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FAO REGIONAL CONFERENCE FOR ASIA AND THE PACIFIC

Thirty-fifth Session

1-4 September 2020¹

Building sustainable and resilient food systems in Asia and the Pacific

Executive summary

The traditional approach to achieving food security concentrates actions on increasing agricultural production so that consumers may have access to more affordable food. This approach was epitomized by the Green Revolution and, in combination with broad-based economic growth, it has enabled many countries in the region to significantly reduce food insecurity.

The limitations of the production-centric approach, however, are now becoming apparent. Despite significant reductions in poverty and a rise in per capita incomes, countries in Asia and the Pacific region are wrestling with the multiple burden of malnutrition. A narrow focus on grain production has inadvertently made calories cheap and nutrients expensive, while also degrading the environment and making the food system more susceptible to shocks. This is being compounded by climate change and added pressure on land and water owing to industrialization and urbanization.

The need for a food system approach that recognizes and analyses the relationship among sustainable use of natural resources, agriculture, food, nutrition and resilience is now well recognized. The Framework for Action of the Second International Conference on Nutrition² recommended the adoption of a sustainable food-systems approach, which can provide a more effective basis for action. Examples of specific policies and measures involving a range of public and private institutions will be used to highlight the potential benefits of the approach, while also illustrating challenges and trade-offs that will need to be addressed if these benefits are to be realized.

Delegates are in a unique position to contribute to food system transformation that can deliver healthy diets in ways that are compatible with the three pillars of sustainable development. They are invited to share their experiences with policies and programmes and the technical and institutional challenges associated with developing and implementing a range of interventions that cover the various components of sustainable and resilient food systems.

Suggested action by the Regional Conference

¹ Rescheduled from 17-20 February 2020, Thimphu, Bhutan

² FAO/WHO. 2016. Framework for Action of ICN2. [<http://www.fao.org/3/a-mm215e.pdf>]

- Advise on priority areas and issues for analysis on how to implement food-system transformation projects in member countries.
- Provide guidance on how to develop interventions that reach across multiple public- and private-sector actors, identifying potential trade-offs as well as strategies for managing them, and mainstream the approach into national planning processes.
- Take note of FAO's undertakings, in connection with the preparatory process for the United Nations Food Systems Summit 2021, to develop innovative, evidence-based and analytical approaches to food system policy and governance and to improve targeting for investment and innovation.
- Provide input from regional bodies (such as the Association of Southeast Asian Nations [ASEAN] and the South Asian Association for Regional Cooperation [SAARC]) that have prioritized the creation of sustainable, resilient food systems for food and nutrition security.
- Share additional country-level experiences with promoting more sustainable food systems.

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Introduction

1. The High Level Panel of Experts on Food Security and Nutrition (HLPE) of the Committee on World Food Security (CFS) defined a food system as encompassing all the elements (i.e. environment, people, inputs, processes, infrastructures and institutions) and interlinked activities that relate to the production, processing, distribution, preparation and consumption of food and the outputs of these activities including socio-economic and environmental outcomes.³ The food system wheel framework is centered around achieving poverty reduction, food security and improved nutrition, which are FAO's main goals (Figure 1).⁴ These are embedded in the broader performance of the system, referring to the three dimensions of sustainability: economic, social, and environmental (Figure 2).⁵ Such performance is people-centric, i.e. it is determined by the behaviour of diverse actors or the conduct of stakeholders in the food system. This conduct in turn takes place in the structure of the system, which consists of a core with societal and natural elements. The core system includes a layer of activities through which food products flow (production, aggregation, processing and consumption, including waste disposal) and a layer of services, which support the flow. These activities are embedded in a societal context and a natural environment. The former includes all related policies, laws and regulations, sociocultural norms, infrastructures and organizations. The latter includes water, soils, air, climate, ecosystems and genetics.

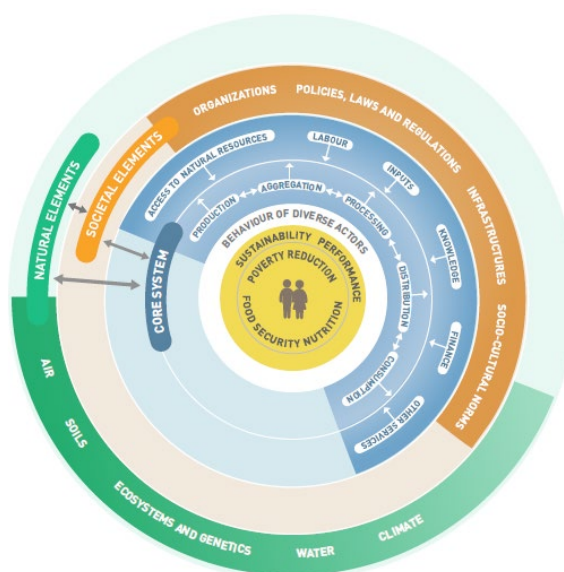


Figure 1. The food system wheel

Source: FAO. 2018. Sustainable Food Systems – Concept and Framework.

[<http://www.fao.org/3/ca2079en/CA2079EN.pdf>]

2. A sustainable food system delivers food security and nutrition for all in a way that will not compromise the economic, social and environmental bases to generate food security and nutrition for future generations. The adoption of such a food-systems approach helps to reflect on the shortcomings of past approaches, which have focused narrowly on food production, and to identify more balanced and holistic policies and programmes to achieve the desired outcomes. The food system is composed of

³ HLPE. 2017. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome. [<http://www.fao.org/3/a-i7846e.pdf>]

⁴ FAO. 2018. Sustainable food systems – concept and framework. [<http://www.fao.org/3/ca2079en/CA2079EN.pdf>].

⁵ FAO. 2014. Sustainable food value chain development – guiding principles. Rome. [<http://www.fao.org/3/a-i3953e.pdf>].

subsystems (e.g. farming, waste management, input supply, food safety and others) and interacts with other key systems (such as energy, trade and health). Therefore, a structural change in the food system might originate in a subsystem and perturb the whole food system; for example, a policy that promotes nutrition-sensitive agriculture or diversification will have a significant impact on the food system (Figure 2). The objective is to create change that delivers broad-based benefits for society and has a positive or neutral impact on the natural environment.

