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Addressing Food Safety Challenges of the Asia-Pacific Region

Executive Summary

Food security, nutrition and food safety are inextricably linked. Countries in the Asia-Pacific region and the major trade blocs of which they are part, including the Association of Southeast Asian Nations (ASEAN), the South Asian Association for Regional Cooperation (SAARC), the Greater Mekong Subregion (GMS) and the Pacific Islands Forum (PIF) have clearly articulated food safety as a development priority for their people.^{1,2,3,4} Ensuring the availability of safe, nutritious and diversified food is the joint responsibility of governments, the private sector and consumers. It requires an integrated and science-based approach from farm-to-fork which keeps pace with shifts and changes in agriculture and food systems, technology, lifestyles and trade policies. Countries in the region are focused on modernizing their food safety systems to ensure the availability of safe and nutritious food for the projected five billion inhabitants in 2050. At the same time, new and emerging threats posed to food safety by overpopulation, urbanization, environmental pollution and

¹ ASEAN. 2016. The ASEAN Food Safety Regulatory Framework (AFSRF). [available at <http://asean.org/storage/2016/08/ASEAN-Food-Safety-Regulatory-Framework.pdf>].

² Asian Development Bank. 2017. Ministers Agree to Step Up Cooperation on Boosting Food Safety in Mekong. [available at <https://www.greatermekong.org/ministers-agree-step-cooperation-boosting-food-safety-mekong>].

³ SAARC. 2014. Kathmandu declaration of the eighteenth meeting of the heads of state or government.

⁴ WHO, FAO, PIF, SPC and UNICEF. 2010. Report of the Pacific Food Summit [available at <http://www.wpro.who.int/nutrition/documents/docs/PacificFoodSummitReport.pdf>].

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increased proximity and the ease of mobility of people and animals in large numbers across borders requires the broad-based One Health approach. To this end, FAO will continue to assist countries with institutional, regulatory, voluntary and participatory solutions to improve food safety for healthy diets and enhance trade in agricultural and food commodities.

Guidance sought from the Regional Conference

The Regional Conference is invited to:

- provide guidance on cohesive actions by FAO to support member countries in improving food safety, ensuring better nutrition and enhancing trade;
- share national actions, experiences and knowledge on improving food safety in agriculture and through the food chain for safe and nutritious diets;
- advise FAO on advancing the development of indicators for food safety as a systematic mechanism to track progress on improving national food control systems; and
- recommend actions through the Regional Initiative on One Health to strengthen cooperation with the regional bodies, international financial institutions and partnering international organizations for long-term investments in food safety.

I. Food safety in the Asia-Pacific region

1. In 2015, the World Health Organization (WHO) published a comprehensive report on the impact of contaminated food on health and well-being.⁵ The report showed that nearly one in ten people fall ill every year from eating contaminated food, with 420 000 dying as a result and low-income areas being most affected. Children under five years of age are at particularly high risk, accounting for one-third of the deaths. The study also outlined stark differences between the Asian and Pacific subregions. The burden of food-borne diseases (FBDs) was about 700 disability adjusted life years (DALYs) per 100 000 population in the former and 140-360 DALYs in the latter. In the Asian region, diarrheal disease agents and invasive infectious disease agents contributed more than 80 percent of the total disease burden, with helminths, chemicals, toxins and others responsible for the rest. In the Pacific region, the distribution of causal agents is different, with diarrheal disease agents responsible for about 15 percent of FBDs, but with seafood-borne trematodes or parasites causing up to 50 percent of FBDs, particularly in the small island developing states. The approach to improving food safety in the two subregions needs to focus both on minimizing specific and known risks and assuring control along the production and supply chains from farm to fork, to prevent existing and new hazards from emerging.

2. In Asia, as evidenced by the above study, the lack of hygiene and sanitation and low awareness of good practices along the food chain such as the five keys to food safety led to the bulk of FBDs being caused particularly by *E.coli*, norovirus, *Salmonella* spp. and *Campylobacter* spp. which originate from diverse sources in agriculture sectors such as crops, livestock, fisheries, aquaculture and forestry (tree fruits), as well as human-induced cross-contaminations. This is further exacerbated by malpractices such as adulteration, food fraud and accidental contamination as a result of poor health and safety protocols. The presence of physical contaminants (e.g. glass, metal, sawdust), undesirable biological populations (insects and bacteria such as *Salmonella* and *E. coli*) and chemical contaminants (e.g. aflatoxins, pesticides, heavy metal and veterinary drug residues or pesticides above maximum residue limits [MRLs]) demonstrates the lack of sanitary and phytosanitary (SPS) measures

