

### 3. Synopsis of assessments



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# 3 Synopsis of assessments

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## 3.1 Abstract

This synopsis of assessments draws from the five geographical assessments (Indonesia, seven Pacific island countries, Papua New Guinea, the Philippines and Timor-Leste) to identify common vulnerabilities, impacts and opportunities for action with applicability to the greater Indo-Pacific region. A suite of 10 pre-existing vulnerabilities were identified as undermining food security across these geographies, most having strong applicability for the Indo-Pacific region. These broad-ranging vulnerabilities include:

- dependence on food imports
- exposure to climate change and extreme weather events
- patchy biosecurity, animal and plant health services
- fragmented value chains and food system governance.

Loss of employment and income was the most significant impact of the COVID-19 pandemic. Several factors influencing recovery potential and resilience emerged, notably the availability of imported staple foods, local value chains contributing to food and nutrition security, and

evidence of local food system agility. Although the functionality of food system governance was found to be variable, the collective assessments revealed heightened recognition of the importance of food systems to national health and economies, and significant scope for social protection to build resilience.

Research and development opportunities to strengthen food system resilience in the Indo-Pacific region were identified according to the following timescales:

- short term (up to 1 year)—embed food production into social protection initiatives; monitor local prices for early warning for food access and availability; communicate COVID-19 risk more effectively by building on local knowledge and priorities
- intermediate term (up to 5 years)—future-proof value chains by facilitating local supply of nutritious food; support household livelihood portfolios instead of farm income alone; expand and invest in shock-resilient production systems; create strategic partnerships and innovative funding collaborations

- longer term (up to 10 years)—use agriculture and fisheries to deliver sustainable social protection outcomes; enhance agency of local and regional actors in decision-making forums related to food security; explore new partnerships to build coherence between food, nutrition and national security outcomes; invest in future farmers.

### 3.2 COVID-19 in the Indo-Pacific region

The COVID-19 pandemic, a 1 in 100-year crisis, has negatively affected the lives and livelihoods of millions of people across the Indo-Pacific region. This chapter asks how can investment in agriculture and food systems assist countries and communities in the Indo-Pacific region to ‘build back better’ (UN News 2020) in support of their economic and national security? In exploring this question at the scale of the Indo-Pacific region, the primary source of data and other information is the five assessments of Indonesia (Chapter 4), Pacific island countries (Chapter 5), Papua New Guinea (Chapter 6), the Philippines (Chapter 7) and Timor-Leste (Chapter 8), each of which applied the same analytical framework (Chapter 2) in the context of the first six months of the pandemic (January–July 2020).

This synopsis aims to:

- identify key themes where the COVID-19 pandemic has had effects or potential effects on food and nutrition security, smallholder livelihoods and other component social groups within food system value chains
- propose possible research-for-development opportunities that have the potential to protect food and nutrition security while simultaneously contributing positively to economic recovery during this pandemic and building resilience to future shocks.

The five geographical assessments highlight the diversity of populations, economies, agricultural trends, food and nutrition (in) security, and the direct and indirect impacts of COVID-19. In the context of agriculture, there are vast differences across the Indo-Pacific region, from areas where up to 90% of the population is engaged in some form of food production to areas where the agricultural labour force has declined due to mechanisation and reduction in the contribution of agriculture to the overall national economy.

The implications of COVID-19 for the agriculture sector and the food system across the Indo-Pacific are diverse. COVID-19 has directly and indirectly destroyed employment opportunities for large swathes of migrant workers across Asia (ADB 2020) and contributed to increased pressures on rural and urban household incomes and, by association, food security and physical security across the region, including crime and domestic violence.

Investment and improvements in international agricultural productivity had declined significantly prior to COVID-19 (UN 2015, Rampa et al 2019). In addition, growing recognition of the erosion of the world’s natural capital and increasing inequity resulted in United Nations (UN) member states committing to the 2030 Agenda for Sustainable Development (UN 2015), with global agreement on the 17 Sustainable Development Goals. Accordingly, how progress towards the Sustainable Development Goals has been affected by the COVID-19 pandemic, and what this implies for policy, practice and research, is discussed. Importantly, positive examples of and opportunities for enhancing food system resilience in the Indo-Pacific region are highlighted.

### 3.3 Synopsis approach

The Indo-Pacific refers to a geographical region ‘ranging from the eastern Indian Ocean to the Pacific Ocean connected by South-East Asia, including India, North Asia and the United States’ (DFAT 2017).

The data and other information presented in this synopsis are drawn from:

- the five assessments:
  - Indonesia
  - Pacific island countries, comprising smaller (Kiribati, Tuvalu), medium (Samoa, Tonga) and larger (Solomon Islands, Vanuatu, Fiji) island groupings
  - Papua New Guinea
  - the Philippines
  - Timor-Leste.
- the Australian Centre for International Agricultural Research (ACIAR) report *Food systems security, resilience and emerging risks in the Indo-Pacific in the context of COVID-19: a rapid assessment* (Sanderson et al 2020)
- regional and relevant global documentation relating to food systems with an emphasis on intersectoral and interdisciplinary actions required to enhance system resilience
- key informant interviews with senior representatives (8 women, 17 men) from relevant institutions in the Indo-Pacific region—Australian Council for International Development (ACFID), Asian Development Bank (ADB), Food and Agriculture Organization (FAO), International Fund for Agricultural Development (IFAD), International Food Policy Research Institute (IFPRI), International Union for Conservation of Nature, UN Office on Drugs and Crimes, UN Development Programme, World Health Organization (WHO) and four universities.

Desktop research was significantly supplemented with policy and research and development documents supplied through the key informant interview process. Where possible, the researchers sought to contextualise the findings from the specific geography assessments against an Indo-Pacific regional backdrop. These findings were examined using the analytical framework for food system shocks.