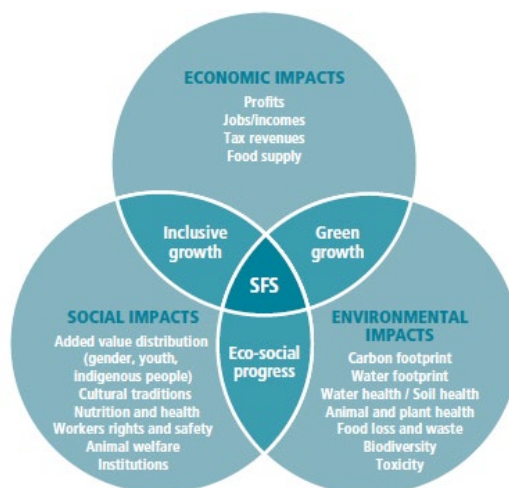


Figure 2. Sustainability in food systems

Source: FAO. 2018 adapted from FAO, 2014. Sustainable Food System - Concept and Framework.

[<http://www.fao.org/3/ca2079en/CA2079EN.pdf>]

3. Resilience is a crucial complementary and integrated feature of sustainable food systems, given the multiple risks to the systems. Shocks, large-scale but also small and recurrent, can impact many elements of food systems, causing productivity loss, disruptions in markets, increased price volatility and overall system instability which tend to affect the most vulnerable and food-insecure in greater measure. Therefore, policies, technologies, practices and partnerships that increase the capacity of food systems to anticipate, absorb and accommodate shocks or to manage the risks or recover from them are necessary to foster more sustainable food systems.⁶ Steps to build resilience can be deployed at multiple levels and require integrated measures involving risk assessment, governance, ecosystem-based risk reduction and climate change adaptation, gender equity, nutrition-sensitive social protection and others.

The need for a sustainable and resilient food-systems approach in Asia and the Pacific region

4. Agricultural policies have achieved considerable success in improving the food security situation in the region over the last few decades. The sector benefited enormously from increased public investment, including economic incentives, improved extension services and enhanced rural infrastructure. Reforms that improved land-tenure arrangements, access to credit and economic incentives in agriculture unleashed a transformation in agriculture. This, in turn, stimulated broad-based economic growth that led to dramatic increases in productivity, poverty reduction and declining levels of food insecurity and made Asia and the Pacific region the fastest-growing region of the globe. The establishment of the World Trade Organization (WTO) and blocs such as the Asia-Pacific Economic Cooperation (APEC), the Association of Southeast Asian Nations (ASEAN) and the South Asian Association for Regional Cooperation (SAARC) boosted domestic, regional and international trade.

⁶ Loconto, A., Jenkin, N., Pavageau, C., Golan, E., Gould, D., Dernini, S., Campeau, C., *et al.* 2018. Draft - Towards a common understanding of sustainable food systems. Key approaches, concepts and terms. One Planet Sustainable Food Systems Programme.

5. There have been, however, unintended consequences of the success of these policies. Despite posting the highest growth rates in gross domestic product in the last few decades, countries in the region suffer from at least one or more forms of malnutrition (i.e. undernutrition, micronutrient deficiency or hidden hunger, and overweight and obesity). The number of undernourished people in the region in 2018 was estimated at 479 million, which was 58 percent of the global total. Within the region, South Asia had the most undernourished people (279 million), followed by Eastern Asia (137 million), South Eastern Asia (61 million) and Oceania (3 million).^{7,8} In East Asia and Pacific, 13 million children under five years of age are stunted and 4.5 million are wasted, while in South Asia 64 million children under five are stunted.^{9,10} Six of the top 11 risk factors driving the global burden of disease are related to diet, according to a global analysis.^{11,12} Recent results from a ten-year study of 667 communities from 18 countries, six of which were from Asia and the Pacific region, found that the costs of fruits and vegetables are particularly high relative to average household income and are unaffordable for large proportions of the population, particularly in lower-middle-income and lower-income countries. These findings imply inequality in access to the foods necessary for healthy diets (e.g. fruits and vegetables) between higher- and lower-income communities and between urban and rural populations.¹³ Many countries in the region, and particularly countries with lower gross domestic product per capita, have been found to have average fruit and vegetable availability that is insufficient to allow for nutrient intake at recommended levels. Dietary risks associated with a diet with low average consumption of foods such as fruits, vegetables, legumes, nuts, seeds and whole grains are leading causes of death and health loss across the region.¹⁴

6. It is clear that current agriculture and food systems are not delivering healthy diets. Moreover, other factors are at work in Asia and the Pacific region. Since 2018, more people are living in urban areas than rural areas; in fact, 2.1 billion people are urban residents, which is 60 per cent of the world's urban population.¹⁵ By 2021, more than half of the region's population will live in urban areas owing to rural-to-urban migration and the expansion of urban areas. This is changing the food environment and the types of food that consumers can access conveniently. There is substantial increase in the availability and consumption of heavily processed foods that are high in salt, sugar or fat, and this is elevating obesity rates. This calls for whole system solutions that address the factors underlying this transition rather than those that deal with only its manifestations as changes in lifestyle and dietary habits.

⁷ FAO. 2019. The state of food security and nutrition in the world
[<http://www.fao.org/3/ca5162en/ca5162en.pdf>]

⁸ FAO. 2019. Asia Pacific regional overview of food security and nutrition (*to be published*)

⁹ UNICEF. 2019. State of the World's Children – East Asia and Pacific

[<https://www.unicef.org/eap/media/4171/file/SOWC%202019%20East%20Asia.pdf>]

¹⁰ UNICEF. 2018. <https://www.unicef.org/rosa/stories/stop-stunting-south-asia-part-1>

¹¹ GLOPAN. 2016. Food systems and diets: Facing the challenges of the 21st century. London, UK

[<https://www.glopan.org/wp-content/uploads/2019/06/ForesightReport.pdf>]

¹² Forouzanfar, M.H., Alexander, L., Anderson, H.R., Bachman, V.F., Biryukov, S., Brauer, M., Burnett, R., *et al.* 2015. Global, regional and national comparative risk assessment of 79 behavioural, environmental and occupational and metabolic risks or clusters of risks in 188 countries, 1990–2013: A systematic analysis for the Global Burden of Disease Study. *The Lancet*, 386, 2287–323,

¹³ Mason-D'Croz, D., Bogard, J.R., Sulser, T.B., Cenacchi, N., Dunston, S., Herrero, M., Wiebe, K. 2019. Gaps between fruit and vegetable production, demand, and recommended consumption at global and national levels: an integrated modelling study. *Lancet Planet. Heal.* 3, e318–e329. Countries covered in the study were grouped by World Bank Classifications in 2006 on the basis of gross national income per person. Lower-income countries: Bangladesh, India, Pakistan and Zimbabwe. Lower-middle-income countries: China, Colombia, Iran (Islamic Republic of) and Palestine. Upper-middle-income countries: Argentina, Brazil, Chile, Malaysia, Poland, South Africa and Turkey. High-income countries: Canada, Sweden and United Arab Emirates.

