institutional and regulatory framework, governments can help increase the competitiveness of farmers and agricultural entrepreneurs, enabling them to integrate into regional and global markets.

Surveillance systems. Considerable variability exists in the design and implementation of surveillance systems. Furthermore, GMS country standards, such as national GAPs differ, and equivalence is not yet recognized for technical and political reasons. At present, internationally recognized risk management approaches are generally confined to the few larger processors or export-oriented suppliers.

Policies, laws, and regulation. The GMS countries have national food safety policies and laws. These may include sector- or commodity-specific legislative and/or regulatory systems, for example veterinary and rice laws. However, systems are poorly coordinated and lack coherence in some jurisdictions.

Regulatory systems are often opaque and can be unnecessarily burdensome. Transparency and accountability is highly variable. Excessive regulation can also drive suppliers and producers to use informal means to reduce costs, presenting greater risk to all. Poorly designed or enforced regulations can impose unnecessary transaction costs and hamper productivity and access to finance, for example.

Information dissemination. Considerable information gaps exist, such as estimates of the prevalence of key hazards, consumption volumes, and consumer behavior. Research institutes and the private sector are not adequately engaged in the setting of standards, guidelines, and policy and regulatory systems. Yet, these stakeholders are essential to developing systems that function effectively.

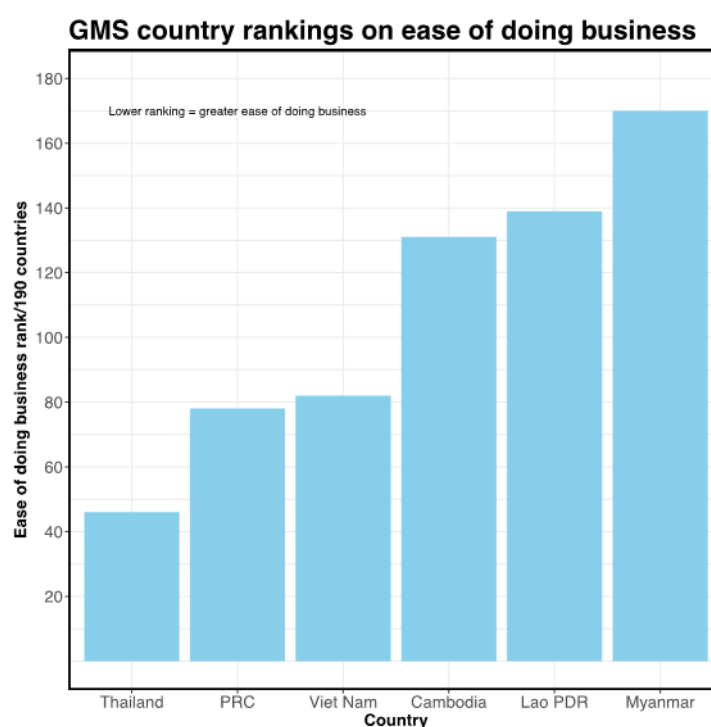
5.6. Ease of doing business

The terms and conditions for conducting business in the GMS could be improved. The situation varies across the region. In particular, the CLM faces considerable difficulty in mainstreaming food control systems due to unfavorable business conditions (Figure 7). Improvements needed include facilitation of legal cross-border trade, business start-ups, enforcement of contracts, access to electricity, and protection of minority investors. While the GMS countries have made considerable advances in expediting border transit for goods, primarily through reduced documentation and broader streamlining, there are considerable opportunities for further increasing the efficiency. GMS countries can learn from each other and other ASEAN nations by understanding their policies, institutional capacity, and infrastructural investment for creating conditions that support all business ventures, including SMEs.

Investment gaps in food supply chains and food controls. Current gaps in food safety and market access investment in the GMS are apparent the length of agriculture value chains. Infrastructure gaps create bottlenecks in food supply systems in the GMS. Specific infrastructure needs vary between and within countries, between products, and at different points in supply chains.

Investment is required in developing safer, higher quality, more transparent input supply (including seed, plant protection, and feed), and in regulating the use of veterinary products in animals destined for the market. In production, further investment in on-farm surveillance systems is needed. Moreover, better communication of best practices and risk mitigation and risk management strategies is needed.

Figure 7: GMS Country Rankings for Ease of Doing Business (out of 190 countries)



GMS = Greater Mekong Subregion, Lao PDR = Lao People's Democratic Republic,
PRC = People's Republic of China.
Source: Data from World Bank (2017).

Post farm gate, process control systems are in their infancy in some GMS countries and vary widely between large and small-scale processors. Again, best practices, assurances, and risk communication initiatives are needed. Ease of transport and the capacity and quality of storage vary widely across the GMS. Transport is hampered by improving but still suboptimal requirements for movement within countries and across borders. Investments in expediting consignment movement by further reducing red-tape, increasing the availability and quality of cold chains, providing transport hub services such as weighing stations and truck parking, and improving access to deep-sea ports can reduce losses in transit and minimize the likelihood of waste and of contamination and multiplication of hazards in products.

Retailers' food handling may be improved by better practices and by risk communication initiatives. Promoting safe consumer steps in handling and preparing food is also needed. Finally, systems to alert stakeholders of food safety and other hazard risks are generally underdeveloped. Systems for identifying a problem early and addressing it via alerts, product recalls, movement bans, vaccination campaigns, culling, and the like, are required.

Additionally, food testing laboratories and transport and logistics related infrastructure are typical infrastructural gaps. The few food testing laboratories in the GMS lack international accreditation. Some GMS countries do not have laboratories that meet international standards for detecting key hazards. As a result, suppliers either remain uncertified or must send samples outside their country, thus incurring additional expense and considerable opportunity costs and potential waste. Other key gaps include disease control infrastructure, such as quarantine facilities.

Human and operational capacity, and business environment. The common constraints in the CLM are technological and relate to human resource skills, technical training, and surveillance and traceability systems. Viet Nam also suffers from deficient technical capacity and underperforming or nonexistent traceability systems. The enforcement of food laws, occurrence of forgeries, and poor value chain coordination also hamper food safety throughout the GMS. Improper processing, inefficient use of natural resources (including overfishing and waste dumping in rivers), and GMS suppliers' and public authorities' uncertainty on the responsibility for protecting consumers and the environment also negatively impacts food safety. SMEs' limited interest in applying food safety management systems, associated with suboptimal policies and uncertain incentive structures, are particularly apparent in the CLM. Improper use of agrichemicals is exacerbated by the failure of pesticide companies to provide recommendations on the optimal use of their products, which is particularly notable in Myanmar. Delays in customs processing also contribute to difficulties encountered. A key Thai constraint is insufficient support for food businesses that mainstream food safety management systems, which is not yet adequately rewarded in the domestic market. Limited value addition in various food chain segments could be addressed to increase competitiveness and improve the safety and quality of food products for national and export markets.

Effective risk management requires considerable leadership, technical, and operational capacity, which is currently highly variable within the GMS. Current chains of custody for sample handling and chains of command in decision making related to risk management initiatives need clarification and harmonization.

Capacity to effectively implement risk analysis remains limited. Surveillance systems vary in design, implementation, and reliability; ICT systems are suboptimal; and harmonization and adoption of standards and technical regulations frequently suffer delays. Most traceability systems require considerable upgrading. The main technical constraints are commonly amplified by a lack of coordination with universities and research institutes and insufficient knowledge transfer about food safety risk management. This is the case across the GMS,

including Thailand, where the technical capacity in food control systems is considerably more advanced than in the other countries.