The common risks, impacts and opportunities for action identified in this chapter were compiled in consultation with the lead authors of the five assessments.

### 3.4 Exposure and vulnerabilities

It is impossible to predict the duration of the COVID-19 pandemic and its associated long-term impacts on livelihoods and food security. Despite reported progress on reducing hunger and malnutrition in the first decade of the 21st century, the absolute numbers of people experiencing hunger and malnutrition (for example, micronutrient deficiencies, stunting in children, overweight and obesity) have increased over the past four years (FAO 2020a). This increase is unequal across and within countries. A 2018 FAO-led report into food security and nutrition estimated that 486 million people were undernourished across the Asia-Pacific region. Paradoxically, the region was also home to the fastest growing prevalence of childhood obesity (FAO 2018a). This trend is being exacerbated by acute shocks such as the COVID-19 pandemic (World Vision International 2020) and natural disasters (Simpson et al 2008), which come on top of ongoing stresses related to extreme weather events (for example, droughts, floods and cyclones) (IPCC 2020), agricultural pests and diseases (for example, locusts, fall armyworm and African swine fever) (Alders 2020) and

chronic socioeconomic and health inequities experienced by much of the Indo-Pacific region’s population (Grundy et al 2014).

### 3.4.1 Common vulnerabilities

Ten key pre-existing vulnerabilities were common to all five geographies studied. An additional one was related to risk communication, and had less relevance in Indonesia. A brief exploration of these pre-existing elements, which are experienced by a range of countries across the Indo-Pacific region, follows.



#### Common food system risks

- Significant dependence on food imports
- Climate change and extreme weather events
- Pre-existing and persistent nutritional challenges
- Growing informal labour and economic marginalisation
- Pre-existing and persistent gender inequity
- Baseline data gaps: agriculture, fisheries, ecosystem integrity, gender, health, nutrition
- Patchy biosecurity, animal and plant health services
- Fragmented value chains and food system governance
- Rapid population growth, inequity between generations and urbanisation
- Poorly adapted risk communication\*

\* Except Indonesia

### 3.4.2 Significant dependence on food imports

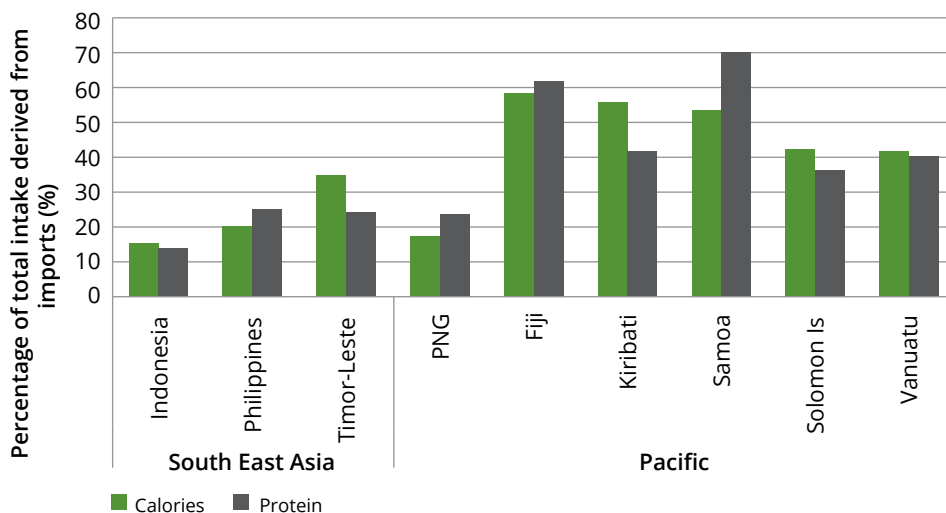
Indonesia, Pacific island countries, Papua New Guinea, the Philippines and Timor-Leste are all significant importers of food. They are dependent on imports for at least part of their food consumption (Figure 3.1). This makes them particularly vulnerable to surges in international food prices or supply chain failures.

In caloric terms, import dependence ranged from 15% (Indonesia) to 58% (Fiji). They were especially high for all the Pacific island countries. By comparison, the shares for India, China and Bangladesh were 5%, 8% and 12%, respectively. In most of the nine countries shown, the degree of import dependence was similar for calories and protein. Import dependence was higher for protein than calories in the Philippines, Papua New Guinea, Fiji and Samoa and the reverse was true for the other five countries.

International staple food prices have been relatively stable. Average rice prices weakened fractionally in June 2020, yet remain elevated compared to one year ago (AMIS 2020).

### 3.4.3 Climate change and extreme weather events

As reported in the five assessments, food systems are both contributing to climate change and impacted by it. Globally, food systems contribute 21–37% of total net human-caused emissions of greenhouse gases (IPCC 2020). Through land-use change, intensive agriculture, large-scale livestock production and other practices, food systems have led to agroecological degradation, destroyed habitats and contributed to climate change. Climate change and associated extreme weather events have been negatively impacting food and nutrition security in the Indo-Pacific region for over a decade (Chatterjee & Khadka 2011, MacPherson 2017).



**Figure 3.1** Percentage of total caloric and protein intake derived from imports (2017)

Source: Except for Papua New Guinea, calculated from FAO food balance sheets. The assistance of David Dawe, FAO RAP office, Bangkok, is gratefully acknowledged. Papua New Guinea estimates are from Bourke et al (2009).

In addition to the obvious impacts of extreme weather events on food production and trading, climate change is also driving geographical spread of disease and pests and increased food safety risks (Maggiore et al 2020). Dujardin et al (2018) reported that significant exposure to changing climate is being exacerbated by high levels of sensitivity of social and ecological systems coupled with limited capacity of low- and middle-income countries to respond to the effects.