¹⁴ Afshin, A., Sur, P. J., Fay, K. A., Cornaby, L., Ferrara, G., Salama, J. S., Mullany, E. C., *et al.* 2019. Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet* 393, 1958–1972.

¹⁵ ESCAP. 2017. Urbanization and sustainable development in Asia and the Pacific: linkages and policy implications. [https://www.unescap.org/commission/73/document/E73_16E.pdf]

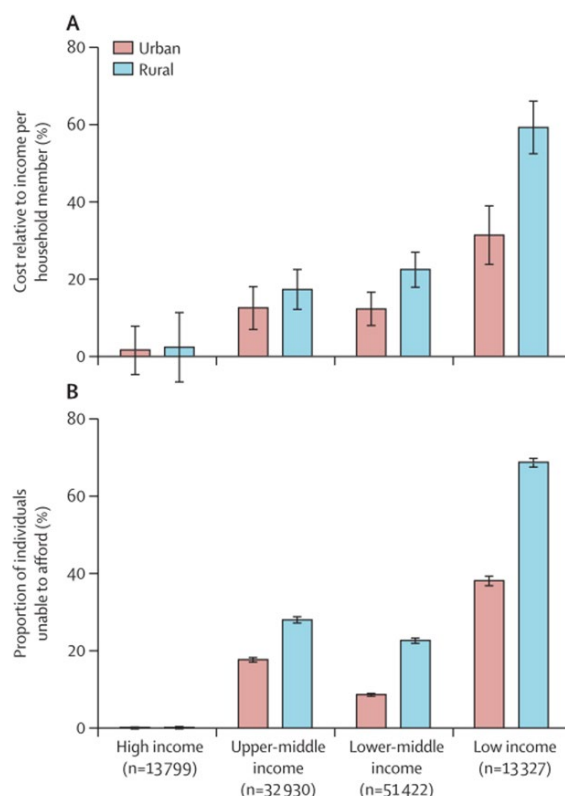


Figure 3. (A) Mean proportion of income per household member required to purchase three servings of vegetables and two servings of fruits per day and (B) proportion of individuals who were unable to afford three servings of vegetables and two servings of fruit. Error bars represent 95 percent CI. Source: Miller *et al.*, 2019. Availability, affordability, and consumption of fruits and vegetables in 18 countries across income levels: findings from the Prospective Urban Rural Epidemiology (PURE) study. *Lancet Glob. Heal.* 4, e695–e703.

7. The conversion of forests and wild ecosystems to intensive agricultural production was widely recognized as one of the leading drivers of biodiversity loss and climatic change in the last decade.¹⁶ Over the past few decades, there was significant deforestation to facilitate expansion of crop land and plantations in tropical areas of the region, particularly in Southeast Asia. In other parts of the region, grasslands have been heavily degraded due to overgrazing, invasive species and agricultural expansion.¹⁷ Much of this activity can be linked to a few key commodities (e.g. industrial palm oil) as well as other commodities including pulp, rubber and timber.^{18,19} Recent trends in land-use change also have been found to be strongly linked to nutrition transitions and increasing demand for the food and agriculture products that are more common in the region's rapidly growing urban areas.^{20,21} While rates

¹⁶ Millennium Ecosystem Assessment, 2005. Ecosystems and Human Well-being: Biodiversity Synthesis. World Resources Institute, Washington, DC.

[<https://www.millenniumassessment.org/documents/document.354.aspx.pdf>]

¹⁷ IPBES. 2019. Summary for policymakers of the regional assessment report on biodiversity and ecosystem services for Asia and the Pacific of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

¹⁸ Vijay, V., Pimm, S. L., Jenkins, C. N., Smith, S. J. 2016. The Impacts of Oil Palm on Recent Deforestation and Biodiversity Loss. *PLoS One* 11(7).

[<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0159668>].

¹⁹ Gibbs, H. K., Ruesch, A. S., Frederic, A., Clayton, M. K., Holmgren, P., Ramankutty, N., Foley, J. 2010. Tropical forests were the primary sources of new agricultural land in the 1980s and 1990s. *Proceedings of the National Academy of Sciences*. U. S. A. 107, 16732–16737.

²⁰ Defries, R. S., Rudel, T., Uriarte, M., Hansen, M. 2010. Deforestation driven by urban population growth and agricultural trade in the twenty-first century. *Natural Geoscience*. 3, 178–181.

²¹ Meyfroidt, P., Lambin, E. F., Erb, K., Hertel, T.W. 2013. Globalization of land use: Distant drivers of land change and geographic displacement of land use. *Current Opinion in Environmental Sustainability* 5, 438–444.

of deforestation have moderated, land-use change and degradation continue to be among the largest sources of greenhouse gas emissions at the regional level.²²