Emergency response plans for food safety hazards, zoonosis, and broader infectious diseases of importance to production and trade are at various stages of development, as is the capacity of different countries to implement such responses in a timely, efficient, and effective manner. Given national interests in controlling hazards and the porous nature of GMS borders, there are opportunities to harmonize emergency response plans at the subregional level.

Effective food systems require considerable maintenance and operating budgets. To cover the costs will also require inputs from all stakeholders. For example, surveillance and traceability systems inevitably require continuing investment in staff, vehicles and fuel, consumables, data management, and broader information and communication technology services. Furthermore, risk communication is an essential component of risk analysis related to both food safety and hazards of importance to trade. Data sharing and risk communication initiatives within and between GMS countries can be improved. To be effective, awareness raising initiatives on priority hazards, risks, and best practices for risk mitigation must be dynamic, timely, and targeted to consumers, retailers, and suppliers.

6. The Way Forward

Although the GMS countries have made progress in developing appropriate food safety policies, establishing risk-based surveillance systems, upgrading food safety systems, and facilitating trade, further improvements are desirable. To develop more credible and robust systems that build trust will require (1) reliance on evidence-based national and regional policy, legislative, and regulatory environments and systems; and (2) strategic investment in infrastructure and human and operational capacity. Furthermore, risk communication initiatives can be strengthened to build risk awareness among stakeholders and facilitate optimal responses.

Addressing gaps related to food safety standards and hazards of importance to trade in agricultural products in the GMS requires holistic value chain approaches that include all stakeholders. Strengthening risk-based approaches can upgrade food safety systems and help to unlock market access in a cost-effective manner. Effective implementation will also increase transparency and accountability of food safety measures, which can increase trust between customers, suppliers, and regulators.

Food control systems in the GMS can be improved by greater aligning them with the regional standards. The ASEAN Common Principles for Food Control Systems (ASEAN 2015) provides a guide for developing and harmonizing food control systems across the GMS. The key principles include integrated farm-to-table approaches, risk analysis, transparency, and regulatory impact assessment. Strategic evidence-based policymaking, institutional capacity building, and investment are needed to achieve the goals of the principles.

The accompanying discussion paper—Increasing the Safety and Quality of Food Products from the Greater Mekong Subregion—specifically assesses gaps and recommends actions and short-term initiatives to improve GMS food safety systems and increase market access for GMS food suppliers.

Annex

Table A1: Definition of Key Terms

| Term | Definition |
|---------------------------|--|
| Burden of disease | Combines quantification of morbidity, disabling complications such as long-term sequelae, and mortality. Typically expressed in the summary figure disability-adjusted life years (DALYs). The DALY is a “health gap measure that combines the years of life lost due to premature death (YLL) and the years lived with disability (YLD) from a disease or condition, for varying degrees of severity, making time itself the common metric for death and disability. One DALY equates to one year of healthy life lost” (Havelaar et al. 2015). |
| Foodborne disease | A disease commonly transmitted through ingested food. Comprises a broad group of illnesses, and may be caused by microbial pathogens, parasites, chemical contaminants, and biotoxins (Havelaar et al. 2015) |
| Food defense | The Food Protection and Defense Institute defines food defense as “the sum of actions and activities related to prevention, protection, mitigation, response, and recovery of the food system from intentional acts of adulteration. This includes intentional adulteration from both terrorism and criminal activities. Criminal activities include economically motivated adulteration, as well as acts by disgruntled employees, consumers, or competitors intending to cause public health harm or business disruption.” (FPDI 2017). |
| Food protection | A term that combines both food safety and food defense. |
| Food safety | Refers to the prevention of consumer exposure to foodborne hazards, which may be biological, chemical, or physical in nature. |
| Hazard | The European Commission Scientific Committee for Food (1997) defined a foodborne hazard as a ‘biological, chemical or physical agent in food, or condition of food, with the potential to cause adverse health effects.’ For these purposes risk is defined as a combination of the likelihood of an adverse health effect on pigs and/or humans and the severity of the effect as a consequence of the hazard (Manning and Soon 2013). |
| Risk | A combination of the likelihood of an adverse health effect and the severity of the effect as a consequence of the hazard (Manning and Soon 2013). |
| Risk analysis | Refers to the development of an understanding of risk in a given context (Manning and Soon 2013). The process of risk analysis comprises hazard identification, risk assessment, risk management, and risk communication (ISO 2009). |
| Risk assessment | The evaluation of the likelihood and the biological and economic consequences of entry, establishment, or spread of a pathogenic agent within the territory of an importing country. |
| Risk communication | The interactive exchange of information on risk among risk assessors, risk managers, and other interested parties. |
| Risk management | The process of identifying, selecting, and implementing measures that can be applied to reduce the level of risk. |
| Zoonosis | Any disease or infection that is naturally transmissible from animals to humans (OIE 2016). |

Table A2: GDP and Trade Scenarios in GMS Countries

| Particulars | Cambodia | PR China | Lao PDR | Myanmar | Thailand | Viet Nam |
|--|----------|-----------|---------|---------|----------|----------|
| GDP (billion current \$, 2015) | 18.05 | 10,866.44 | 12.33 | 66.98 | 395.28 | 193.60 |
| GDP per capita (\$, 2012–2015) | 1,093 | 7,503 | 1,756 | 1,203 | 6,003 | 2,024 |
| Trade per capita (\$, 2012–2015) | 771 | 1,677 | 557 | 220 | 3,918 | 1,756 |
| Trade (% GDP, 2012–2015) | 70.5 | 22.3 | 31.7 | 18.9 | 65.3 | 86.7 |
| Commodity exports (billion current \$, 2014–2015) | 11.96 | 2,274.95 | 2.34 | 5.95 | 214.38 | 162.11 |
| Agricultural products (%) | 4.9 | 3.2 | ND | 26.5 | 17.0 | 15.2 |
| Fuel and mining products (%) | 0.1 | 2.4 | ND | 43.8 | 5.0 | 3.4 |
| Manufactures (%) | 66.1 | 94.3 | ND | 29.5 | 74.6 | 81.4 |
| Others (%) | 28.9 | 0.1 | ND | 0.3 | 3.4 | |
| Main export destinations (%, 2010–2015) | | | ND | | | |
| EU | 38.5 | 15.6 | | | 10.3 | 18.6 |
| US | 25.0 | 18.0 | | | 11.2 | 19.1 |
| Japan | 6.7 | 6.0 | | | 9.4 | 9.8 |
| Canada | 6.5 | | | | | |
| Hong Kong, China | | 14.6 | | 21.1 | | |
| Thailand | | | | 41.7 | | |
| India | | | | 12.6 | | |
| PRC | | | | 6.2 | 11.1 | 9.9 |
| Others | 23.3 | 45.8 | | 18.4 | 58.1 | 42.6 |
| Top agricultural exports (million \$, 2010–2014) | | | ND | | | |
| Rice | 231 | | | 156 | 4,544 | 2,937 |
| Sugar (cane or beet) | 28 | | | | 2,628 | |
| Cassava, arrowroot, salep | 23 | | | | 1,543 | |
| Cigars, cheroots, cigarillos | 16 | | | | | |
| Preparations of a kind used in animals | 15 | 1,599 | | | 1,214 | |
| Dried vegetables, whole or cut | | 2,812 | | | | |
| Plants' parts otherwise preserved | | 2,572 | | | | |
| Onions, shallots, garlic, leeks | | 2,385 | | | | |
| Other vegetables, not frozen | | 1,878 | | | | |
| Dried leguminous vegetables | | | | 890 | | |
| Other oil seeds, oleaginous fruit | | | | 69 | | |
| Meat and edible meat offal, salted | | | | 16 | | |
| Other prepared or preserved meat | | | | | 2,187 | |
| Maize (corn) | | | | 12 | | |
| Coffee | | | | | | 3,311 |
| Coconuts, Brazil nuts, cashew nuts | | | | | | 2,050 |
| Pepper of the genus Piper | | | | | | 1,206 |
| Starches, inulin | | | | | | 739 |
| Commodity imports (billion current \$, 2015) | 14.40 | 1,681.95 | 3.86 | 15.92 | 202.65 | 166.10 |
| Agricultural products (%) | 7.3 | 9.5 | ND | 4.9 | 7.9 | 11.2 |
| Fuel and mining products (%) | 1.7 | 21.3 | ND | 12.3 | 18.5 | 8.0 |
| Manufactures (%) | 60.8 | 64.4 | ND | 75.1 | 69.6 | 75.0 |
| Others (%) | 30.2 | 4.8 | ND | 7.6 | 4.0 | 5.7 |
| Main import origin (%, 2010–2015) | | | ND | | | |
| PRC | 36.8 | | | 27.1 | 20.3 | 29.5 |
| Thailand | 14.6 | | | 11.4 | | |
| Viet Nam | 8.7 | | | | | |
| Hong Kong, China | 6.7 | | | | | |
| EU | | 12.4 | | | 8.9 | |
| Korea | | 10.4 | | 6.1 | | 14.7 |
| US | | 9.0 | | | 6.9 | |
| Singapore | | | | 27.0 | | |
| Taipei, China | | 8.6 | | | | 7.5 |
| Japan | | | | | 15.4 | 8.7 |