### 3.4.4 Pre-existing and persistent nutritional challenges

The growing numbers of malnourished (underweight, overweight, obese and/or micronutrient deficient) individuals was emphasised in each of the detailed assessments. An FAO report (FAO 2018a) clearly demonstrated that food systems in the Asia-Pacific region were not efficiently supporting food and nutrition security prior to COVID-19. When people are close to the

margin of subsistence, this makes them especially vulnerable to shocks that threaten to reduce their food intake. Almost half a billion people in the region are suffering from the triple burden of micronutrient deficiency, undernutrition and obesity and other non-communicable and diet-related diseases such as diabetes (FAO 2020a).

These impacts are unevenly felt, with vulnerable households (including the elderly, people living with a disability, the socioeconomically poor and other marginalised groups), with children and women being overrepresented (FAO 2020a). In Indonesia, for example, stunting in children under five is estimated at 31% (TNP2K 2018) and is largely the result of limited protein and micronutrient intake. In the Pacific region, trade liberalisation in the mid-1990s resulted in an increase of cheap imported processed foods such as noodles, rice and wheat (Plahe et al 2013, Charlton et al 2016). This has contributed to a non-communicable disease crisis in the region. The prevalence of diabetes

and kidney disease in the seven Pacific island countries assessed is much higher than the global average. In Timor-Leste, the inability of many rural families to generate agricultural income significantly impacts nutrition, with infant stunting rates among the highest in the world (GDS 2015, Provo et al 2017). While these nutrition-related indicators are also prevalent in Papua New Guinea, the rates of population-level communicable diseases such as tuberculosis and human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) are also high (DFAT 2018). This is compounded by malnutrition and places additional pressures on health systems that are already overwhelmed and under-resourced (Mola 2020).

#### **3.4.5 Growing informal labour and economic marginalisation**

The detailed assessments indicate that the high proportion of low-paid, informal labour in agriculture and other services that use migrant labour remains a significant vulnerability in the Indo-Pacific region. Poorly remunerated agricultural workers contribute to decreased food availability, access, utilisation and stability over time (FAO 2012). The International Labour Organization stressed that ‘despite sustained job growth, decent work deficits and informality challenge prospects of further reduction in working poverty in Asia and the Pacific’ (ILO 2018).

#### **3.4.6 Pre-existing and persistent gender inequity**

Gender inequity and its consequences were stressed as significant vulnerabilities in each of five geographies studied. In 2018, it was reported that while Asia and the Pacific had made progress in some areas of gender equality, available data against the Sustainable Development Goal indicators highlighted significant inequality for women

and girls (ADB & UN Women 2018). Gender-based violence is endemic in the Asia-Pacific region (UNFPA 2020). There is a lack of adequate data to inform policy and program interventions, and insufficient monitoring to address impunity and provide protection. During conflicts and natural disasters, social structures are further destabilised, leaving many women and girls vulnerable to increased sexual violence, exploitative labour and trafficking.

Women make important contributions to agriculture and rural livelihoods and play a vital role in the care and reproduction of households and communities (Akter et al 2017, Doss et al 2017). However, persistent gender inequalities in the region, such as unequal access to productive resources (including land, services and inputs, finance, training and information), markets and institutions, hamper the realisation of women’s human and productive potential (FAO RAP 2020).

#### **3.4.7 Baseline data gaps: agriculture, fisheries, ecosystem integrity, gender, health, nutrition**

The impact of missing data was highlighted in the Papua New Guinea assessment in particular. However, recent high-quality data on many aspects of smallholder agriculture, food consumption and marketing are scarce across the Indo-Pacific region. While some improvements have occurred at national and subnational levels, significant gaps in location-specific data (i.e. nationwide district-level data) is a major, widespread constraint to effective decision-making (by politicians, bureaucrats, farmers, traders, donors, etc) and implementation across the region. Data comparability across the region is also problematic (ADB & UN Women 2018).

### 3.4.8 Patchy biosecurity, animal and plant health services

The detailed assessments document the ongoing impact of biosecurity and health services weaknesses. For example:

- African swine fever in the Philippines, Papua New Guinea and Timor-Leste
- the rhinoceros beetle threatening the coconut industry in Pacific island countries
- the brown planthopper in Indonesia.

Across the region, biosecurity threats remain a persistent challenge impacting human (MacIntyre 2019, CHS 2019), animal and plant health. Biosecurity regulations in many countries have been drafted within disciplinary silos with limited to no collaboration across public health, animal health and plant health and, indeed, with the security agencies managing borders and ports. Most countries have developed preparedness and response plans for health security threats, but few of these plans constitute an effective multi-hazard plan (CHS 2019). Biosecurity activities are inadequately resourced, meaning all agencies engaged in these issues are underfunded and undertrained (CHS 2019, Castricones & Vijayan 2020). This results in substantial food security and nutrition impacts, and lower farmer incomes, export earnings and balance of payments (Waage & Mumford 2008).

In the Indo-Pacific region, a range of factors contribute to the spread of infectious diseases:

- increasingly dense urban populations (Hassell et al 2017)
- increasing ecological disturbances associated with land-use changes (McFarlane et al 2013)
- the persistence of unsanitary wet markets (Peiris & Yen 2014)

- the highly dynamic flow of people across the region through land, sea and air migrations (Tatem et al 2006)
- health system vulnerabilities, including accessibility and utilisation of screening (CHS 2019)
- diagnosis and treatment of infectious disease (De Guzman & Malik 2020).

Vaccination rates for many preventable human and animal diseases remain inadequate in the region (CHS 2019). Inadequate access to water and sanitation services and poor hygiene practices due to sustained underinvestment in these services heightens health vulnerability (CHS 2019, Lal et al 2019).