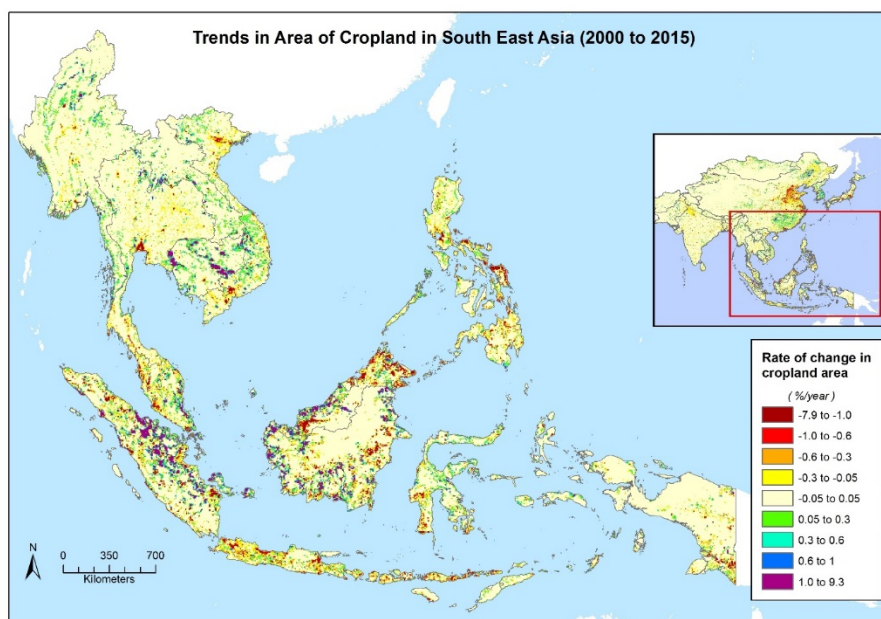


Figure 4. Mean changes in cropland area in Southeast Asia, 2000-2015, calculated using the 300 m annual global land cover maps.

Map prepared by: IWMI. Data source: Hansen *et al.* 2013

Note: Tree cover includes all vegetation exceeding 5 m in height: natural forests and plantations across a range of canopy densities aggregated from remote sensing based assessments at 30 m resolution

8. Water stress and scarcity is prevalent in many key agricultural production areas in the region. Irrigation withdrawals for food production exceed those needed to maintain the health of key river systems including the Indus River in Pakistan, the Yellow River in China and the Ganges in India.²³ High levels of groundwater extraction encouraged by subsidies for electricity and irrigation infrastructure, particularly in South Asia, are potentially degrading an important buffer for managing water stress and scarcity. Subsidies for fertilizers targeting increases in productivity have created pollution and inefficient resource use with negative flow-on effects for land and water resource quality, food safety and human health. Although intensification of production has increased, food losses and waste along the value chains of cereals, fruits, vegetables, meat and fish are also high, implying lost nutrition and energy as well as considerable embedded emissions and resource consumption.²⁴

²² FAO. 2018. Dynamic development, shifting demographics, changing diets.

[<http://www.fao.org/3/I8499EN/i8499en.pdf>].

²³ Jagermeyr, J., Pastor, A., Biemans, H., Gerten, D. 2017. Reconciling irrigated food production with environmental flows for Sustainable Development Goals implementation. Nature Communications.

[<https://www.nature.com/articles/ncomms15900>]

²⁴ FAO. 2013. Food wastage footprint: Impacts on Natural Resources. [<http://www.fao.org/3/i3347e/i3347e.pdf>].

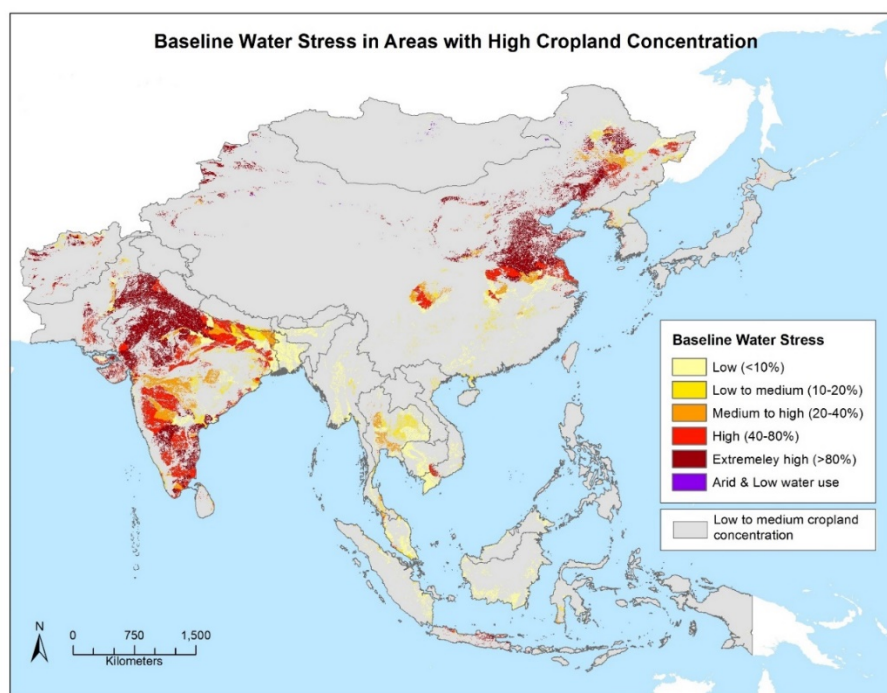


Figure 5. Water stress²⁵ in areas of high cropland concentration (cropland concentration > 90 percent). Map prepared by: IWMI. 2018. Data sources: Global Food Security-support Analysis Data @ 30-m (GFSAD30) Cropland Extent. 2015. and WRI Aqueduct. 2014.

9. Intensification and land-use change due to expansion have been the most significant driver of biodiversity loss globally and regionally over the past five decades.²⁶ Almost a quarter of the region's endemic species are threatened with extinction. Degradation and fragmentation of natural habitats resulting from forest loss is a key underlying driver of this process. Globally, fewer than 200 plant species currently make contributions to food production globally, regionally or nationally.²⁷ This bears stark contrast to the approximately 7 000 plant species and several thousand animal species that have contributed to diets since the Neolithic age and have adapted to harsh environments and climatic conditions. Studies have found that diverse foods available from forests and wild ecosystems are an important source of resilience in the food system and are also positively correlated with healthy diets.²⁸

10. The loss of biodiversity, dependence on a few staples, and erosion of natural resources has reduced the resilience of food systems and the capability to respond to natural and human-made shocks. Asia and the Pacific region is particularly susceptible to climate-related extremes and associated risks to food system stability,^{29,30} and an increasing number of climate-related extreme events is exacting a significant human and economic toll.³¹ Floods, droughts and cyclones in the region reportedly produced economic losses of over USD 89 billion in 2018. There is mounting evidence that human-driven climate

²⁵ Total annual water withdrawals (municipal, industrial, and agricultural) expressed as a percent of the total annual available flow. Higher values indicate more competition among users.