⁵ WHO. 2015. WHO estimates of the global burden of food-borne diseases. [available at http://apps.who.int/iris/bitstream/10665/199350/1/9789241565165_eng.pdf?ua=1].

and low enforcement of regulatory measures throughout the farm to fork spectrum. Besides affecting the health of consumers, they are responsible for trade rejections at borders.⁶ Examples of these include the melamine-in-milk scandal in China which caused the death of at least six babies and the hospitalization of thousands of others (2008),⁷ the presence of lead above permitted levels in noodles in India (2015)⁸ and in turmeric powder and other spices exported from multiple Asian countries (2013-17).⁹ Also, the International Food Safety Authorities Network (INFOSAN) jointly hosted by FAO-WHO is in the midst of coordinating communications to recall infant formula linked to a 2018 outbreak of salmonellosis in France, in at least five Asian countries.¹⁰

3. In the Pacific subregion, fish is the staple protein source in many communities, and many islands suffer ongoing outbreaks of ciguatera, an illness caused by the presence of a toxin produced in reef fish by very small marine organisms. In the last two years alone, a large number of cases (ranging from the tens to hundreds) of poisoning due to toxins in fish (Fiji, Nauru, Samoa and Tonga) as well as microbial contamination in leafy vegetables (American Samoa, Fiji, Samoa and Tonga) and hepatitis (the Marshall Islands) have been reported. Hazards from fish also result from unsuitable storage (histamine accumulation) and environmental pollution (lead and mercury in capture and production areas). Inappropriate timing and temperature control at postharvest handling of fish in Fiji was shown to increase the risk of high histamine concentration levels in fish^{11, 12}. As in Asia, these are the symptoms of a weak risk-based food control system and inadequate enforcement of good practices and standards.¹³

4. In the last decade, Asia has become a major source of food imports for the European Union (EU), the United States of America (USA) and other developed economies such as Japan. In 2016, the East Asia and the Pacific region (including New Zealand and Australia) exported nearly USD 211 billion worth of food and South Asia almost USD 35 billion worth of food.¹⁴ This actually brings to the fore the duality of food safety systems in Asia. Many countries, with strong support from international trade organizations and import markets, have developed world-class export-oriented food safety systems which incorporate risk-based preventative protocols and good practices at all stages – from the primary production, harvest/slaughtering, processing and packaging, storage, transport, wholesale, retail to finally reach consumers. For instance, shrimp imports from Bangladesh into the EU were banned in 2008-2009 due to the presence of veterinary drug residues (nitrofurans metabolites) above MRLs. But the EU invested in the implementation of good practices and food safety management systems across the chain and shrimp exports from the country bounced back.

5. Besides earning valuable foreign exchange through exports, trade has enhanced the reputation of exporting countries such as India (fruits and vegetables), Myanmar (fish), Thailand (rice), and Viet Nam (peppercorns). This worldwide acceptability of exports from the region, on the basis of food safety, is at odds with the prevalence of FBDs and the general perception of food safety in the same

⁶ European Commission. 2018. Rapid Alert System for Food and Feed

[available at <https://webgate.ec.europa.eu/rasff-window/portal/index.cfm?event=notificationslist>].

⁷ Unnevehr, L. and Ronchi, L. 2014. Food safety and developing markets: research findings and research, IFPRI.

⁸ Fry, E. 2016. Nestlé's half-billion-dollar noodle debacle in India [available at <http://fortune.com/nestle-maggi-noodle-crisis/>].

⁹ FDA. 2017. Detention without physical examination of spices and spice products due to lead contamination [available at https://www.accessdata.fda.gov/cms_ia/importalert_1143.html].

¹⁰ FAO/WHO. 2018. INFOSAN in action to control an outbreak of salmonellosis linked to infant formula [available at http://www.who.int/foodsafety/areas_work/infosan/Salmo-formula/en/].

¹¹ Lako, J. et al. 2015. Postharvest handling practices and the development of histamine in giant trevally (*Caranx ignobilis*) fish: the case of Fiji. *The South Pacific Journal of Natural and Applied Sciences*, 33: 1–6.

¹² Tao, Z. et al. 2010. A survey of histamine content in seafood sold in markets of nine countries. *Food Control*: 1–3.

¹³ FAO. 2017. Brief on food safety in the Pacific countries: Gap analysis of selected Pacific island countries.

¹⁴ World Bank and UNCTAD. 2018. World Integrated Trade Solution [available at <https://wits.worldbank.org/Default.aspx?lang=en>].

countries. For instance, it suggests that while exports do provide a major incentive to improve food safety, consumer perception and concerns about health are not sufficient incentives to propel food safety forward. This is paradoxical, as domestic trade would generally be expected to have a higher volume and possibly more value than exports.