### 3.4.9 Fragmented value chains and food system governance

Food system value chains are fragmented, highly diverse and complicated across the region. There are local, short value chains among small landholders and communities that rely on the trading of fresh fruits, vegetables, meat and fish to much more complicated value chains, such as those between the highlands of Papua New Guinea and the urban markets involving large numbers of actors. In Papua New Guinea, there are significant data gaps across production, market chains and demand for the most-traded fresh foods. In the Philippines, conservative low-input farming practices continue to support short and low value chains that are prone to both production and consumption shocks, such as those resulting from African swine fever. The lack of private sector engagement in the food production systems of Timor-Leste limits the development of both markets and value chains.

The detailed assessments highlight the diversity of populations, economies, agricultural trends, food (in)security and problematic health and nutrition security,



especially in rural areas. In many countries in the region, the governance of food security and food systems is fragmented across multiple sectors from agriculture and trade through to public health, and from the public to the private and non-government organisation sectors, with each sector working to different performance indicators and priorities. There is no coherent governing body for food systems in the region, making policies that work across sectors hard to facilitate.

### **3.4.10 Rapid population growth, inequity between generations and urbanisation**

The youth bulge, accompanied by intergenerational inequity that works against the young, and growing urbanisation are impacting agricultural and fisheries workforces in each of the geographies studied. The urban–rural divide has been exacerbated in much of the Indo-Pacific region as a result of most countries focusing their planning on urban areas without adequately supporting resilient systems that enhance development in urban, peri-urban and rural areas. This has been shown by Lipton (1977) and subsequent literature (Perkins et al 2012). Some Pacific nations are an exception, where development and investment activities have tended to prioritise rural areas. Under-resourcing of rural development has left these populations more vulnerable to negative economic shocks than they would otherwise have been.

### **3.4.11 Poorly adapted risk communication**

Gaps in risk communication tools and practices across the region weaken the capacity of countries to effectively engage with at-risk populations and the wider public in the event of health security threats, particularly in the Pacific (CHS 2019). Limited formal education in relation to the origin and control of infectious disease complicates effective risk communication (Alders & Bagnol 2007). For example, the lack of an equivalent term to or different perceptions of the term ‘virus’ are contributing to communication difficulties in both Papua New Guinea (Kyeema 2020) and Timor-Leste (Barnes et al, in press) in relation to African swine fever control. A reduction in consumer demand for pork was reported in the Philippines this year, probably due to an erroneous fear that African swine fever is zoonotic.

## 3.5 Impacts

The impacts of the pandemic on lives and livelihoods in the Indo-Pacific region during its first six months have been diverse and far-reaching. COVID-19 has placed all levels of government across all sectors under enormous pressure as they grapple with the multitude of issues affecting health, the economy and cultural and societal norms.

### 3.5.1 Common impacts

Six significant impacts emerged as common to all or most geographies studied, each of which is briefly described in the sections that follow.



#### Common impacts of COVID-19 on food systems

Loss of employment and incomes

Growing food and employment insecurity

Disrupted value chains, agricultural supply chains

Declining food demand and access\*

Reduced timely access to agricultural supplies

Increased gender-based discrimination^

\* Except Indonesia

^ Except the Philippines

### 3.5.2 Loss of employment and incomes

Significant loss of employment and incomes was common to all five geographies assessed. By April 2020, in Indonesia alone, over 6 million people had lost formal employment and approximately one-quarter of Indonesians surveyed were relying on borrowed money to meet basic needs. More broadly, containment responses to COVID-19 in the region have contributed to widespread job losses, collapsing incomes, and falling remittances (FAO 2020a). ADB used the Global Trade Analysis Project global trade model to estimate the economic effects of the economic containment responses to COVID-19 (Table 3.1). Their estimates demonstrate that, the longer it takes to contain the COVID-19 pandemic, the greater the impact on regional and global economies (ADB 2020, Kim et al 2020).

### 3.5.3 Growing food and employment insecurity

To date, the impact of COVID-19 on food security and nutrition has primarily occurred on the demand side, reducing food intake through loss of income caused by unemployment and furloughs (Dawe 2020a, Kim et al 2020, Schmidhuber et al 2020, World Bank 2020). All studied geographies identified increasing insecurity with respect to food and employment. This finding is supported by a rapid assessment across 14,000 households in nine countries (India, Bangladesh, Nepal, Sri Lanka, Philippines, Indonesia, Myanmar, Cambodia and Mongolia) in the Asia-Pacific. This assessment highlighted that, while COVID-19 began as a health crisis, one of its most serious effects is now increased food insecurity and poverty for vulnerable children and their families (World Vision International 2020). As households struggle to cope with loss of income and livelihoods, meeting basic household needs is a growing

**Table 3.1** Projected economic impact of COVID-19

Geography	Gross domestic product (%)		Employment (million)	
	Short containment	Long containment	Short containment	Long containment
South-East Asia	-4.6	-7.2	-11.6	-18.4
Pacific	-4.6	-7.0	-0.1	-0.2
Asia	-6.2	-9.3	-109.1	-166.7
Global	-6.4	-9.7	-158.1	-242.1

Source: ADB (2020)

challenge. The assessment found that over two-thirds of the respondents said their livelihoods were fully or severely affected. Approximately one-quarter did not have any food on hand, with one-third only having one week's supply.

### 3.5.4 Disrupted value chains, agricultural supply chains

Food value chain disruptions were reported in all studied geographies except for Kiribati and Tuvalu. In Timor-Leste, exports of key crops such as coffee, copra, konjac and candlenut have been disrupted. Regional food supply chains have been disrupted through the closure of local markets, combined with the limited capacity of farmers to store harvested crops (Dawe 2020a). Processing factories have shut down in some instances and local labour shortages have been reported due to travel and international border restrictions. Widespread lack of refrigerated storage, combined with port restrictions and congestion, have led to increased wastage through spoilage of perishables.