²⁶ Balvanera, P., Pfaff, A., Vina, A., Frapolli, E. G., Hussain, S. A., Merino, L., Minang, P. A., *et al.* 2019. The IPBES Global Assessment on Biodiversity and Ecosystem Services. Chapter 2 . Status and trends ; indirect and direct drivers of change.

²⁷ FAO. 2019. The state of the world's biodiversity. [<http://www.fao.org/3/CA3129EN/CA3129EN.pdf>].

²⁸ Rasolofoson, R., Hanauer, M. M., Pappinen, A., Fisher, B., Ricketts, T. 2018. Impacts of forests on children's diet in rural areas across 27 developing countries. *Science Advances*, 4(8).

²⁹ Jongman, B., Ward, P. J., Aerts, J. 2012. Global exposure to river and coastal flooding: Long term trends and changes. *Global Environmental Change* 22, 823–835 (2012).

³⁰ Peduzzi, P., Dao, H., Herold, C., Mouton, F. 2009. Assessing global exposure and vulnerability towards natural hazards: the Disaster Risk Index. *Natural Hazards and Earth System Sciences*. 9, 1149–1159.

³¹ CRED. 2017. EM-DAT: International Disaster database. Centre for Research on the Epidemiology of Disasters [<http://www.cred.be/>]

change is driving the increased likelihood and intensity of extreme climate events.³² Growth in moderate climate extremes, such as increases in the numbers of warm days and nights, heatwaves and the incidence of intense rainfall at seasonal and daily time scales, also have been observed across the region.^{33, 34, 35, 36}

11. Climate-related and other disasters (e.g. protracted conflicts) affect nutrition and livelihoods by influencing people's food security, health risks, water and sanitation environments, and choices about how to allocate time to their livelihoods and to caregiving. A nexus and vicious interdependence exist among food nutrition insecurity, poverty, disaster and climate change, which keep populations poor and prone to frequent loss of livelihoods, food and nutrition insecurity, undernutrition and widening inequalities. Poverty leads to undernourishment, which in turn leads to low human development, impairs learning, impacts employment opportunities and further engenders probable poverty, particularly multidimensional poverty that is experienced by more than one in four people in the region's developing countries.

Countries have begun to invest in the sustainable and resilient food-systems approach

12. Adopting a sustainable and resilient food-systems approach will be vital to achieve the Sustainable Development Goals (SDGs) by 2030.³⁷ This requires partnership among governments, development partners, civil society, the private sector and other stakeholders. With technical advice from FAO, countries in the region are recognizing the importance of the approach and are adopting multisectoral frameworks for action. The experiences described below provide examples of efforts to tie elements of the food systems together and deliver benefits across multiple dimensions of sustainability and resilience.

Transforming food systems with policies and investment plans

13. In Bangladesh, the Food Planning Monitoring Unit (FPMU) in the Ministry of Food was established to monitor the food security and nutrition situation with research-based knowledge and evidence and provide timely information and quality advice to policy-makers on crucial interventions. This institutionalization helped the country weather the storm created by the food crisis in 2008–2009. Following this, the FPMU adopted a system-wide approach to food and nutrition security. The first country investment plan (CIP) for agriculture, food security and nutrition was formulated in 2011.³⁸ Through the CIP, the FPMU strengthened its partnerships with boundary partners or core ministries (i.e. food; agriculture; fisheries and livestock; women and children affairs and health; and family welfare). Technical documents that underpin nutrition (such as food-based dietary guidelines, food composition and consumption tables and analyses of dietary diversity patterns) were developed. As the double burden of malnutrition began to manifest itself despite robust economic growth, the successor investment plan

³²Heffernan, O. 2016. News feature: Climate research is gaining ground. *Nature Climate Change*. 6(4), 335–338.

³³Lehmann, J., Coumou, D., Frieler, K. 2015. Increased record-breaking precipitation events under global warming. *Climatic Change*. 132(4), 501–515.

³⁴Westra, S., Fowler, H. J., Evans, J. P., Alexander, L. V., Berg, P., Johnson, F., Kendon, E. J., Lenderink, G., Roberts, N. M. 2014. Future changes to the intensity and frequency of short-duration extreme rainfall. *Reviews of Geophysics*. 52(3), 522–555.

³⁵Westra, S., Alexander, L. V., Zwiers, F.W. 2013. Global increasing trends in annual maximum daily precipitation. *Journal of Climate*. 26(11), 3904–3918.

³⁶Alexander, L. V. 2016. Global observed long-term changes in temperature and precipitation extremes: A review of progress and limitations in IPCC assessments and beyond. *Weather and Climate Extremes*. 11, 4–16.

³⁷FAO. 2018. Sustainable Food Systems – Concept and Framework. [<http://www.fao.org/3/ca2079en/CA2079EN.pdf>]

³⁸Government of Bangladesh and FAO. 2011. Bangladesh Country Investment Plan

[http://www.fao.org/fileadmin/user_upload/faobd/docs/CIP/Bangladesh_Food_security_CIP_2011_Final_-_DG-3Aug.pdf]

(2016–2020)³⁹ is multisectoral and anchored around nutrition and food systems and achieving the SDGs. The dimension of climate change and its impact on the resilience of food systems was recognized with a separate CIP.⁴⁰ Furthermore, the four city corporations of the Dhaka metropolitan area are investing in the development of an urban food agenda by 2021 through the operationalization of a multistakeholder platform to assure food security, food safety and nutrition to all citizens as the city grows to become one of the world’s largest urban agglomerations.

14. In Indonesia, the highest policy-making body, the Ministry of National Development Planning, has embarked on a mindset-changing effort which recognizes the need to develop strategies that will transform food systems in the country through the new five-year National Development Plan (2020–2024). It is aimed at ameliorating food insecurity, combating all forms of malnutrition and incentivizing agriculture towards the production of healthy diets without compromising robust economic growth in rural and urban areas. FAO has engaged in this project as a pioneering initiative in developing food-systems thinking and institutions in a major member country. It is expected that this project will result in strengthening policies and regulations governing agriculture production, food chains, and the food environment (especially food safety) and integrating them to achieve sustainable outcomes for nutrition as well as the climate.