II. Food safety and nutrition

6. Nutrition could provide a much needed additional impetus as it is underpinned by food safety. Studies have shown that poor hygiene and unsafe food are associated with inadequate assimilation and absorption of nutrients in the gastro-intestinal tract. Apart from FBDs, this leads to stunting and wasting in children, which in turn leads to their growth potential remaining unfulfilled and their living less productive lives as adults. Aflatoxins, for instance, are produced by certain fungi growing on grain, and in particular on corn, and have been shown to be associated with growth reduction.¹⁵ They are directly consumed by humans in poorly stored cereals or by animals as feed and can therefore be detected in milk. Asia already carries the multiple burdens of malnutrition including undernutrition, obesity and overweight and hidden hunger due to micronutrient deficiency. The overall Prevalence of Undernourishment (PoU) has plateaued at around 11.7 percent¹⁶ over the last three years, suggesting relatively little improvement in the overall number of malnourished, currently at around 491 million. In the Pacific subregion, the PoU is substantially less, at 6.5 percent, but this is overshadowed by the cumulative prevalence of overweight and obesity among more than 70 percent of the adults in Fiji, Kiribati, Samoa, Tonga and Tuvalu and only slightly less at 60 percent in Papua New Guinea, Solomon Islands and Vanuatu.¹⁷ A number of factors have been found to contribute to the rise of overweight and obesity.¹⁸ These include: food habits such as high-fat diets and excessive consumption of refined carbohydrates; trade liberalization, which makes a wide variety of fast foods available; increased frequency of eating away from home; and the influence of mass media and sedentary lifestyles. While overweight and obesity in the Asian subregion are around 30 percent and 10 percent, respectively, these are a growing problem in most countries due to urbanization and shifts in consumer preferences. Clearly, ensuring food safety is vital for the achievement of Sustainable Development Goal (SDG) 2 (nutrition for all), SDG 3 (good health and well-being) and SDG 12 (sustainable consumption and production).

7. Since 2012, Codex Alimentarius has recommended that nutrition labelling be mandatory for the majority of pre-packaged foods. All relevant information must be displayed on the label to ensure fair practices and allow consumers to make informed decisions (e.g. in case of allergies) or compare different products. Unhealthy diets is one of the leading causes of the global burden of disease, and carries significant economic and social costs. A growing number of governments now require additional nutritional information on food products, in the form of front-of-pack labelling, giving consumers a visual representation of the amount of certain substances, such as sugar, fat and salt, sometimes linked to colour-coding to motivate consumers to avoid foods high in certain components such as carbohydrates.

8. For food safety and nutrition, data on food consumption is one of the key needs. Individual food consumption data are being collected in many countries, including low-income countries. However, the data produced are largely underutilized, due to poor dissemination and a lack of data harmonization that prevents comparisons across periods of time, seasons and geographical locations.

¹⁵ Leroy, J. 2013. Child stunting and aflatoxins. In: Aflatoxins: Finding solutions for improved food safety. IFPRI.

¹⁶ FAO. 2017. Asia and the Pacific - Regional Overview of Food Security and Nutrition. [available at <http://www.fao.org/3/a-i6481e.pdf>].

¹⁷ FAO. 2016. Asia and the Pacific - Regional Overview of State of Food Security and Nutrition. [available at <http://www.fao.org/3/a-i7930e.pdf>].

¹⁸ FAO. 2017. Effects of food taxation in Tonga: a snapshot [available at <http://www.fao.org/3/a-i8052e.pdf>].

The FAO/WHO Global Individual Food consumption tool (GIFT)¹⁹ platform is meant to be a response to this situation. It is a publicly available multipurpose global database obtained through the collation and harmonization of data collected from individual food consumption surveys conducted at national or subnational level. It can host data contributed by countries and make them accessible to all, while maintaining data ownership and visibility of the originating institution. Data on individual food consumption as well as total diet studies are needed to better inform agricultural and food policies and programmes at global, national and subnational level and make them more nutrition-sensitive. In particular, food-based indicators expressed as nutrient intakes (i.e. estimates of the quantity of nutrients ingested by population groups, based on the type and quantity of foods eaten, combined with the food composition of those same foods and total diet studies) are needed to inform nutrition-sensitive agriculture and fortification programmes and policies. The same data can be used for calculating the exposure of individuals and populations to contaminants, defining acceptable daily intake, and setting MRLs for food safety.