### 3.5.5 Declining food demand and access

Lost income and unemployment are leading to some fall in food demand across the board. This has put downward pressure on both retail and farm-level prices (FAO 2020a). The inability to move

food across the region or nationally has left many subnational populations either with stockpiled fresh produce that cannot be sold, or limited access to fresh food and imported food (especially in the short term and in urban settings). This has highlighted the challenges to governance of implementing states of emergency enforced by police, military and customs that may not adequately consider the movement of essential items such as food.

### 3.5.6 Reduced timely access to agricultural supplies

Input supplies, including seeds, fertiliser and animal feed, have been variously disrupted in the geographies assessed, including for upcoming growing seasons. This will lead to later output effects. Disruptions to input supplies raise the cost of farm-level production, placing upward pressure on food prices through the entire value chain. Many countries in the region have experienced shortages in feed supply and labour, which are essential to intensive animal production systems (FAO 2020b). In Papua New Guinea, for example, a lack of poultry feed has impacted day-old chick producers. In some areas, farmers are moving from intensive commercial chicken production to extensive village chicken production (FAO-PG 2020).

### 3.5.7 Increased gender-based discrimination

Emerging data shows that violence against girls and women, particularly domestic violence, has intensified (PLAN International & Save the Children 2020). COVID-19 disruptions to women's safety and wellbeing impact on women through the loss of marketing opportunities for fresh food and various imported manufactured goods and local products in Papua New Guinea and other Pacific island countries. The Pacific and Timor-Leste assessments highlight instances where the increase in populations in rural areas means women have more household pressures to feed their families. Longer-term impacts due to increasing homelessness and decreased investment in education will continue to disproportionately affect women and girls.

## 3.6 Recovery and resilience

Although the COVID-19 pandemic is ongoing, the five detailed assessments, together with reports from the Indo-Pacific region, suggest that the potential for food systems to recover varies within and between countries. While the ability of food systems to anticipate, absorb and recover from the COVID-19 shock suggests that regional food systems are far from resilient, there are also indications of regional economic communities collectively envisioning and moving towards a transformation of their food systems.

### 3.6.1 Common factors influencing recovery and resilience

This research identified six factors of significance to recovery and resilience in all or most geographies studied, which are elaborated in the sections that follow.



#### Common recovery and resilience factors

- Availability of imported staple foods
- Variable functionality of food system governance
- Heightened recognition of the importance of food systems
- Significant scope for social protection to build resilience
- Local value chains contributing to food and nutrition security<sup>^</sup>
- Evidence of local food system agility<sup>†</sup>

<sup>^</sup> Except the Philippines

<sup>†</sup> Except Timor-Leste

### 3.6.2 Availability of imported staple foods

The constant availability (as at the end of July 2020) of key staple foods, such as rice, was a uniform finding across all studied geographies. In Timor-Leste, for example, the government worked effectively with major food importers to ensure continuity of supplies. It would appear that measures put in place to reduce surges in international prices and possible interruptions to international supply following the global food crisis in 2007–08 are operating effectively. Market policy reforms instituted

after the global food crisis of 2007–08 have contributed to the ongoing availability of rice at a largely affordable price in countries across the region (FAO 2020a). However, if international food prices rise, exporting countries may attempt to protect their domestic consumers by restricting exports, as occurred in 2007–08 (Dawe 2020b). It is important that this response be avoided.

### 3.6.3 Variable functionality of food system governance

Fragmented food governance, with inadequate involvement of women and youth in policymaking and implementation, is common across the region. After COVID-19, the national and regional COVID-19 pandemic crisis committees established to deal with the impact of the outbreak on food supply (including ministries of agriculture, livestock, fisheries, food, transport, economy, trade, health and social welfare) have an exceptional opportunity to support sustainable, healthy food systems.

There is a plethora of policies at national, regional and global levels that align with food system resilience. The problem is not always a lack of policies, but rather a lack of knowledge of their existence and limited resources for coordination and effective implementation. By employing an intersectoral systems approach, alignment can be sought across key national and international strategies and agreements, enabling more efficient outcomes of investments by the public and private sectors. Some notable examples are:

- Universal Health Coverage Political Declaration (UN 2019), which highlights the importance of food security
- Sendai disaster risk reduction framework (UNDRR 2015), which has helped improve disaster risk preparedness in the Indo-Pacific
- 2018 Boe Declaration, which articulates how Pacific island countries view national security
- Framework for Resilient Development in the Pacific (SPC et al 2016)
- Statement of Association of Southeast Asian Nations (ASEAN) Ministers on Agriculture and Forestry in Response to the Outbreak of COVID-19 to Ensure Food Security, Food Safety and Nutrition in ASEAN (ASEAN 2020)
- Convention on Biodiversity (UN 1992)
- 2030 Agenda for Sustainable Development (UN 2015), which has set 17 globally agreed Sustainable Development Goals.

Approaches that focus on only one crisis at a time may inadvertently worsen other crises. Pragmatic and equitable approaches to global health security, food security and food production, and justice in human, animal, and environmental health are being brought together under the One Health paradigm (Alders et al 2017, in press; Cleaveland et al 2017; Lysaght et al 2017; FAO 2020c; Garcia et al 2020). Active engagement by national governments and regional economic communities in these global debates are essential to ensure that the post-2030 development agenda align with their core values and aspirations.

### 3.6.4 Heightened recognition of the importance of food systems

The COVID-19 pandemic has heightened recognition among state and non-state actors across the Indo-Pacific region that agriculture, fisheries and food production are essential to life and livelihoods and cannot be taken for granted. This was particularly evident in the assessments for Indonesia and the Pacific island nations. Governments are encouraging household food production, and increasing numbers of urban migrants are returning to rural areas and contributing to agricultural endeavours.