| Particulars | Cambodia | PR China | Lao PDR | Myanmar | Thailand | Viet Nam |
|---|----------|----------|---------|---------|----------|----------|
| Others | 33.2 | 59.6 | | 28.1 | 48.5 | 39.6 |
| Top agricultural imports (million US\$, 2010-2014) | | | ND | | | |
| Cigars, cheroots, cigarillos | 395 | | | | | |
| Malt and malt extract | 169 | 2,896 | | 8.4 | | |
| Preparations of a kind used in animals | 101 | | | | | |
| Waters containing sugar | 72 | | | | | |
| Soybeans | | 34,895 | | | 1,117 | 873 |
| Solid residues from soyabean mill | | | | | 1,235 | 1,860 |
| Palm oil and its fractions | | 3,705 | | 168 | | |
| Grain sorghum | | 2,971 | | | | |
| Barley | | 2,859 | | | | |
| Cereal grains otherwise worked | | | | 58 | | |
| Milk and cream, concentrated | | | | 49 | | |
| Other food preparations | | | | 16 | 517 | |
| Wheat and meslin | | | | | 1,132 | |
| Cotton, not carded or combed | | | | | 532 | 1,423 |
| Maize (corn) | | | | | | 1,216 |
| Coconuts, Brazil nuts, cashew nuts | | | | | | 651 |

EU = European Union, GDP = gross domestic product, Lao PDR = Lao People's Democratic Republic, ND = no data, PRC = People's Republic of China, US = United States.

GDP is the sum of output within the economy's territory minus the sum of intermediate consumption (increased by taxes net of subsidies on products). It is measured in nominal terms and with market exchange rates; GDP per capita is estimated as an economy's GDP divided by the population. It is calculated on the basis of data for the three latest years available; Trade per capita is estimated as an economy's trade in goods and commercial services (average of exports and imports, balance of payments basis) divided by the population. It is calculated on the basis of data for the three latest years available; Trade to GDP ratio is estimated as an economy's trade in goods and commercial services (average of exports and imports, balance of payments basis) divided by GDP, on the basis of data for the three latest years available; Agricultural products refer to food and raw materials; Fuels and mining products include ores and other minerals, fuels and non-ferrous metals; Manufactures refer to iron and steel, chemicals, other semi-manufactures, machinery and transport equipment, textiles, clothing and other consumer goods. Please note that due to the products not classified in the three main product groups, the sum of the shares may not add up to 100; Agricultural products, top exported products and top imported products are the top five traded agricultural goods of an economy at the HS 4-digit level. According to the definition of the WTO Agreement on Agriculture, agricultural goods refer to HS chapters 1 to 24 (excluding fish and fish products) and a number of manufactured agricultural products (for further information, see "The Legal Texts: The Results of the Uruguay Round of Multilateral Negotiations," WTO). This definition does not correspond to the definition of agricultural products above;

Source: WTO (2016).

Table A3: Food Safety Laws, Regulations, and Implementing Agencies in the GMS

| Country | Laws and Regulations | Agencies and main functions |
|------------------------------------|--|---|
| Cambodia | <p>Law on the Management of Quality and Safety of Products and Services (2000) Covers inspection procedures to ensure quality and safety of products, goods, and services as well as guidelines on production and commercialization, consumers' rights and economic operators' obligations, labeling, commercial fraud repression, etc.</p> <p>Law on Standards of Cambodia (2007) Seeks to improve the quality of products and services to (1) raise production efficiency, (2) ensure fair and simplified trade, (3) rationalize product use, and (4) enhance consumer protection and public welfare.</p> <p>Law on Management of Pesticides and Fertilizers (2012) Aims to enhance public awareness of the implementation of standard requirements of pesticides and fertilizers .</p> <p>Prakas on Good Agricultural Practices (2010) Promotes good agricultural practice (GAP) rules on fruit and vegetable production to promote food safety; minimize environmental impact; protect health, safety, and well-being of producers; and improve the quality of agro-products.</p> <p>Prakas on the Implementation and Institutional Arrangements of Food Safety Based on the Farm-to-table Approach (2010) Aims to improve the implementation of a food safety system that will protect consumer health, enhance Cambodian food export competitiveness, and set up institutional arrangements.</p> | <p>Ministry of Agriculture, Forestry and Fisheries—Takes charge of the registration and/or permission to establish and operate food business at primary production and primary processing will be carried out by the Ministry's Competent Authority.</p> <p>Ministry of Industry and Handicraft—Monitors food safety compliance of large-scale production of processed food products and handicrafts especially those for export.</p> <p>Ministry of Commerce, General Department of CAMCONTROL—Ensures consumer protection, implement a framework for cross-border market surveillance activities, work on custom-related services with General Department of Customs and Excise of Cambodia (GDCE) and other concerned agencies, and lead the inter-ministerial committee on food safety.</p> <p>Ministry of Health—Implements policies and programs promoting compliance to hygiene and sanitation requirements</p> <p>Ministry of Economy and Finance, GDCE—provides effective and efficient coordination in food safety inspection at the international checkpoint</p> |
| China, People's Republic of | <p>Food Safety Law 2009 (repealed Food Hygiene Law 1997)</p> <p>Revised Food Safety Law 2015, imposing more stringent controls on food safety risks and ensuring greater government accountability towards consumers.</p> <p>Food and Drug Administration Law 2013, establishes FDA Drug Administration Law 2001</p> | <p>Food and Drug Administration (FDA), a ministerial level agency,</p> <ul style="list-style-type: none"> • is responsible for food safety management, risk assessment, formulation of standards, information dissemination, establishment of codes of practice for food testing organizations, and the investigation of major food safety incidents; • oversees food manufacture, distribution and consumption, and manages regulation processes for food and drug safety; and • works closely with the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ) <p>AQSIQ is a ministerial-level agency under the PRC State Council that is in charge of national quality, metrology, entry-exit commodity inspection, entry-exit health quarantine, entry-exit animal and plant quarantine, import-export food safety, certification and accreditation, standardization, as well as administrative law enforcement</p> |