III. Food safety and trade

9. Food products are the third most valuable commodity group traded internationally, with a value estimated at USD 1.7 trillion.²⁰ Many countries, including developing countries, import a significant proportion of their food supplies. As a result, trade and food safety have become inseparably linked over the past couple of decades. The World Trade Organization (WTO) has two international agreements – one on Sanitary and Phytosanitary Measures and one on Technical Barriers to Trade – that define a framework for control measures to protect the health of consumers and ensure fair practices in food trade.²¹ For WTO member countries, the international food standards developed by the Codex Alimentarius Commission have become significant food safety reference documents to follow the agreements. Codex standards and texts provide a useful overarching framework on which countries should base their control measures as appropriate to their situation, specific challenges and resources. The use of international food standards worldwide not only contributes to public health, but also helps reduce trade costs by making trade more transparent and efficient, allowing food to move more smoothly between markets. Strengthening National Codex Committees and capacity-building for meaningful participation in Codex standards formulation activities remains an integral part of FAO's activities in the region. The use of Codex as a framework is being enhanced in ASEAN countries in particular. They are being supported to harmonize standards at the regional level to promote free trade in the bloc and with key non-member partner countries such as Australia, China, India, Japan, New Zealand and Republic of Korea. This will in turn bolster Asia Pacific Economic Cooperation as and when its members adopt a free trade agreement. Through its South-South and Triangular Cooperation (SSC&TrC) Programme, FAO is facilitating exchanges of experience and expertise in the region. China has sent over 1 000 experts and technicians to 26 countries in Africa, Asia, the South Pacific, and Latin America and the Caribbean, through FAO's South-South Cooperation Programme. Results have included positive contributions to improve agricultural productivity and food security in developing countries.²²

10. With food trade growing annually at 10 percent, border controls need to be bolstered. Situations exist in Asia and the Pacific where imports flow into a country from another country with

¹⁹ FAO. 2015. FAO/WHO GIFT | Global individual food consumption data tool [available at <http://www.fao.org/gift-individual-food-consumption/en/>].

²⁰ World Bank and UNCTAD. 2018. World Integrated Trade Solution [available at <https://wits.worldbank.org/Default.aspx?lang=en>].

²¹ FAO and WTO. 2017. Trade and food standards [available at <http://www.fao.org/3/a-i7407e.pdf>].

²² FAO. 2017. South-South Cooperation plays vital role in promoting sustainable development [available at <http://www.eco-business.com/news/south-south-cooperation-plays-vital-role-in-promoting-sustainable-development/>]

virtually no checks of the paperwork or the products, and with labels in a language foreign to the importing country. As the food makes its way onto consumers' tables, there is little or no information of either its safety or compositional aspects. This is also a critical issue in the Pacific islands as a large proportion of the food supply is imported. Effective import control systems are a potent tool that allow national authorities to focus scarce resources on the regulated entry and sale of foods that have diverse and sometimes unknown risks.²³ This enables countries to create a balance between their trade facilitation commitments and at the same time safeguard public health. Countries need to have a knowledge-based system of risk-categorization and risk-based inspection. This includes coordination with key national partners from phytosanitary, veterinary and quarantine agencies so that potential risks are foreseen and entry is regulated properly at the border points. In four countries – Myanmar, Nepal, Philippines and Sri Lanka – the existing national practices and procedures for control of imported animals, plants and food are being assessed and technical assistance is being provided for the development and improvement of risk management systems using the One Health approach. This will help to create a more harmonized approach to import control, especially within trade blocs, and create a more transparent, up-to-date and effective system. Measures such as e-certification will unify multiple health, safety and quality certificates and support improved traceability. The application of the One Health approach in import control measures will also support the INFOSAN during emergencies and incidents, in the recall of unsafe food traded across borders. Regional guidance on criteria on Hazard Analysis and Critical Control Points (HACCP) and Good Manufacturing Practices (GMP)²⁴, and advice for Asian producers and exporters on regulations, standards and certification for exports have been made available.

11. New technologies are shaping food supply and manufacturing and also providing new methodologies for testing, monitoring and traceability. 3D-printing of food, the adoption of high-pressure and machine-learning techniques in processing, and advances in preservation and packaging are changing the quality of diets. Cutting-edge technologies such as facial recognition (e.g. in providing an identity to organically raised chickens),²⁵ the use of blockchain (e.g. in automated cold chain management)²⁶ and biosensors (to detect changes in temperature or storage conditions that affect food safety) are being used to track the movement and authenticity of food and ingredients. E-commerce and online sales including mobile applications are disrupting the centuries-old way of grocery shopping at shops and stores. According to a recent Nielsen survey, 22 percent of respondents in the Asia-Pacific region, 11 percent in South East Asia and 40 percent in China and the Republic of Korea purchased fresh groceries online regularly, compared to 14 percent of consumers globally.²⁷ It is important that regulations now ensure that food sold on e-commerce platforms conforms to the same food safety requirements as that sold in brick and mortar markets.