15. Food loss and waste has become a major global issue and is enshrined in SDG 12 (i.e. responsible consumption and production) along with specific targets related to its reduction.⁴¹ Reducing food loss and waste can be an inexpensive way of enhancing food security without having to increase production, especially in food-insecure countries when losses occur in the early stages of the food chain. SDG target 12.3 calls for halving per capita global food waste at retail and consumer levels by 2030 and reducing food loss (including post-harvest) along production and supply chains. With many countries recognizing the significance of this target and incorporating it into their national development plans, initiatives are now beginning to ensure better handling and storage and increase efficiencies along the chain. In India, the Food Safety and Standards Authority is revising food labelling regulations to allow greater flexibility by using “best by” dates rather than expiry dates in order to prolong shelf life.⁴² The same agency has developed a regulation to shield organizations that donate or redistribute surplus food safely.⁴³ China’s National Plan includes actions to substantially reduce per capita food wastes from farm-to-fork. Its “Clean Your Plate” campaign (also taken up by Singapore) is a major attempt to induce behaviour by turning public opinion against food waste and by enhancing collaborations with the hotel, restaurant and café sector.⁴⁴ In Thailand, the concept of sustainable consumption and production has been integrated into the National Economic and Social Development Plan (NESDP, 2017–2021) which follows the sufficiency economy philosophy of the late King Rama IX. Nepal’s National Action Plan aims to eradicate hunger by 2025 and emphasizes the establishment of cold chains, storage facilities and pack houses and the use of information technologies to minimize loss at each step of the supply chain. Two-thirds of all governments in the Asia-Pacific Economic Cooperation (APEC) provided public financial support in the form of loans, insurance or grants to businesses or non-profit organizations to implement measures aimed at reducing food loss or waste, making it the most widely used type of partnership.⁴⁵ Private-sector initiatives, including start-ups, are also providing an impetus. In Indonesia, the Food Loss and Waste Action Partnership aims to build a cross-sector programme to reduce food loss

³⁹ Government of Bangladesh and FAO. 2016. Bangladesh Second Country Investment Plan: Nutrition and food systems [<http://fpmu.gov.bd/agridrupal/sites/default/files/file/CIP2FinalPDFPrintedCopy.pdf>]

⁴⁰ Government of Bangladesh. 2016. Country investment plan for environment, forestry and climate change (2016–2022). [http://www.fao.org/fileadmin/user_upload/FAO-countries/Bangladesh/News/cip_final_printed_version.pdf]

⁴¹ FAO. 2019. State of Food and Agriculture. [<http://www.fao.org/3/ca6030en/ca6030en.pdf>]

⁴² <http://www.mondaq.com/india/x/846702/food+drugs+law/Food+Safety+Standards+The+International+Perspective+Usa+Canada+Japan+Singapore+And+India>

⁴³ [https://www.fssai.gov.in/upload/uploadfiles/files/Gazette_Notification_Surplus_Food_06_08_2019.pdf]

⁴⁴ Miroso, M. 2018. Content Analysis of the ‘Clean Your Plate Campaign’ on Sina Weibo, *Journal of Food Products Marketing*, 539-562. Note that the premise of the campaign is to take just enough food on the plate, not excess, and finish it.

⁴⁵ Shih-Hsun Hsu, T., Chang, C., Trang, N. T. 2018. APEC survey report on feasible solutions for food loss and waste reduction. Singapore, Asia-Pacific Economic Cooperation (APEC).

and waste in Indonesia by 50 percent by 2030.⁴⁶ In Singapore, the national food agency in collaboration with the service sector is conducting an intensive campaign to educate consumers and workers about reducing food loss and waste.

Mainstreaming disaster and climate risk management in agriculture for resilient food systems

16. The Philippines Department of Agriculture developed the Strategic Plan of Action on disaster risk reduction (DRR) in 2016 to mainstream DRR interventions throughout all key agricultural programmes. As a result, 20 percent of the department's total budget appropriations are earmarked for implementation of the Plan of Action to mitigate disaster impacts on agriculture/fisheries and food security. At the same time, the Philippines Adaptation and Mitigation Initiative in Agriculture (AMIA) enables local communities to manage climate risks while pursuing resilient livelihoods. Based on climate risk vulnerability assessments in ten regions, the initiative launches climate change adaptation and mitigation villages across the country while conducting climate change expenditure tagging. The agriculture sector also participates in the Risk Resiliency and Sustainability Programme led by the Department of the Environment and Natural Resources to strengthen disaster and climate resilience of natural ecosystems and the adaptive capacity of vulnerable groups and communities.

17. In Pakistan, FAO supports the development and implementation of a provincial and district Agriculture Disaster Risk Management Operational Plan in Sindh, Punjab and Khyber Pakhtunkhwa provinces, in line with the 2030 National Disaster Management Plan. These plans are now integrated into provincial and district Climate-Smart Agriculture Profiles and Climate-Smart Village Plans that are based on agro-ecological zones. They guide agriculture investments in the provinces while building farmers' capacities to scale up agriculture resilience building initiatives and climate-smart agriculture practices.

18. In Myanmar, the development of the Agriculture Action Plan on DRR at the national level and in selected states/regions was led by a DRR task force from the Ministry of Agriculture, Livestock and Irrigation (MOALI). The task force works under the overall guidance of the Department of Agriculture and the Department of Planning and is composed of different levels of management officers and technical staff from all MOALI departments. It was able to identify an initial budget and/or programmes from different departments/subsectors to implement the priorities of the Agriculture Action Plan on DRR.