| Country | Laws and Regulations | Agencies and main functions |
|---|---|--|
| Lao People's Democratic Republic | National Food Safety Policy (2009) Aims to protect and promote better health by ensuring people consume safe, hygienic, and nutritious food as well as promote safe food production and trade. | Ministry of Health (MOH)—Develops national food safety plans and policies and coordinates intersectoral linkages in implementing regulations. Ministry of Agriculture and Forestry—Monitors food safety practices from primary production, processing, and preservation; implement codes of practices. Ministry of Industry and Commerce—Inspects factories and other industrial establishments. |
| | Food Law (2013) Defines the principles, regulations, and measures to manage, monitor, and inspect food and food businesses ensuring quality, effectiveness, safety, and nutrition as well as protecting consumers' health and contributing to the country's development. | |
| | Food Inspection Regulation 297, MOH (2012) Provides guidelines in food inspection | |
| Myanmar | National Food Law (1997) Regulates production, import, export, storage, distribution, and sale of food; enables public to consume food of genuine quality and free from danger. | Ministry of Health and Sports, Department of Food and Drug Administration—In charge of the registration, licensing, and quality control of registered drugs, processed food, and food for import/export. Ministry of Agriculture, Livestock, and Irrigation, Department of Agriculture—Promotes GAP and regulates use of chemical inputs in agricultural products. Ministry of Education, Department of Research and Innovation—Ensures compliance with international standards and regulations. Ministry of Commerce, Department of Consumer Affairs—Establishes consumer dispute settlement groups at regional, state, and township levels. |
| | Consumer Protection Law (2015) Seeks to protect rights of consumers by forming Consumer Complaint Committee to receive complaints regarding food quality and safety. | |
| | Public Health Law (1972) Aims to control the quality and cleanliness of food and drugs, maintain environmental sanitation, and prevent epidemics. | |
| | Pesticide Law (1990) Regulates the use and trade of pesticides and other toxic substances. | |
| Thailand | <p>Note: abbreviations in this column are defined in the column to the right.</p> <p>Agricultural Commodity Standards Act BE2551 (2008)—ACFS Fertilizer Act BE2518 (1975) amended 2550 (2007)—DA Plant Quarantine Act BE2507 (1964) amended 2551 (2008)—DA Fisheries Act BE2490 (1947)—DF Control of Animal Slaughter & Sale of Meat Act BE2535 (1992)—DLD Animal Feed Quality Control Act BE2525 (1982) amended 2542 (1999)—DLD Animal Epidemics Act BE499 (1956) amended 2542 (1999)—DLD Dairy Cattle and Milk Product Act BE2551 (2008)—DLD</p> | Ministry of Agriculture and Cooperatives (MAC)—Responsible for safety and quality of food at farm production for domestic and export market and food (fresh and processed) through standard setting and control of using the standard; controls import of living plants and animals, meat, tuna, shrimp, animal feed, agro-chemicals and agro-hazardous substances. MAC includes the <ul style="list-style-type: none"> • -National Bureau of Agricultural Commodity & Food Standard (ACFS) • -Dept of Agriculture (DOA) • -Dept of Fisheries (DOF) • -Dept of Livestock Development (DLD) • -Dept of Rice (DOR) • -Dept of Agricultural Extension (DAE) |
| | Food Act BE2522 (1979) (FDA) Communicable Disease Act BE2523 (1980) (DDC) Public Health Act BE2535 (1992) (DH) | Ministry of Public Health (MPH)—Responsible for safety and quality of food (fresh, processed, and cooked) and import of food for domestic consumption through standard setting and control of using the standard of food, labeling, advertisement and its packaging; consumer education; foodborne disease prevention and control for both domestic |

| Country | Laws and Regulations | Agencies and main functions |
|------------------------|---|--|
| | <p>Natl Food Commission Act BE2551 (2008) (ACFS & FDA)</p> | <p>and export food. MPH includes the</p> <ul style="list-style-type: none"> • -Food and Drug Administration (FDA) • -Food Safety Operations Center (FSOC) • -Dept of Health (DH) • -Dept of Medical Sciences (DMS) • -Dept of Disease Control (DDC) • -National Food Commission (NFC). <p>NFC is responsible for the formulation of national policy direction and strategies covering all dimensions of food, which includes food quality, food safety, food security, and food education. All policies and strategies will guide all national agencies throughout the food chain to move in the same direction, to have more coordination and integration in order to achieve the highest possible level of national food management.</p> |
| | <p>Industrial Product Standards Act BE2511 (1968) amended 2548 (2005)—TISI National Standardization Act BE2551 (2008)—TISI Hazardous Substances Act BE2535 (1992) amended 2544 (2001)—MI Hazardous Substances Act BE2535 (1992) amended 2544 (2001)—MI Export and Import of Goods Act BE2522 (1979)—DFT Consumer Protection Act BE2522 (1979) amended 2541 (1998)—OCPB Liability for Damages Arising from Unsafe Products Act BE2551 (2008)—NHC National Health Act BE2550 (2007)</p> | <p>Support ministries:</p> <ul style="list-style-type: none"> • Ministry of Industry (MI)—Thai Industrial Standards Institute (TISI), standards; National Food Institute (NFI), upgrading food industry to international standard, lab services, R&D; • Finance and Trade (DFT)—Customs Dept-coordinates with FDA at major ports for import test; • Commerce—Foreign Trade Dept-controls import/export of controlled goods • Interior—with provincial governors as head of food safety activities at local level; • University Affairs—Knowledge Network Institute of Thailand and Institute of Nutrition, Mahidol University – R&D • Prime Minister’s Office—Consumer Protection Board-OCPB; • National Health Commission (NHC). |
| <p>Viet Nam</p> | <p>Food Safety Law (2010) Outlines conditions for food safety from food production, testing, labeling, trading, and consumption.</p> <p>Decree No.163/2004/ND-CP (2004) Regulates the implementation of some articles of the Ordinance on Food Hygiene and Safety in detail.</p> <p>Decree No.79/2008/ND-CP (2008) Stipulates the organization, management, inspection, and testing of food hygiene and safety system.</p> <p>Resolution No. 34/2009/NQ-QH12 (2009) Promotes the implementation of policies and legislation on the management of food quality, hygiene, and safety.</p> <p>Decree No. 38/2012/ND-CP (2012) Guides interagency coordination to implement the Food Safety Law.</p> | <p>Ministry of Health (MOH)- manage food safety from production, processing, and retail of pre-packed and processed food, food additives, and other substances</p> <p>Ministry of Agricultural and Rural Development (MARD) - monitor food safety compliance on cereals, egg, meat, seafood, fruits, vegetables and other related by-products and produce</p> <p>Ministry of Industry and Trade (MOIT) - regulate production, processing, and retail of alcoholic beverages, processed milk, vegetable oil, etc</p> |

Source: Mekong Institute data.