12. Informed consumers prefer food that is convenient and certified as safer, healthier and/or environment-friendly. As governments do not have the resources to certify all food in a country, FAO supports a legal and enabling environment for the adoption of voluntary and private standards such as those of the International Organization for Standardization, Food Safety System Certification, organic and halal standards and their certification by privately accredited bodies. This ensures adherence of industry to food safety standards and gives the private sector the room to innovate and develop new foods and formulations. Food safety has also been incorporated into a number of products that have been registered under the Geographical Indications (GI) label in Cambodia, Lao People's Democratic

²³ FAO. 2016. Risk-based import control manual. [available at <http://www.fao.org/3/a-i5381e.pdf>].

²⁴ FAO. 2016. A regional guidance on criteria for GMP/HAACP for Asian countries. [available at <http://www.fao.org/3/a-i4163e.pdf>].

²⁵ McDougal, A. 2017. China: Facial recognition for chickens Poultry World [available at <http://www.poultryworld.net/Home/General/2017/12/China-Facial-recognition-for-chickens-227586E/>].

²⁶ Fainor, J. 2017. Blockchain: The next revolution in the food supply chain [available at <https://www.fooddive.com/news/blockchain-the-next-revolution-in-the-food-supply-chain/513741/>].

²⁷ Nielsen. 2017. What's in store for online grocery shopping [available at <http://www.nielsen.com/ie/en/insights/reports/2017/whats-in-store-for-online-grocery-shopping.html>].

Republic, Thailand and Viet Nam. This approach of integrating food safety and GI promotes trade through innovation as well as environmental sustainability through good farming and post-harvest practices. It also provides a platform for countries to showcase their traditional food commodities as part of their cultural identity and thus increases their visibility in the international market.

IV. FAO's role in food safety

13. A food safety system is only as effective as the weakest control along the food chain. FAO aims to improve food safety within all countries and for all parties. FAO's approach is based on the general principles for strengthening food safety systems by building capacity for and putting in place risk-based food control systems and implementing international food safety standards as established by the Codex Alimentarius Commission.²⁸ FAO pursues a coordinated, cross-sectoral and multidisciplinary approach that involves relevant government ministries and agencies (food, agriculture, livestock, fisheries, health, trade, commerce, industries, consumer protection, standards and others) as well as private industry and consumer organizations. The role of the government is to develop and provide the legal framework, enforce legislation and regulations and coordinate all its ministries and agencies to deliver robust, consistent and reliable food safety control programmes. The private sector must be fully committed to the implementation of regulations and risk-based food safety management systems and take full responsibility for the production and distribution of safe food. Consumers have a responsibility to be vigilant and report incidents and possible violations to the competent authorities.

14. FAO acts at multiple levels in many countries. Afghanistan, Bangladesh, Cambodia, Lao People's Democratic Republic, Mongolia and Nepal have been supported to review their legislation and regulations. Bangladesh is currently engaged in strengthening its food safety authority that was set up in 2015 after the passage of an updated Safe Food Act in 2013. The Bangladesh Food Safety Authority is being supported to review, analyse and draft new food regulations on risk-based principles. The food regulations developed include those on food additives and contaminants, food hygiene and food labelling. A participatory consultative process aimed at bringing greater transparency in their development and implementation with the involvement of the private sector and consumer organizations has been activated. A comprehensive capacity-building programme has been established to train inspectors, laboratory analysts, extension officers, farmers' groups and value chain actors in good practices for food safety. Data collection systems on food-borne illnesses and monitoring of residues have been set up. An undergraduate Bachelor's degree programme in food safety and regulatory affairs is expected to be approved shortly, with the first intake of students in 2018. Street-food safety was addressed in selected urban areas by introducing a registration procedure for vendors, training vendors in good hygiene practices and working with civic authorities to provide clean locations and develop a registration procedure which rendered the vendors amenable to monitoring. As civic bodies have limited human resource capacities, monitoring was delegated to schools and educational institutions. Students and teachers act as a friendly regulator of food safety and ensure constant improvement, with the civic bodies only stepping in if the vendors are recalcitrant and unwilling to improve.²⁹

15. FAO and WHO have designed an assessment tool for food control systems based on Codex principles and guidelines, as well as guidance on its application. This is to be used by member countries to develop a status report on their current system and determine gaps and key capacity-building requirements. The latest and most updated version of the tool has been implemented in Indonesia and is available for use in other countries to take stock of their food control systems. Earlier

²⁸ Codex Alimentarius Commission GL-82. 2013. Principles and guidelines for national food control systems.