Understanding linkages to develop multisectoral solutions

19. Unpacking the nexus of: (1) food insecurity, malnutrition, gender and poverty; (2) food, water and energy; or (3) poverty, disaster and climate change is instrumental for the development of integrated solutions that balance trade-offs (i.e. the double impacts of increasing food demand and climate change on water scarcity) and maximize synergies (i.e. addressing the common drivers of poverty and food insecurity). FAO studies in Bangladesh, Myanmar and Viet Nam in 2018 revealed that in all three countries, the poverty, disaster and climate change nexus is acknowledged in policy, strategy and planning documents, framed around common vulnerabilities that drive both poverty and exposure to disaster and climate risks. However, this acknowledgement either has not translated into specific policies and programmes or is backed by fiscal allocations that address the nexus as a "trinary" although there are initiatives to address the "binary" (i.e. poverty and disaster; disaster and climate change; or poverty and climate change). The studies suggest that the following approaches are useful in addressing the nexus: the building of sustainable livelihoods, comprehensive poverty-reduction programmes that also focus on reducing vulnerability to disaster and climate change; climate-smart agriculture; disaster- and climate-proof rural infrastructure; and sustainable natural resources management. The study in Viet Nam resulted in integrating disaster and climate change considerations in the planning of the National Target Programme for New Rural Development.

20. The 2019 *Asia and the Pacific Regional Overview of Food Security and Nutrition* shows that social protection – if designed with food security, nutrition and resilience-building objectives – can

⁴⁶ <https://p4gpartnerships.org/partnership/indonesia-food-loss-and-waste-action-partnership>

provide an effective platform for multisectoral approaches needed to address the social and economic determinants of food insecurity and malnutrition, contributing to food access and utilization as well as food availability both in normal times and during crises (Figure 6).⁴⁷

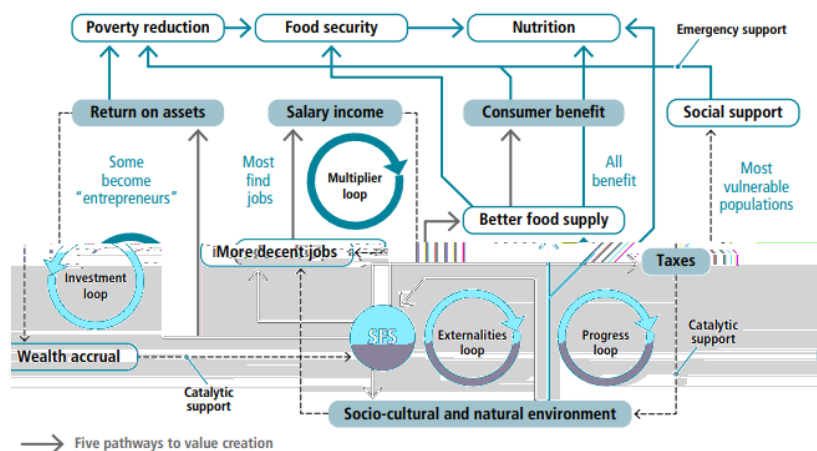


Figure 6. The food system development paradigm.

Source: FAO, 2018 adapted from FAO, 2014. Sustainable Food Systems – Concept and Framework [<http://www.fao.org/3/ca2079en/CA2079EN.pdf>]

21. Social transfers can also help increase dietary diversity in participating households, with households consuming a wider range of food groups and shifting towards healthier, more nutritious foods. A recent meta-analysis found that, on average, social protection programmes increase the value of food consumed/expenditure by 13 per cent and calorie acquisition by 8 per cent.⁴⁸ After the earthquake in Nepal in 2015, 81 per cent of the beneficiaries used their transfers to buy food, and 45 per cent used them to buy medicines. About two-thirds of beneficiaries lived in households with at least one child; thus, the shock response through the social protection system benefited those most vulnerable to a lack of food security and nutrition.⁴⁹ In Fiji, topping up social protection programmes in response to Cyclone Winston in 2016 gave beneficiaries access to more nutritious and diverse food baskets. Food was the main expenditure, and the average food consumption score was 65.7 percent (“acceptable”). An evaluation found that households receiving cash top-ups recovered faster from the effects of the disaster compared with non-recipients, reducing reliance on coping strategies detrimental to food security and nutrition.⁵⁰

22. In the Philippines, the approach of complementing cash transfers with agriculture interventions and training to set up microenterprises through public-private partnerships helps beneficiaries of two programmes (the Pantawid Pamilyang Pilipino Programme, a conditional cash transfer programme, and the Listahanan national household targeting registry) to invest in productive assets; engage in risk reduction and resilience-building practices such as climate-smart agriculture and natural resources

⁴⁷ The core components of social protection include: social transfers (both “contributory”, such as compulsory social insurance, pension fund schemes or voluntary social insurance for the informal sector and “non-contributory” such as social assistance targeted to the poor like non-conditional and conditional cash transfers or universal child support); social support and care services; programmes to ensure economic and social access to services (e.g. birth registration, health insurance, exemption and subsidies); and legislation and policies to ensure equity and non-discrimination in access to services and employment/livelihood. Authors of SOFI 2019, adapted from ILO and UNICEF.

⁴⁸ Hidrobo, M., Hoddinott, J., Kumar, N., Olivier, M. 2018. Social protection, food security, and asset formation. *World Development*. 101:88-103.

⁴⁹ Mertens *et al.*, 2017.

Evaluation of the Nepal emergency cash transfer programme through social assistance.

https://www.unicef.org/evaldatabase/files/UNICEF_ECTP_Final_Evaluation_Report_OPM_April_2017.pdf

⁵⁰ WFP. 2017. Fiji Government and WFP Joint Emergency Response — Lessons Learned Workshop Report, April 2017

https://reliefweb.int/sites/reliefweb.int/files/resources/fiji_lessons_learned_workshop_report_external.pdf

management; and increase or stabilize incomes while improving nutrition behaviour, education and health practices. Together these have shown greater impacts than each programme in isolation.

23. In Bangladesh, significant synergies in reducing stunting were found when the maternal and child health nutrition component of Bangladesh's project "Strengthening Household Ability to Respond to Development Opportunities" was combined with poverty and food-security interventions (e.g. support for home gardens and income-generating activities and participation in public works). Complementary sanitation and women's empowerment interventions obtained similar results.