Table A4a: Gaps along the Food Chain in the GMS

| Stage | Gaps | Cambodia | China, PR | Lao PDR | Myanmar | Thailand | Viet Nam | |
|--|---|--------------------------------------|-----------|---------|---------|----------|----------|--|
| Input supply | Lack of quality inputs, especially seeds | √ | | | √ | | | |
| | Lack of seed storage facility | | | | √ | | | |
| | No plant variety protection | | | | √ | | | |
| | Contamination of animal feed | | | | | √ | | |
| | Limited access to capital to acquire inputs | | | | √ | | | |
| Production | Lack production and marketing plan; no system | | √ | | | √ | | |
| | Misuse of pesticides, hormones, antibiotics, fertilizers | √ | √ | √ | √ | √ | √ | |
| | Limited capacity on proper production (integrated pest management, good agricultural practices, irrigation, food safety control, optimum input use) | √ | | √ | √ | √ | √ | |
| | Low quality downstream water | | | | | √ | | |
| | Heavy metal pollution of soils | | √ | | | | | |
| | Waste from industries near farms | | √ | | | | | |
| | Weak food safety inspection; no border quarantine | √ | | | | | | |
| | High production cost and difficulty in farm supervision | | √ | | | | | |
| | Low incentive to apply food safety control | | | √ | | | | |
| | Small-scale, scattered, seasonal production | | √ | | √ | √ | √ | |
| | Lack of affordable credit | | | | √ | | | |
| | Processing | Misuse/illegal use of food additives | √ | √ | | | | |
| | | High energy and freight cost | √ | | | | | |
| High postharvest losses | | √ | | | √ | | | |
| Limited knowledge and capacity; insufficient science and technology inputs | | √ | √ | √ | √ | | √ | |
| Limited support to small and medium enterprises to upgrade processing | | √ | | √ | | | | |
| Lack of processing facilities and limited processed items | | | | | √ | | | |
| Lack of interest to apply food safety standards | | | | √ | | | | |
| Lack of accrediting organizations for export foods | | | | | √ | | | |
| Lack of control over small processors | | | | | | | √ | |
| Lack of responsibility to protect consumers and the environment | | | | | | √ | | |
| Loss of public confidence on regulatory system | | | √ | | | | | |
| Storage and transport Retail | High cost of transport/logistics | √ | | | √ | | | |
| | Lack of facilities for proper temperature control | √ | √ | √ | √ | √ | √ | |
| | Lack of technical knowledge | √ | | √ | √ | | | |
| | Underdeveloped distribution | | | | | | √ | |

| | | | | | | | |
|------------------------|---|---|---|---|---|--|---|
| | channel | | | | | | |
| | Lack of food safety and hygiene capacity | √ | √ | √ | √ | | √ |
| Retail Consumer | Lack of incentive to apply food safety regulations | | | √ | √ | | |
| | Lack of responsibility to ensure food safety | | | √ | | | |
| | Lack of systematic data storage and analysis | | √ | | | | |
| | Lack of awareness of food safety and good practices | √ | √ | √ | | | |
| | Lack of representation of consumer organization | √ | | | | | |
| Consumer | No national consumer protection committee | | | | √ | | |
| | Lack of differentiated products | | | | | | √ |
| | Lack of effective and trusted certification | | | | | | √ |
| | Poor risk communication | | | | | | √ |
| | Lack of rapid response to consumer issues | | √ | | | | |

√ =presence of gaps; China, PR = People's Republic of China; Lao PDR = Lao People's Democratic Republic
Source: Mekong Institute data.

**Table 3b: Bottlenecks to the Supply of Safety and Quality Assured Food and Increased Market Access for
GMS Food Supply**

| Bottleneck Area | Details | Cambodia | Lao PDR | Myanmar | Thailand | Viet Nam |
|---|---|-----------------|----------------|----------------|-----------------|-----------------|
| Supply chain management | Lack of technology and skilled manpower | √ | √ | √ | | √ |
| | Lack technical training | √ | √ | √ | | |
| | Poor infrastructure/logistics | √ | √ | √ | | |
| | Weak traceability system | √ | √ | √ | | √ |
| | Lack of access to reliable electricity and water | √ | | | | |
| | Weak enforcement of food laws | | √ | | | √ |
| | Poor value chain coordination | | | √ | √ | √ |
| | Poor market access | √ | √ | √ | | |
| | Improper processing | | | | √ | |
| | Wasteful use of natural resources | | | | √ | |
| | Lack of responsibility to protect consumers and the environment | | | | √ | |
| Business environment and availability of business services | Lack of knowledge of marketing, applying technologies, and enforcing or applying food safety laws/regulations | √ | √ | √ | √ | √ |
| | Lack of specialists in food safety work and research | √ | √ | √ | √ | √ |
| | Low interest in applying food safety systems | | √ | √ | | |
| | Lack of incentives for applying food safety systems | | √ | | | |
| | Failure of pesticide producers to inform farmers about correct use | | | √ | | |
| | Delays in custom processing | | | √ | | |
| | Large volume of low-value products (no value addition) | | | | | √ |
| | Lack of options to sustain | | | | | √ |

| | | | | | | |
|---|---|---|---|---|---|---|
| | competitiveness | | | | | |
| | Improving safety of domestic and export products | | | | | √ |
| | Insufficient support | | | | √ | |
| Availability of technical services (certification bodies, laboratory capacity, etc.) | Inadequate laboratory capacity (no central lab, limited number of testing labs, no ISO certification) | √ | √ | √ | | |
| | Limited technical specialists | √ | √ | √ | | |
| | Limited capacity in risk analysis | √ | √ | √ | | √ |
| | Insufficient ICT systems | | | | | √ |
| | Delays in harmonization and adoption of food safety standards | | | | | √ |
| | No independent consumer organization | | | | | √ |
| | Insufficient support from universities and research institutes | | | | √ | |
| | Lack of inter-ministerial coordination addressing food safety issues | | √ | | | |
| | No food safety database | | √ | | | |

√ = presence of bottlenecks, ICT = information and communications technology, ISO = International Standards Organization.

Source: Consultation meetings of Mekong Institute, 2016.