²⁹FAO. 2014. The Street Food Initiative in Khulna [available at <http://www.fao.org/in-action/food-safety-bangladesh/news/detail/en/c/411752/>].

versions have been used to perform the assessment in Mongolia, Myanmar, Sri Lanka and Viet Nam. The information collected through this all-inclusive tool provides an internal benchmark for the country. The recommendations of the assessment can be used to formulate a plan of action to strengthen weak points and achieve key food safety objectives. The results of such assessments are currently being used to develop technical assistance programmes in these countries. Knowledge products and documents on inter-ministerial coordination, evidence-based decision-making and policy development using multicriteria approaches have been developed to support consultative processes to strengthen food safety.^{30,31}

16. Ensuring food safety by managing risks in agricultural production and post-production processes is essential to provide safe food to consumers. In Viet Nam, FAO enhanced the technical capacity of the country to analyse and overcome SPS issues that were negatively affecting domestic and international trade in the vegetable sector. Viet Nam is ranked third in vegetable production in the world, after China and India. The major problems facing the sector were the excessive use of pesticides and agricultural chemicals and the lack of awareness and application of good agricultural practices at the farm level. FAO supported the development of the knowledge base through market surveys on international market opportunities for specific vegetables grown in Viet Nam and the determination of the SPS requirements for the target commodities in specific markets. FAO also delivered a capacity-building programme to improve the safety and quality of vegetables using a value chain approach, and improved market linkages between producer organizations and domestic and international markets through buyer and supplier platforms. Similar support was provided to Nepal to access export markets by improving the quality of fresh ginger. This was done by improving ginger production and storage practices, addressing SPS issues and establishing a washing and processing facility through collaboration between public and private sectors. In Mongolia, an FAO SSC project facilitated the setting up of a Hazard Analysis and Critical Control Points (HAACP) working group and promoted safe food storage and marketing.

17. Smallholder farmers are present in huge numbers in Asian economies. They are a critical part of Asian food systems and no strategy for enhancing food safety can succeed without investing in them. In this context, it becomes important that they are organized into associations or cooperatives, adopt global best practices for food safety, ensure a consistent and reliable supply of produce, and link with markets to obtain good returns on their investment. The lack of awareness of controls that can be implemented by them and other actors across the food chain through to retailers is reflected in inadequate food hygiene and sanitation standards and regimes, and high levels of food contamination and adulteration. Many of the actors involved are not in a position to implement HACCP- or GMP-based approaches. The lack of regulation of the quality of the inputs resulting in, for instance, unregistered, unlabelled or diluted pesticide formulations is partially responsible for their overuse and consequent contamination of products. A range of SPS issues is also the result of: the meagre use of good practices after harvest; the lack of appropriate storage measures such as cold chains for fish and meat; the excessive use of antibiotics for animal health, leading to antimicrobial resistance (AMR) along the food chain; the deliberate addition of agents such as colours to increase the attractiveness of the product; and the overuse and abuse of chemicals to encourage ripening of fruits during storage as well as to keep away pests and rodents but inadvertently tainting the product.

18. To assist smallholders and other participants in agriculture value chains, FAO is continuously developing codes of practice based on hazard assessments in countries and Codex documents.³² These provide pragmatic directions for ensuring safety and compliance with regulations and are delivered through train-the-trainer and farmers' field school approaches. Where value chain actors do not have

³⁰ FAO. 2015. Report on the regional consultation on inter-ministerial consultation on enhancing food safety. [available at <http://www.fao.org/3/a-i4905e.pdf>].

³¹ FAO. 2018. Food safety risk management: Evidence-informed policies and decisions, considering multiple factors. [available at <http://www.fao.org/3/i8240en/I8240EN.pdf>].

³² Codex Alimentarius Commission RCP 1-1969. 2003. General Principles of Food Hygiene.

access to food safety technologies, simple innovations such as integrated pest management measures and use of vermi-compost and provision of useful intervention materials such as food grade containers or chlorinated water can result in substantial improvements to food safety and quality. These modules for safe value chains are combined with those on agribusiness practices to ensure that business benefits accrue to the smallholder and food safety benefits to the consumer. Such value chains can be made nutrition-sensitive by connecting the producers with consumers who demand safer, healthier, more convenient and environmentally friendly products.