Boosting innovation, applying new technologies and fostering partnerships to stimulate change

24. E-agriculture is the use of new information and communication technologies applications in the farm sector and is seen globally as an emerging field focusing on the enhancement of agricultural and rural development through improved information and communication processes. These applications are playing a significant role across the food chain, from the use of satellite and geographic information system data for crop forecasting (including failures and possible emergencies) to automation for food processing and packaging and the use of rapid field test kits for food safety. The use of traceability technologies, vital for food safety standards and trade, is growing at a fast pace, and online food retail and e-commerce in agricultural products are major disruptors.⁵¹ The establishment of agro-meteorology systems that can scan for emerging threats and predict the occurrence of known ones at a different time and place will be of immense value for countries to upgrade their regulatory and response frameworks. It will also provide evidence for new and revised international standards for food safety and quality, plant health and animal health. At the same time, Asia has some of the lowest costs for mobile internet services, including data. Therefore, FAO is using these ongoing transboundary challenges to bring stakeholders in Cambodia and Nepal into this process to understand the importance of forecasting and how it can be used to disseminate information inexpensively to reduce human, animal, plant and food safety risks. A separate paper in the 35th Session of the Regional Conference for Asia and the Pacific provides a detailed perspective on e-agriculture and other technologies.

25. Drawing on the need for farming to become climate-smart, Papua New Guinea has broken new ground through its national e-agriculture strategy.⁵² It includes the development of tools for e-learning and content creation and the establishment of databases on agriculture statistics, the census and activities across the supply and value chains. These are to be used for evidence-driven implementation of good practices, crop production technology packages, information systems for agribusiness development, climate-smart agriculture (including services for early warning), surveillance and preparedness, as well as verification of food safety and traceability. The country has already pioneered the use of drones for crop monitoring and optimal use of inputs.

26. Food-systems approaches require partnerships that can draw together a range of different actors to target improved outcomes. The Sustainable Rice Landscapes Initiative (SRLI), launched in March 2019, is one example of a partnership that brings together actors to leverage their comparative advantages and stakeholder networks to drive more sustainable food system outcomes, in this case, in the rice sector. SRLI is a partnership among FAO, the United Nations Environment Programme, the World Business Council for Sustainable Development, Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH, the International Rice Research Institute and the Sustainable Rice Platform to support countries to meet a growing demand for key crops such as rice in a more sustainable manner. In close collaboration with member country governments and with the support of the Global Environment Facility, SRLI projects (or projects with an SRLI-related component) are now under development in seven countries across the region, potentially mobilizing around USD 60 million of Global Environment Facility resources and as much as USD 750 million of public and private-sector co-financing.

⁵¹ Ingram, S. I. 2011. A food-systems approach to researching food security and its interactions with global environmental change. *Food Security*, 3(4). DOI: 10.1007/s12571-011-0149-9.

⁵² Government of Papua New Guinea. 2018. E-Agriculture Strategy (2017–2023) [<https://www.agriculture.gov.pg/publications/e-agriculture-strategy/>]

27. SRLI primarily aims to promote sustainable and inclusive rice production landscapes that link farmers to markets and employ best practices and new technologies to generate a range of global environmental benefits, including increased agrobiodiversity, ecosystem resilience, enhanced efficiency of water and fertilizer use, reduced chemical usage and lower greenhouse gas emissions. For farmers, SRLI is working to improve quality and diversify cropping systems through access to extension services, technology deployment and strengthening local networks of value chain actors to reduce inputs costs and connect to market. Through the World Business Council for Sustainable Development and the Sustainable Rice Platform, SRLI is also working with major private-sector food companies to promote sustainable rice through wide adoption of sustainable rice standards in procurement. In this way, SRLI seeks to bring together public- and private-sector actors to develop consumer recognition of and markets for sustainable agricultural products.

Addressing links between climate change and emergency situations

28. Population growth is causing an overdraft on humankind's use of natural resources while monocultures in crop, livestock and fisheries and urbanization are leading to a loss of arable land and reduction of biodiversity. Climate change is changing the way crops are grown as well as how livestock and fish are raised, captured or cultured. Changes in crop rotations also are altering the pattern of pest and disease infestations and outbreaks, which in turn is modifying schedules of agronomic inputs including fertilizers, manures, pesticides and veterinary drugs for livestock and fisheries. Added to this are the possibilities that animal health and veterinary issues could also be affected; pathogens that formerly did not affect food safety or were non-zoonotic could become more dangerous, as was seen in the cases of avian and swine flu. One Health is therefore now a part of policy platforms and projects in many countries in Asia and the Pacific region. The approach is being implemented to prevent the occurrence of antimicrobial resistance in Papua New Guinea through collection of data and evidence of antimicrobial use across the livestock chain and links with human health. In Myanmar, Nepal, the Philippines and Sri Lanka, One Health measures have been incorporated⁵³ into a risk-based national import control framework.

29. The Asia region is currently grappling with two major transboundary issues: fall armyworm in maize, which has reached there from South America and Africa in 18 months, and African swine fever (ASF).^{54,55} Enormous distances have been traversed by these transboundary pests and diseases in very little time. However, One Health is not yet an integral part of the food system framework as sectoral approaches to emergencies against biotic agents (e.g. animal swine fever virus, the fall armyworm, *Fusarium* TR4 in banana⁵⁶) and abiotic stresses (e.g. water scarcity, drought, flooding) are usually implemented by countries. There is scope for a wider raft of measures to temper the impact of these emergencies and disasters and make agriculture and food systems more resilient: increasing biodiversity to reduce the dominance of a single variety or breed; promoting conservation of landscapes through a sustainable cropping pattern; setting agriculture and land use (including tenure) policies in tune with availability and renewal of natural resources; and incentivizing a circular economy so that the waste of one sector is fuel or fodder for another. The Global Environment Facility has recognized this reality and formulated impact programmes on food systems. Programming proposals prepared by FAO, worth USD 41 million in 2019 alone, have been approved by the Fund's Secretariat.

⁵³ FAO. 2018. Ensuring the safety of imported food. [<http://www.fao.org/3/ca0286en/CA0286EN.pdf>]

⁵⁴ www.fao.org/fallarmyworm

⁵⁵ <http://www.fao.org/ag/againfo/programmes/en/empres/ASF/index.html>

⁵⁶ The full name of the fungal pathogen is *Fusarium oxysporum* pv. *cubense* (Foc) Tropical Race 4.