Table A5: Food Safety Initiatives in GMS Countries, 2011–2017 (supporting sources in parentheses)

| GMS Economy | Initiative | Brief Description |
|--------------------|--|---|
| All GMS | Towards a Non-Toxic Environment in South-East Asia (Sweden/FAO) | This project develops sustainable pest and pesticide management policies, strengthens the regulatory framework for controlling the distribution and use of pesticides, and enhances the capacity for implementing these policies and enforcing pesticide legislation. |
| CLMV | Mekong Institute Food Safety Project (NZAP) | The goal of the project is for policy makers in CLMV responsible for developing and implementing food safety regulations create an enabling food regulatory environment connected to private sector, their needs and market |
| | Capacity Building and International Food Safety Standards in ASEAN (Japan/FAO) | This project focuses on strengthening national capacity to develop national food safety standards in line with Codex standards, implementation of standards and contribution to international standards setting process. |
| | Pesticide Risk Reduction by Policy and Capacity Building (Sweden/FAO) | The overall objective is to promote sustainable, safe, profitable and environmentally-sound intensification of agricultural production through the development, promotion and practice of Integrated Pest Management |
| CLM | Food Safety Control Measures in Developing Asian Countries (GIZ) | This project strengthens the food safety standards in order to protect and promote consumer health by controlling the entire food chain and strengthens the role of COs in monitoring and carrying out market surveillance. |
| CLV | Improving Food Safety Management in CLV (NZAP) | The project provides trainings to small and medium sized enterprises, food handlers and market places about basic food hygiene, food regulations and quality assurance systems such as GAP, GHP, GMP and HACCP). |
| | Regional: Trade Facilitation: Improved Sanitary and Phytosanitary (SPS) Handling in GMS Trade (ADB) | The project conducts due diligence in the following aspects: (1) the capacities pursued and methods introduced need to be compliant with principles/ obligations under the WTO and ASEAN. They need also to be tailored to the needs of individual countries as identified in national SPS Action Plans and ADB's own analysis; (2) financial and economic viability will be assessed for the project investment, in particular cost-benefit, least cost and alternative analysis. Moreover, fiscal impacts of the investments and recurrent costs will be assessed to ensure that the developing member countries (DMCs) can sustain the Project operation; (iii) public financial management, procurement, policy, legal and institutional issues which are important for project implementation and cost-effectiveness of SPS services will be examined; (iv) poverty and social impacts assessment; (v) detail project implementation |
| | ASEAN-EU Programme for Regional Integration Support – Phase II (APRIS II) | The objective is to provide training on and audit the implementation of HACCP methods, GMP, GHP and risk analysis and management among SMEs in the agro-based sector in three selected ASEAN Member States—CLV. |
| CL | Standards in South-East Asian Food Trade (GIZ) | The project improves the food standards that will not only benefit to the health of people but also boost food to regional or international market |
| | Demonstration Company Project on Modern Food Safety Management Systems in Cambodia (APO) | This is a demonstration company project aimed at establishing sophisticated FSMS such as HACCP or ISO 22000 in food-processing companies that introduced GMP in previous projects. The project also educates NPCC staff to develop their consultancy ability on FSMS. Modern food FSMS will be promoted in the entire Cambodian food industry. |
| Cambodia | Structured Program to Achieve Food Safety Excellence in Cambodia (SAFE Cambodia) (ASSIST, TUV Rhineland, | This PPP project helps local SMEs adopt international standards to help them reduce operational inefficiencies and increase business opportunities on a larger scale. By collaborating on implementing the internationally approved practices, SMEs will be able to share their |

| GMS Economy | Initiative | Brief Description |
|------------------------------------|---|---|
| | DEG) | knowledge and create a valuable network to guarantee long-term success. |
| China, People's Republic of | China Food Safety Initiative (UCLA School of Law) | The Initiative aspires to enhance food governance in the PRC, with the ultimate aim of ensuring safe and healthy food for consumers. Through events as well as research development, discussion among leaders in the PRC on addressing food safety challenges is facilitated. |
| | 13th Five-Year Plan on Food Safety (State Council) | The Plan sets forth the following primary objectives: Enhance sample testing to cover all types of food; Effective governance of resource contamination; Reinforce on-site inspections: Establish a professional inspector team and standardized enforcement procedures and documentation; and Align PRC food safety standards with international standards. |
| | China National Center for Food Safety Risk Assessment (CFSA) | CFSA, established in Oct 2011, is a public health organization and national technical institution in charge of food safety risk assessment in the entire food chain; advises government on risk management matters; provides public information and science-based education on food safety issues for all stakeholders; addresses scientific needs of innovative industries. |
| | National Food Safety Standards Project | The Ministry of Health processes 83 national food safety standards in four categories: 4 basic standards, 45 food additives standards, 7 good production practice standards, 27 method of inspection standards |
| | Asia-Pacific Smart Agriculture & Food Safety Industry Demonstration Zone (SAFS) (UNOPS) | UNOPS assists the Government of Changchun to establish a 10-square-kilometer zone that showcases smart and sustainable agriculture, food safety innovation, and health management. |
| | EU China Trade Project II | The project supports the PRC government's trade and investment reform agenda by working under the EU-PRC economic and trade dialogues to promote fair competition and value for consumers; facilitate harmonization with international standards and promote safe products; improve food safety and quality; modernize customs; encourage a more transparent legal environment, and work towards transparency, good governance and equitable trade and investment policies. |
| | National Institute of Nutrition and Food Safety | The Institute conducts studies on health-related nutrition and food hygiene problems and trains nutrition and food hygiene specialists. The ultimate goal is to improve nutritional status, prevent foodborne diseases, and strengthen the physical fitness of the people. |
| | China - Jilin Food Safety Project (World Bank). | The project improves the legal and regulatory environment and the institutional capacity in both the private and public sector to manage agricultural product safety and quality in Jilin Province. |
| | GlobalGAP Farm Assurer Capacity Building Program (GlobalGAP) | The project establishes the GLOBALGAP Farm Assurer as a universally recognized brand that communicates a high level of competence and integrity. |
| | Walmart Food Safety Collaboration Center | Walmart Foundation funded three projects An initiative with CCTF focused on educating children and parents across the PRC by increasing knowledge of safe handling of food in the household; A collaborative research project bringing together US and PRC academics and PRC poultry producers to study safety in poultry supply chains; and a collaborative research project bringing together the Massachusetts Institute of Technology, Zhejiang University, and Tsinghua University that will use supply chain analytics and state-of-the-art technology to rapidly predict and detect those areas of greatest vulnerability for food adulteration in food supply chains. |
| Lao PDR | Technical assistance to strengthen emergency preparedness for Highly Pathogenic Avian Influenza | The purpose of this project is to reduce the spread of H5N1 in poultry in the country, thus minimizing the risk of contagion to other mammals and humans and the possibility of a pandemic. |