19. Globally, the demand for certified food and agricultural products is rising and this has led to a growing number of voluntary standards for food safety. Implementing Good Agriculture Practices (GAP) from on farm production to post-production resulting in safe agricultural products is of immense importance from the food safety and trade perspectives. Many importing countries as well as domestic buyers, notably organized retailers, require producers to implement GAP as a prerequisite to assure product quality and safety as well as sustainable production and environmental health. In response to the request of countries in the SAARC region, FAO provided technical assistance to develop a regional GAP standard (along the lines of ASEAN GAP) and its certification scheme; set up the knowledge based infrastructure required for its implementation including identification of the scheme owner and certifying body and building their capacities; and linked the scheme with a national or regional accreditation body. The standard and the certification scheme³³ was piloted in Bangladesh, Bhutan, Maldives and Nepal. This infrastructure has been institutionalized through the establishment of relevant committees and notification of the standards in national documents. The adoption of private and voluntary codes of practice, standards that are consistent with Codex, certification schemes and the facilitation of supply chain management and market access through good agribusiness practices contributes greatly to domestic and international trade. It expands the trust of the domestic supply base capacity by better linking local producers to modern value chains, while ensuring compliance with stringent quality and safety standards. The cost of obtaining this certification is significantly less than for other private and voluntary certification schemes and also ensures the availability of safe food for domestic and foreign consumers.

20. There is also a need to generate evidence on key hazards and to strengthen risk-based food control including regulations exists in the Pacific islands. The increasing amount of data on ciguatera poisoning cases and their epidemiology^{34,35} will provide the basis for assessing risks, setting MRLs and implementing good practices along supply chains. An FAO-supported study in Samoa on microbiological risks in selected leafy green vegetable chains showed the presence of microbes attributable to unclean water at farm level, contamination during distribution, poor storage conditions and insufficient awareness of food safety along the chain.³⁶ Food imports have become an increasingly important source of food availability in most small island developing states (SIDS). Both nutritional quality and safety of imported foods are a concern. In this regard, FAO is: working with governments in the subregion to strengthen food safety legislation and regulations (Federated States of Micronesia, Kiribati, Nauru, the Marshall Islands, Solomon Islands and Tonga); establishing a food division in the Ministry of Agriculture in Tonga; carrying out food safety risk assessments in Samoa; and developing guidelines and codes of practice for hygienic street-food vending and building capacity of food testing laboratories in the Solomon Islands.³⁷ In this regard, the work of other development partners provides valuable information and entry points. A voluntary national reporting system of public health

³³ FAO. 2017. A scheme and training manual on GAP for fruits and vegetables [available at <http://www.fao.org/3/a-i5739e.pdf>]

³⁴ FAO. 2004. Marine biotoxins. [available at <http://www.fao.org/docrep/007/y5486e/y5486e0q.htm>].

³⁵ AECOSAN.2015. Risk characterization of ciguatera food poisoning in Europe [available at http://www.aecosan.mssi.gob.es/AECOSAN/web/ciguatera/home/aecosan_home_ciguatera.htm].

³⁶ Asora-Finau, K et al. 2014. Technical completion report of a USAID-funded project on developing analytical methods for histamine, mercury and lead in fish and related products.

³⁷ FAO.2017. FAO with local authorities and partners tackling food safety across the Pacific. [available at <http://www.fao.org/asiapacific/news/detail-events/en/c/1042995/>].

outbreaks of acute gastroenteritis (AGE) was implemented in the USA and the island of American Samoa, as well as in Micronesia, Marshall Islands and Palau³⁸, and the data serve as a useful reference. The WHO Regional Office for the Western Pacific has developed the regional food safety strategy and partnering with them in its implementation would be useful to strengthen food safety capacity and awareness in the subregion.³⁹

21. In the retail sector, FAO recognizes the role that millions of micro, small and medium enterprises play in the provision of food services. Guidance has been developed on hygiene and safety in 12 sectors (including meat, fish and catering) and a regional network is being set up to facilitate continuous improvement in the food retail sector. One of the key challenges in the Asia-Pacific region is the presence of a huge number of wet markets. They are usually characterized by insufficient biosecurity measures, inadequate hygiene and sanitation facilities and low awareness among market operators and consumers. The markets are a fount of microbiological and chemical hazards that cause multiple illnesses such as diarrhoea and cholera as well as zoonotic diseases. Recent studies have also shown the occurrence of AMR strains.⁴⁰ However, limited surveys to generate scientific evidence, develop codes of practice and build capacity of urban and civic authorities, market operators, vendors and civil society can significantly improve the markets and the surrounding environment. These markets are prime locations for the implementation of a One Health strategy promoted by FAO which could also be the kick-off point for their transformation and upscaling in collaboration with international financial institutions.

22. In 2018-2019, the One Health Regional Initiative will be rolled out to demonstrate and document benefits accruing to plant, animal, human and ecosystem health through a multidisciplinary approach in agriculture and nutrition in the Asia-Pacific region. Increased prosperity in the region is changing the way people eat. There is greater reliance on processed, ready-to-eat foods as well as street food. This adds more steps to the food chain and increases the risks (whether they occur during production or post-production, transport, storage, processing, retail, preparation or consumption) to consumer health. They also influence the nutritional content and quality. The demand for packaged food and increased trade in turn promote crop, fish and animal monocultures (for instance, potatoes, carp and chickens of the same variety or breed, uniform size, shape and weight) and reduced diversity. This renders production systems more susceptible to pest and disease outbreaks and more vulnerable to climate change. Mainstreaming food safety and nutrition and greening agriculture and food systems will be key features of the Regional Initiative.