In order to meet Sustainable Development Goal 2 'Zero Hunger' commitments, national government investments in the agriculture sector will need to increase significantly in most countries. In the medium to long term, governments must encourage diverse food and nutrition security activities in urban, peri-urban and rural settings (CHF 2020).

### **3.6.5 Significant scope for social protection to build resilience**

Social protection measures have been introduced in response to COVID-19 for all studied geographies. In Timor-Leste, the national budget allocated to social protection measures is equivalent to the combined funding for health and agriculture. However, the distribution process lacks gender sensitivity and potentially acts as a disincentive to engagement in agriculture. Regionally, income losses from COVID-19 have occurred among urban, rural non-farming and smallholder farming households that depend in part on incomes from off-farm sources, including remittances. In addition to cash transfers, civil society organisations have facilitated asset distribution programs. These programs include seeds for leafy green vegetables that can be grown in kitchen gardens and small livestock distribution programs (World Vision Australia 2020). Ensuring gender-sensitive animal and plant health extension services will be crucial to increasing the success of these programs. Social protection activities that contribute to smallholder livelihood agricultural and fisheries strategies will build resilience and reduce the need for emergency relief during subsequent crises.

### **3.6.6 Local value chains contributing to food and nutrition security**

International trade plays an important role in ensuring food supplies to food deficit countries. These supply lines will

remain important in the face of climate change adaptation (Janssens et al 2020). However, global food supply chains have largely focused on trade in staple foods and ultra-processed food, due to their longer shelf life and relative ease of storage. Food with higher nutrient quality tends to be perishable, and requires either short value chains or robust storage conditions. Assessments for Indonesia, Pacific island countries and the Philippines suggest that more localised food value chains may promote better food and nutrition security outcomes. Shorter value chains also increase agency and equity in food systems (Davila 2019) and enhance women's participation, as they are better able to engage in income-generating activities while also meeting their household care responsibilities (FAO 2018b).

After COVID-19, all countries will probably try to identify an optimal balance between local production that directly contributes to national and household food and nutrition security but also raises foreign exchange via the production and sale of cash crops, such as coffee, cocoa and gallup nut.

### **3.6.7 Evidence of local food system agility**

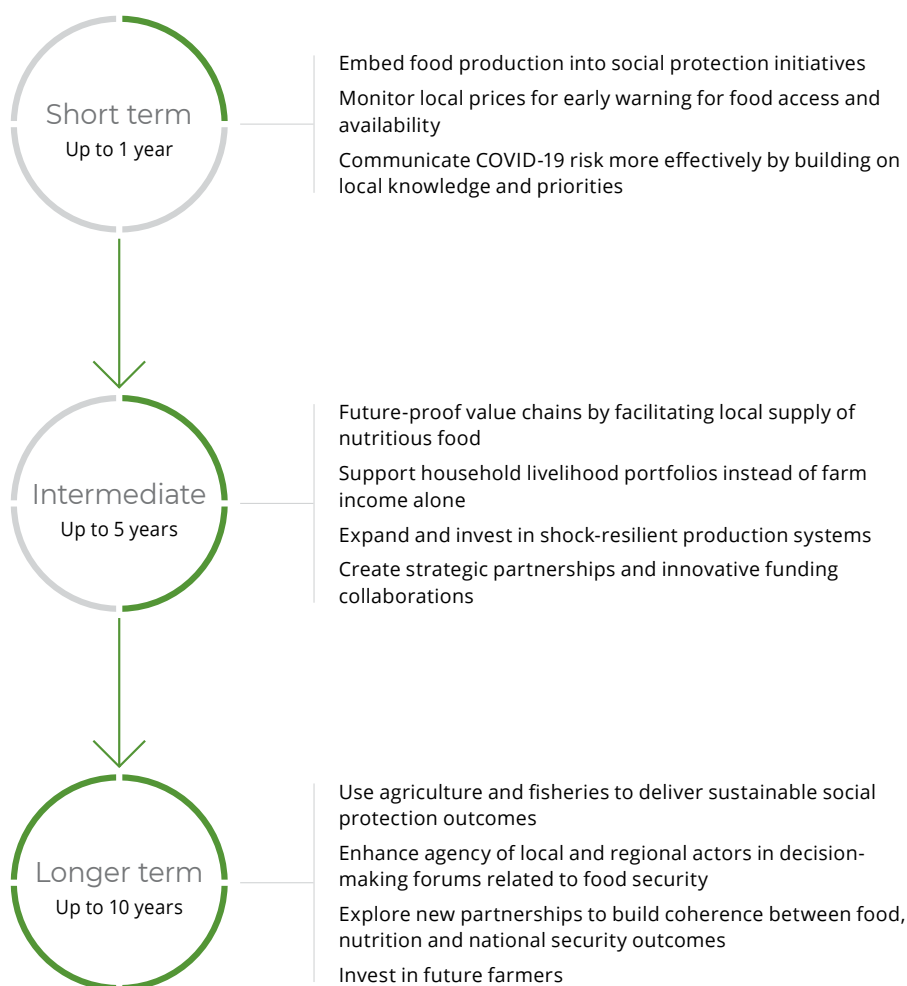
Local food systems in all but one of the geographies studied have highlighted examples of resilience and nimbleness in the face of the pandemic, including increased engagement of women. A good example from the Pacific island countries assessment is that of developing new ways of marketing through self-organising food distribution systems and emergence of e-commerce systems. However, several of the country studies note that the ability of local and national governments to identify blockages to supply chains is impeded by their incapacity to monitor local prices.

## 3.7 Opportunities for regional action

The COVID-19 pandemic has revealed shortcomings and, in some cases, created new fragilities in current food systems across the Indo-Pacific region. These food systems need strengthening in order to better navigate this shock and those that will inevitably occur in the future.