| GMS Economy | Initiative | Brief Description |
|-----------------|---|---|
| | (FAO) | |
| | Lao Organic Agriculture Promotion Project (JICA) | The project builds knowledge and human resource capacity to ensure organic agriculture systems are fully functional.. |
| | Laos Pilot Program (LPP) for Narrowing the Development Gap Towards ASEAN Integration (ASEAN Secretariat, JICA) | The LPP aims to balance development growth with environmental conservation, to create harmonization of development. The LPP has agriculture component to introduce GAP for safe and quality agricultural production promotion. |
| | National Nutrition Strategy to 2025 and Plan of Action 2016-2020 | The project employs a multisectoral convergent approach with common focus points, common goals, and common timeframes while boosting resources and increasing support from development partners and the relevant stakeholders to the greatest extent possible to reduce all forms of malnutrition among women, children and disadvantaged groups, to achieve success, and meet the set targets. |
| Myanmar | Improving Food Safety Compliance with SPS to Increase Export in Oilseeds (WTO STDF) | The project improves food safety and compliance with SPS measures for market access to increase export revenues of farmers, processors and exporters along the oilseed value chain. |
| | Food Safety Regulation & Enforcement (NY Wagner; New York University) | The project identifies the main challenges in food safety, its regulations, and enforcement. |
| | Strengthening National Quality Infrastructure for trade (NORAD) | The project strengthens Myanmar's national capacity to provide internationally recognized laboratory testing services to food producers and exporters. |
| | Enhancing of Food Safety (Japan Grassroots) | The project aims to enhance the quality of local agro-products and protect Myanmar people from contaminated food with excessive use of harmful chemicals. |
| Thailand | | Huge investment in hard and soft infrastructures to develop modern and world-class food safety management systems for domestic market and export engagements fueling rapid economic growth, with the food industry contributing 23% to GDP, \$ 27 billion exports, and more than 20 million people employed. |
| Viet Nam | Livestock Competitiveness and Food Safety Project (World Bank) | The project aims to increase the production efficiency of household-based livestock producers, reduce the environmental impact of livestock production, processing and marketing, and improve food safety in livestock product supply chains (mainly meat) in selected provinces. |
| | Canada funds food safety project in Vietnam | Canada will soon provide an aid package of about CAD15 million (US\$11.3 million) for a food safety project in Vietnam. |
| | Strengthening Vietnamese SPS Capacities for Trade - Improving safety and quality of fresh vegetable through the value chain approach (FAO UN) | The project develops vegetable value chain; GAP training manual; pilot model with VIETGAP; information exchange WS/forum; linkages between growers and vendors |
| | Outbreak Mechanisms and Development of a Surveillance Model for Multi-drug Resistant Bacteria | The projects establishes the mechanism of multi-drug resistant bacteria, develops a comprehensive monitoring system for antibiotics residue and antibiotic resistant bacteria over the process from food production to intake; and trains researchers and technical staff related to food safety monitoring. |
| | Strengthening International Health Regulations Core capacity on Food Safety (WHO) | The project reviews MOH legislation documents (review food safety law); strengthens national capacity for foodborne disease surveillance and response; and strengthens national and international network and collaboration/ coordination to respond to foodborne hazards (e.g., development of emergency response plan; and active participation in the platform) |

| GMS Economy | Initiative | Brief Description |
|-------------|--|---|
| | Veterinary Intervention for Anti-microbial Reductions in Chicken Production (ViParc) | The project develops diagnostics for poultry diseases; investigates antimicrobial resistance; and conducts cost-benefit analyses. |
| | Supporting small-scale pig production in Viet Nam through reducing disease risk, enhancing productivity and upgrading value chains (ACIAR) | The project improves the livelihoods of rural and urban poor in Viet Nam through improved opportunities and incomes from pig value chains as a result of reduced risks associated with pork-borne diseases. |

ACIAR = Australian Centre for International Agricultural Research; ADB = Asian Development Bank; ASEAN = Association of Southeast Asian Nations; ASSIST = Asia Society for Social Improvement and Sustainable Transformation; CCTF = China Children and Teenagers' Fund; CL = Cambodia and the Lao PDR; CLM = Cambodia, the Lao PDR, and Myanmar; CLMV = Cambodia, the Lao PDR, Myanmar, and Viet Nam; CLV = Cambodia, the Lao PDR, and Viet Nam; DEG = Deutsche Investitions-und Entwicklungsgesellschaft mbH; EU = European Union; FAO = Food and Agriculture Organization of the United Nations; FSMS = food safety management system; GAP = good agricultural practices; GDP = gross domestic product; GHP = good hygiene practices; GIZ = Deutsche Gesellschaft für Internationale Zusammenarbeit, GmbH; GMP = good manufacturing practices; GMS = Greater Mekong Subregion; HACCP = hazard analysis critical control point; ISO = International Standard Organization; JICA = Japan International Cooperation Agency; Lao PDR = Lao People's Democratic Republic; LPP = Laos Pilot Program; NORAD = Norwegian Agency for Development Cooperation; NZAP = New Zealand Aid Programme; PPP = public-private partnership; PRC = People's Republic of China; SPS = sanitary and phytosanitary; SME = small and medium size enterprises; STDF = Standards and Trade Development Facility; UCLA = University of California, Los Angeles; UN = United Nations; UNOPS = United Nations Office for Project Services; US = United States; WHO = World Health Organization; WTO = World Trade Organization.

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Table A6: Sanitary and Phytosanitary and CODEX Initiatives in GMS Countries

| Cambodia | China, People's Republic of | Lao People's Democratic Republic | Myanmar | Thailand | Viet Nam |
|--|--|---|--|--|--|
| Capacity Building and International Food Safety Standards in the ASEAN (Japan and FAO) | National Food Safety Standards Project | Capacity Building and International Food Safety Standards in the ASEAN (Japan and FAO) | Capacity Building and International Food Safety Standards in the ASEAN (Japan and FAO) | Amended its CODEX system in 2004 by a ministerial decree | Capacity Building and International Food Safety Standards in the ASEAN (Japan and FAO) |
| Regional: Trade Facilitation: Improved Sanitary and Phytosanitary (SPS) Handling in GMS Trade (ADB) | 13th Five-Year Plan on Food Safety (State Council) | Regional: Trade Facilitation: Improved Sanitary and Phytosanitary (SPS) Handling in GMS Trade (ADB) | Food Safety Control Measures in Developing Asian Countries (GIZ) | Continuing strengthening of standards (e.g. Q GAP and ThaiGAP) to conform with international standards | Regional: Trade Facilitation; Improved Sanitary and Phytosanitary (SPS) Handling in GMS Trade (ADB) |
| Food Safety Control Measures in Developing Asian Countries (GIZ) | | Food Safety Control Measures in Developing Asian Countries (GIZ) | Improving Food Safety Compliance with SPS to Increase Export in Oilseeds (WTO STDF) | | Strengthening Vietnamese SPS Capacities for Trade—Improving safety and quality of fresh vegetable through the value chain approach (FAO) |
| Developing SPS action plan for Cambodia -ADB-SPS Standards Management Systems Phase 2 | | Technical Assistance for Further Development of SPS-related Legal Framework in the Lao PDR (FAO) | | | |
| Standards in South-East Asian Food Trade (GIZ) | | Standards in South-East Asian Food Trade (GIZ) | | | |

ADB = Asian Development Bank; ASEAN = Association of Southeast Asian Nations; CODEX = CODEX Alimentarius (Food Code); FAO = Food and Agriculture Organization of the United Nations; GAP = good agricultural practices; GIZ = Deutsche Gesellschaft für Internationale Zusammenarbeit, GmbH; GMS = Greater Mekong Subregion; Lao PDR = Lao People's Democratic Republic; SPS = sanitary and phytosanitary; STDF = Standards and Trade Development Facility; WTO = World Trade Organization.