23. The crowding of people and animals in small areas is increasing the risk of zoonotic transmission. In early 2017, the Centres for Disease Control and Prevention reported the death of a patient who was infected with a bacteria in Asia that was resistant to 26 common antimicrobials used in the USA.⁴¹ Should such a bacteria spread in the environment or even mutate further, large populations could be wiped out. This could be a possible scenario for countries such as Bangladesh, which has large populations of livestock and high levels of human–animal proximity and movement. The One Health approach will address these and related challenges to food safety and all-round health, such as air and water pollution, chemical exposure, biodiversity loss and ecosystem degradation through a broad-based approach and not only sector-specific technical fixes.

³⁸ Centres for Disease Control and Prevention MMWR. 2015. Outbreaks for acute gastroenteritis transmitted by person-to-person contact, environmental contamination, and unknown modes of transmission- United States, 2009-2013. Surveillance Summaries, 64(12).

³⁹ WHO. 2017. Regional Framework for Action on Food Safety in the Western Pacific [available at http://www.wpro.who.int/about/regional_committee/68/documents/wpr_rc68_10_annex_food_safety.pdf?ua=1&ua=1].

⁴⁰ Al Mamun *et al.* 2017. African Journal of Microbiology Research. 11:474-481.

⁴¹ CDC. 2016. Notes from the Field: Pan-Resistant New Delhi Metallo-Beta-Lactamase-Producing *Klebsiella pneumoniae* — Washoe County, Nevada. [available at <http://bit.ly/2DBpxJu>].

24. The SDGs chart a path towards meeting current needs without compromising the ability of future generations to meet theirs. Food safety directly contributes to SDG 2 to 'End hunger, achieve food security and improved nutrition, and promote sustainable agriculture', and SDG 3 to 'Ensure healthy lives and promote well-being for all at all ages'. In addition, food safety contributes indirectly to other SDGs, including: ending poverty; gender equity; universal water and sanitation; responsible production and consumption; and managing climate change. However, food safety indicators have not been identified among the 230 indicators for the SDGs. Many countries have expressed a strong need for establishing such indicators in order to develop a systematic mechanism to track progress as they strive to modernize and improve their national food control systems. A lack of food safety indicators also means that it is not possible to identify priority areas and allocate financial and human resources to manage and mitigate food safety risks. FAO's latest initiative in the Asia-Pacific region is to prepare a list of potential indicators in consultation with experts and countries and validate some of them in selected countries. A pool of 40 potential indicators includes: institutional ones such as the presence of competent authorities backed by law; infrastructural pointers such as the availability of potable water; knowledge-based indicators such as residue monitoring and emergency response plans; and sector-specific warning signs such as the incidence of *Salmonella* in food. Guidance on these indicators, including the methodology for data collection and analysis, is being developed for validation at country level. This work will be executed in collaboration with WHO, World Bank and the World Organisation for Animal Health (OIE).

25. Improving food safety has a wide range of beneficial effects on public health, nutritional status and productivity of populations. It can accelerate access for millions of smallholder farmers and other actors to domestic and export markets. It is very important for tourism and links the reputations of countries with the food that they produce and serve. The diverse foodscapes and economies of Asia and the Pacific, urbanization, migration, and climate and technological change provide a unique set of challenges that can only be surmounted by constant improvement. Such improvement includes updating laws and regulations, upgrading capacities and capabilities to assess compliance with national and international requirements, increasing interagency cooperation within countries and outside, and delegating more responsibility to the private sector for implementing food safety with smart oversight from government. Moreover, SSC & TrC offers a broad framework for collaboration among developing countries to deliver cost-effective solutions. FAO is already facilitating exchanges of experiences and know-how by supporting the placement of more than 2 000 experts in food and agriculture to more than 80 countries around the world. Transfer of knowledge and technologies related to food safety, good practices and long-term capacity building through courses and e-learning can be facilitated particularly between Asia and the Pacific subregion. Ministers are invited to advise FAO on areas of focus in the development of national capacities in core technical areas of food safety and on cohesive actions to harmonize food safety standards in the Asia-Pacific region to safeguard public health and promote trade. Ministers are also requested to recommend ways to maximize One Health outcomes and ensure delivery of safe and nutritious foods to the consumer at local level.