### 3.7.1 Snapshot of regional opportunities

Research and development opportunities with broad applicability to the region have been identified in the geographic assessments according to three investment timescales. These opportunities are outlined in the follow sections.



### 3.7.2 Short term (up to 1 year)

#### *Embed food production into social protection initiatives*

Given the finite resources available to countries, it is crucial to prioritise responses effectively. It is essential that a health crisis is not allowed to transform into an emergency economic and food crisis. The short-term intervention priorities are to:

- transfer money or appropriate assets (including seeds and smallstock for smallholder farmers) into vulnerable peoples' pockets so that they can afford to buy and/or produce the food they need, or acquire it through other means
- make sure that food keeps moving, by ensuring that food supply chains are considered essential services, enabling them to continue to function (Pangestu 2020), and seeking opportunities to purchase smallholder farmers' products for distribution via social protection programs
- identify options for sustaining food security in gender-sensitive (Hidrobo et al 2020) and culturally acceptable ways that support human, animal and environmental health (Alders et al 2018, in press)
- ensure timely access to essential health services.

Applied research that seeks to reduce gender-based discrimination and enhance smallholder household livelihoods as integral components of social protection should be prioritised.

#### *Monitor local prices for early warning for food access and availability*

Local bottlenecks in food supply are reflected in market prices. This varied widely in the five geographies assessed. However, in all of them, the capacity to monitor movements in local food prices is lacking, restricting the capacity of governments to

identify local food shortages and respond accordingly. Resilience to unanticipated shocks relies on the prompt flow of information among agents involved in food chains, including the identification of problem areas, to make rapid responses possible when circumstances change. Governments may be able to promote this process by facilitating communication among local government officials, private sector representatives and non-government organisations that have local expertise. The form this might take would depend on local circumstances, including existing institutions, customs and e-commerce practices.

#### *Communicate COVID-19 risk more effectively by building on local knowledge and priorities*

Risk communication must be an integral component of all activities while COVID-19 risks remain. Special attention is required in settings where communities are not necessarily familiar with the germ theory of disease, but instead associate illness with other causes. This hampers compliance with control recommendations. Participatory action research is recommended. This could include:

- involving smallholders in order to better understand knowledge landscapes when developing risk communication materials
- the use of culturally and gender-sensitive participatory epidemiology (Catley et al 2012)
- participatory biosecurity (Barnes et al 2020)
- participatory impact assessment (Catley et al 2013) in combination with conventional disease control techniques.

This approach is likely to yield more effective and efficient risk management practices by building on the knowledge and priorities of all key stakeholders.



### 3.7.3 Intermediate term (up to 5 years)

#### *Future-proof value chains by facilitating local supply of nutritious food*

Overcoming the fragmentation of value chains and power imbalances with respect to input supply and marketing will require collaborative research and development with civil society on aspects of sustainable smallholder fisheries and agriculture and associated value chains. This includes creative education that improves literacy as well as appropriate agricultural, fishery and marketing knowledge.

Participatory action research presents an opportunity for active engagement of smallholders in data collection and analysis along value chains, while delivering more comprehensive and reliable data for all decision-makers. These range from individual smallholders to ministers of agriculture, fisheries and livestock.

Opportunities to link smallholder farmer associations with endeavours to improve regional food security is a vital research area. E-commerce platforms and expansion of current WhatsApp and Facebook pages to sell products and exchange goods and services are examples of technology that could support such approaches.

#### *Support household livelihood portfolios instead of farm income alone*

A combination of desktop research and targeted surveys could identify preliminary opportunities for increasing the value of off-farm incomes of households in ways that do not increase the burden on women and children. The opportunities might include seasonal or circular forms of labour migration and remittances. Priority areas for such research include the Pacific island countries and Timor-Leste.

#### *Expand and invest in shock-resilient production systems*

Excessive dependence on distant sources for low-cost, energy-rich and nutrient-poor food and distant export markets heighten vulnerabilities associated with COVID-19, climate change and malnutrition. Countries with high child stunting rates (for example, Papua New Guinea and Timor-Leste) and those already significantly impacted by climate change (for example, Pacific island countries) should be prioritised. Knowledge gaps include:

- nutritional profiles (de Bruyn et al 2016) and life-cycle analysis of locally available foods
- health promotion and behavioural change activities to improve utilisation of nutritious food
- cost-efficient, feasible options for storing, replicating and disseminating 'clean' planting materials, breeding stock and input supplies for livestock and fisheries
- identifying and trialling nutritious saline-tolerant, drought-tolerant and waterlogging-tolerant plants (i.e. halophytes) that are safe and nutritious to provide an agricultural opportunity in areas where freshwater is scarce, or where land is being infiltrated with saltwater due to rising sea levels (Bushnell 2020, CHF 2020)
- effective engagement of women and men smallholders in research is essential given the gendered impacts of climatic and non-climatic stressors (Gopalakrishnan et al 2019)
- economic and food and nutrition security benefits and opportunities associated with shorter and longer value chains for individual countries.

### *Create strategic partnerships and innovative funding collaborations*

International agencies are pivoting their development programs to respond to COVID-19-associated impacts on food and nutrition security. Available funding for these activities is well below the required level, so the importance of ensuring optimal outcomes for the funds invested is crucial. Complementary research activities are needed to increase the effectiveness of these programs. For example, in the Pacific, IFAD is supporting the design and implementation of smallholder models in remote atoll islands with limited resources to strengthen local food systems and self-reliance through the Small Islands Food and Water Project. In Asia, the FAO is initiating a range of COVID-19 and food system-related projects.