Sources: Sources gathered and consolidated by the Mekong Institute

Table A7: Private-Sector-Driven Initiatives in Food Safety in GMS Countries

| Initiative | Cambodia | China, People's Republic of | Lao People's Democratic Republic | Myanmar | Thailand | Viet Nam |
|------------|--|---|--|---|---|--|
| PGS | <ul style="list-style-type: none"> Started 2014 13 PGS groups >180 farmers Agencies involved: GDA, CEDAC, Caritas, COD, NAV Pilots operating effectively Products now at markets; restaurants are interested; farmers felt ownership and proud to be part of PGS <p>Next steps: prepare national logo; complete the national organic standard; adopt PGS for national standard/certification system; increase number of PGS groups; capacity building; national campaign; form "green show network"</p> | <ul style="list-style-type: none"> 2 PGS groups (rice and vegetables); Guangxi province >125 farmers mostly female Agencies involved: Farmers Seed Network, OXFAM HK Marketing thru local and farmer's markets, consumer associations, online thru rural e-commerce (set up by Alibaba). Branded as PGS; Chinese regulation does not allow products to be called organic <p>Next steps: conduct national PGS workshop to strengthen with govt representation; up-scaling; lobbying; awareness raising; market</p> | <ul style="list-style-type: none"> Started 2015 3PGS groups >250 farmers Agencies involved: DOA, GRET, SAEDA PGS as certification tool and option in DOA program PGS can be used for organic or GAP certification (separate standards & labels) National/local structures set No govt funding; local initiatives supported by NGOs (GRET, SAEDA) <p>Next steps: organize workshops to improve the system; establish National Platform/ Task Force that works on the action plan and national guidelines</p> | <ul style="list-style-type: none"> Started in 2014 9 PGS groups >100 farmers Agencies involved: MOGPA PGS is already known First certificates soon to be issued for 8 groups Govt shows positive attitude but recourses limited Main communication channel=Facebook At domestic market, tea and coffee are available organic (PGS and 3rd party), rice, fruits, mushrooms, and vegetables are starting now <p>Next steps: provide technical support; collaborate with govt; capacity building; develop a national PGS network and market linkage; info campaign</p> | <ul style="list-style-type: none"> 16 PGS groups >1,500 farmers Agencies involved: Earth Net, Lemon Farm, TOAF, POAA Government supports PGS as a development tool Lemon Farm is the success model from private sector-led PGS with strong market facilitation (14 shops in BKK) Mainstream markets: TOPS supermarket <p>Next steps: consolidate PGS movement; create platform for exchange and networking "Thai PGS Movement"</p> | <ul style="list-style-type: none"> Started in 2008 5 PGS groups >350 farmers Agencies involved: ADDA, VOAA Now more resilient with strong links to Ha Noi markets No regulation or recognition Relevant govt agencies now interested Build the PGS bottom-up with strong market links <p>Next steps: continue policy lobbying for govt adoption of PGS guidelines and standards; capacity building; upscaling and awareness raising; improve traceability (smartphone/apps)</p> |

| Initiative | Cambodia | China, People's Republic of | Lao People's Democratic Republic | Myanmar | Thailand | Viet Nam |
|------------|--|--|--|---|--|--|
| | | strengthening; target PGS recognition at central level by 2020 | | | | |
| | | | Small-Scale Farmer Inclusion in Organic Agriculture thru PGS, addresses certification and marketing issues thru PGS and raising awareness on benefits of organic agriculture and PGS for envt, health, and livelihoods in rural areas | | | Scaling up PGS among smallholder farmers, consumers, and private actors in Viet Nam (VECO) The project supports the PGS groups to strengthen their production, marketing, and management skills |
| GI | <ul style="list-style-type: none"> • 2 GI products (Kampot pepper and Kampong Speu palm sugar) • 3 GIs pending in EU • Promotion of Rural Devt thru Devt of GI at Regional Level in Asia: CLVT (FAO) • Law on GI in Cambodia | <ul style="list-style-type: none"> • 2,984 GIs with 83 foreign GIs • Agencies involved: State Admin for Industry and Commerce, Trade-mark Office, General Admin of Quality Supervision, Inspection and Quarantine, Ministry of Agriculture • EU-PRC GI-10 plus 10 project | <ul style="list-style-type: none"> • No GI product • Promotion of Rural Devt thru Devt of GI at Regional Level in Asia-CLVT (FAO) • Implementing GI under the Intellectual Property Law Oct 2016 • Establishment of Trademark and GI Division, Ministry of Science and | <ul style="list-style-type: none"> • 1 foreign GI product • GI protection under Trademark Law, Sept 2014 • Formulation of a GI regulatory framework • GI training • Awareness raising events • Plan to enact GI law • 1st GI product Ywangan Coffee for processing in 2017 | <ul style="list-style-type: none"> • 61 GI products with 5 in EU (3 pending), 1 in Viet Nam • 11 foreign GI products • Promotion of Rural Devt thru Devt of GI at Regional Level in Asia—CLVT (FAO) • GI products: Khao Hom Mali Thung Kula Rong (2013 EU) | <ul style="list-style-type: none"> • 48 GI products with 39 in EU and 2 pending in Thailand • 4 foreign GI products • 169 GI from EU protected with FTA • Promotion of Rural Devt thru Devt of GI at Regional Level in Asia—CLVT (FAO) |

| Initiative | Cambodia | China, People's Republic of | Lao People's Democratic Republic | Myanmar | Thailand | Viet Nam |
|------------------------|---|---|--|--|--|--------------------------|
| | | <ul style="list-style-type: none"> protection of 10 famous EU food names in the PRC with GI. In parallel, EC examined and registered 10 PRC food names with GI status EU-PRC Trade Project II providing support to ongoing bilateral negotiations on GI | Technology to coordinate GI registration | | registered), Isan Indigenous Silk Yarn (2014 Viet Nam registered); 3 EU applications Kafae Doi Chaang (Coffee), Kafae Doi Tung (Coffee) and Khao Sungyod Muang Phattalung (Rice) | |
| Private company | <ul style="list-style-type: none"> Natural Garden Safe and Organic produce Green-O Farm chemical free produce Amarak Veggie Store Happy Farm Aliment Organic Foods | | Lao Fresh Meats | <ul style="list-style-type: none"> Myanmar Food Processors and Exporters Association-lab testing; training on food quality Myanmar Consumer Union-awareness raising,, advocacy, consumer seminars Shan Maw Myae-form and promote organic groups | Public-Private Collaborative Committee: New Sustainable Growth Path 2016- "Community Product to Modern Trade" standardizes cash crop production under "Thai GAP" and "Primary GAP" | Binh Dinh Safe Vegetable |

ADDA = Agricultural Development Denmark Asia; CEDAC = Cambodian Center for Study and Development in Agriculture; COD = Center for Organic Development; CLTV = Cambodia, the Lao PDR, Thailand, and Viet Nam; DOA = Department of Agriculture; EC = European Community; EU = European Union; FAO = Food and Agriculture Organization of the United Nations; GAP = good agricultural practices; GDA = General Directorate of Agriculture; GI = Geographical Indication; GRET = Groupe de Recherches et d'Echanges Technologiques; MOGPA = Myanmar Organic Grower and Producer Association; NAV = Natural Agricultural Village; NGO = nongovernment organization; PGS = participatory guarantee system; SAEDA = Sustainable Agriculture & Environment Development Association; TOAF = Thai Organic Agriculture Foundation; VECE = Vredes Eilanden Country Office; VOAA = Vietnam Organic Agriculture Association, Source: Various sources gathered and consolidated by the Mekong Institute.

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About the Core Agriculture Support Program

The Core Agriculture Support Program (CASP) supports the GMS in attaining its goal of being a leading producer of safe food using climate-friendly agriculture practices. Now on its second phase, since 2012, CASP2 is committed to increasing the subregion's agricultural competitiveness through enhanced regional and global market integration and subregional connectivity.

The agriculture ministries of the six GMS countries manages the implementation of CASP2 through the GMS Working Group on Agriculture (GMS WGA). A technical assistance (TA 8163) with financing from the Asian Development Bank, the Government of Sweden, the Nordic Development Fund, and the Water Financing Partnership Facility supports the CASP2 implementation. The GMS WGA oversaw the development of the discussion papers.

About the Asian Development Bank

ADB's vision is an Asian and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to a large share of the world's poor. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

Core Agriculture Support Program Phase II

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