#### **3.7.4 Longer term (up to 10 years)**

### *Use agriculture and fisheries to deliver sustainable social protection outcomes*

Globally, of the 558 million farms with 20 ha or less land, 410 million (72%) farms are less than 1 ha (Woodhill et al 2020). The majority of the smallholder households farming these very small areas of land will probably be regular recipients of social protection, where such support is available. Redesigning the delivery of social protection provides an opportunity to build food system resilience and raise smallholders out of chronic poverty. There will probably be at least three streams to the research:

1. identification of viable options for smallholders to sell their produce into local and regional social protection food distribution programs
2. social protection mechanisms that provide options for improved farming and fishing production and marketing practices or transition pathways to other livelihood activities

3. tailored approaches to ensure gender sensitivity (Hidrobo et al 2020) and cultural acceptability (Alders et al, in press).

### *Enhance agency of local and regional actors in decision-making forums related to food security*

Transforming food systems to deliver nutritious, safe and affordable food is a global endeavour that will require policy and infrastructure alignment across all major sectors. This process is underway and will be boosted by the UN Food Summit in July 2021 and regional forums such as the proposed 2021 Pacific Week of Agriculture. Partner countries in the Indo-Pacific region must be fully engaged with and empowered to influence this transformation. Realising food systems that are climate-smart, gender- and nutrition-sensitive, economically viable and biodiverse will require long-term strategic alliances between regional economic communities, national governments and farmer and fisher associations. Food systems research and development will be vital in informing these partnerships, spearheading transformative policies and aligning infrastructure.

Food supply chains, including wet markets, require tailored investment in the development of culturally appropriate, safe and practical supply lines. Engaging with male and female farmers, fishers and producers, traders and consumers to build confidence in and reliability of local food value chains will be a key component. This would include a focus on food safety (i.e. prevention of and surveillance for physical and chemical contaminants and pathogens), reducing food loss and waste, and organic nutrient-recycling. Central to this process will be building and amplifying smallholder resilience (HLPE 2020). Collaborative research activities that allow male and female farmers and fishers to share and improve their knowledge and practices relating to climate-smart, sustainable

production and marketing systems will be key to long-term success.

### *Explore new partnerships to build coherence between food, nutrition and national security outcomes*

The centrality of food security to human security is increasingly acknowledged (Hodson 2017, CHF 2020). For example, in the Pacific region, the Boe Declaration (PIFS 2018) articulates how Pacific island countries view national security through its articulation of both traditional and non-traditional security threats. The impact of climate change and the need to secure food and water are key components of the declaration, which is shaping the development of national security strategies. Supporting key agencies at local and national levels to participate in shaping the centrality of food systems in processes of governance around national security would ensure the maintenance of the entire food system is supported by a whole-of-government approach, where all agencies understand their particular role (SPC et al 2016).

### *Invest in future farmers*

School and vocational training curricula must be better adapted to local circumstances. Priority areas include:

- improved understanding of local agroecological zones and opportunities for youth to become successful farmers, fishers and marketers
- enhanced capacity to embrace appropriate technological innovations
- functional knowledge of human health and nutrition
- understanding of how to meet nutrient requirements with locally available, nutritious food
- valuing of indigenous knowledge on how to sustain agroecosystems

- improved understanding of the germ theory of disease and associated hygiene and sanitation practices.

Research and development programs that facilitate the development and implementation of locally tailored curricula and feasible options for their effective delivery are vital for future food security.

## 3.8 Conclusions

The COVID-19 pandemic has brought into stark focus the vulnerabilities associated with food systems in the Indo-Pacific region, such as climate change, water availability, changing nutritional trends and inadequate human health services, rapid population growth and underinvestment in local agricultural production and value chains. With the COVID-19 shock leading to reductions in research and development and public investments, budgets to transform food systems and value chains will be limited. However, key elements of resilient food systems are already in place and provide a foundation on which to build. The focus must be on:

- how to produce more with less inputs
- how to develop more equitable, sustainable and resilient food systems in the face of climate change
- how to guarantee access to nutritious food with increasing demand and increasing scarcity of water and non-renewable energy.

Strategic intersectoral coordination and investments will be crucial in identifying, tailoring and implementing best-practice policies and practices.

By 2019, the likelihood of achieving the Sustainable Development Goal 2 of zero hunger by 2030 was already in doubt, due to persistent malnutrition and low smallholder productivity and income. This situation has been exacerbated by the COVID-19 crisis

(FAO et al 2020). Despite the pandemic and other concurrent threat multipliers, the quest to build resilient, nutritious food systems is not starting from zero. Examples of foundational food system frameworks, policies and practices are already in place at community, country, regional and global levels. To reach zero hunger, responses to the current crisis must contribute to building a transformed food system that is more inclusive, sustainable and resilient. The call by the UN for 'a shift that makes healthy diets affordable to all and contributes to the eradication of hunger, food insecurity and all forms of malnutrition in children and adults' (FAO et al 2020) will require effective interdisciplinary and intersectoral actions. Agriculture and resilient food systems will be critical in underpinning economic and social recovery from the COVID-19-induced food insecurity and economic recession crisis in the Indo-Pacific region.

Historically, agricultural research focused primarily on increasing production and marketing of commodities. However, the challenges discussed above reach well beyond the farm gate. This pandemic poses challenges around how to improve value chains, logistics and storage, how to identify blockages to supply chains arising from shocks like COVID-19, and questions of ecological sustainability, land-use change, nutrition, health, sociocultural diversity, social justice and social protection. An integrated, all-hazards systems approach that works with all partners in harmony with national and global commitments (such as the Sustainable Development Goals, the Universal Health Coverage Declaration and the Sendai Disaster Risk Reduction Framework) is in line with the Australian Government's Partnerships for Recovery response (DFAT 2020) and would enable countries to efficiently deliver on their current commitments. It is a huge endeavour, but one that will lead

to multiple benefits, including improved health outcomes, increased climate resilience and more diverse and resilient national economies.

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