

## 5. COVID-19 and food systems in Pacific island countries



Photo: ACIAR

## 5.2 COVID-19 in Pacific island countries

### 5.2.1 Focal countries overview (July 2020)



#### Land use

Small islands average 1,336 km<sup>2</sup>  
(51% agriculture)  
Medium islands average 3,893 km<sup>2</sup>  
(29% agriculture)  
Large islands average 64,058 km<sup>2</sup>  
(14% agriculture)  
20.6% GDP from agriculture  
and fish (average)



#### Population

Small islands 130,000 people  
Medium islands 299,000 people  
Large islands 1,867,945 people  
62% rural (average)  
Adjusted income per capita  
US\$3,343 (average)



#### COVID-19 and health

First recorded cases:  
18 March (Samoa); 19 March (Fiji)  
At 3 August: 509 known cases;  
8 deaths\*  
Cases in 6 out of 21 countries  
(excluding PNG)



#### Local response to COVID-19

State of emergency: March 2020  
(all 7 countries)  
Rapid closure of national borders  
Quarantine established,  
from 14 to 28 days  
Suspension of schools, mass  
gatherings; changes to working  
arrangements



#### Agriculture and fisheries

Top staples: coconut,  
taro, cassava, bananas,  
sweetpotato, yams  
Low farm productivity; traditional  
farming and fishing practices  
Primary production focuses  
on domestic markets



#### Key risk multipliers

Climate impacts, declining fresh  
water resources  
Agricultural and biosecurity risks  
Persistent malnutrition  
and dietary issues

\* Of the seven focal countries, all but Fiji were COVID-19 free at the conclusion of the assessment. Fiji reported 21 confirmed cases as of 9 July 2020.

### 5.2.2 Development context

Pacific food systems are diverse and complex, spanning various different geographies and agroecological environments (McGregor et al 2009, Taylor et al 2016). For this assessment, seven Pacific island countries have been selected on the basis of a typology of island groupings (Table 5.1):

- smaller (Kiribati, Tuvalu)
- medium (Samoa, Tonga)
- larger (Solomon Islands, Vanuatu, Fiji).

This allows the impacts of COVID-19 to be differentiated geographically and is consistent with other Pacific studies that have examined food systems shocks (Taylor et al 2016) and with regional development in food systems programming (Bell & Taylor 2015, Bell et al 2016, SPC 2016, SPC 2020b).

Pacific island countries comprise more than 2,000 islands and atolls in 22 countries and territories. While the region covers one-third of the Earth's surface, the total land area is only approximately 550,000 km<sup>2</sup>, representing 2% of the entire 30,000,000 km<sup>2</sup> of the Pacific region (Barnett 2011). This land area is home to approximately 2.3 million people (excluding Papua New Guinea), of

which half live within 1 km of coastal areas (Andrew et al 2019), and a rapidly growing number around major cities. Urbanisation in Pacific island countries is happening three times faster than the global average (UN Habitat 2015), and by 2050 over 50% of the Pacific population is expected to live in urban areas (UNESCAP 2018).

Pacific island countries have a rich history of traditional land and marine systems management that continues to influence how communities manage their natural resources (Campbell 2015, Wairiu 2017). Pre-colonial food systems were characterised by diverse activities surrounding food production and exchange, which included a mix of subsistence farming and hunter-gatherer food harvesting systems, bartering and regional trade between islands. Nutrient-rich diets with leafy vegetables and complex carbohydrates were the norm, with plant foods constituting 83% of the diet and poultry, fish, and pigs making up the protein and micronutrient requirements of many Pacific island people (Connell 2015, Charlton et al 2016, Gnechchi-Ruscione & Paini 2017). With the surge of trade liberalisation in the mid-1990s, the region experienced a rapid increase of cheap imported processed foods such as noodles, rice and wheat (Plahe et al 2013,

**Table 5.1** Typology of Pacific food systems

Group	Typical geologies	Nations in this assessment	Population (est. '000)	Total island area ('000 km <sup>2</sup> )
Group 1: smaller islands	small reef and composite islands	Kiribati	120	0.81
		Tuvalu	10	0.03
Group 2: medium islands	volcanic, limestone and composite islands	Samoa	199	2.84
		Tonga	100	0.75
Group 3: larger islands	mix of composite, limestone and sand-based islands	Solomon Islands	667	28.4
		Vanuatu	305	12.2
		Fiji	895	18.3
<b>Total</b>			<b>2,296</b>	<b>63.3</b>

Charlton et al 2016). These imports have slowly shifted eating habits, and have been accompanied by increasingly sedentary lifestyles, both of which contribute to the substantial burden of non-communicable diseases in the region, including stunting, micronutrient deficiencies, obesity and diabetes.

### *Variations between countries*

The contribution of agriculture and fisheries to livelihoods varies between countries (Table 5.2), but primary food production remains core to the region's economies.

Group 3 countries have highly diverse food production and differentiated dependence on rural livelihoods. For example, in Solomon Islands and Vanuatu, rural livelihoods are crucial for development, with 70–80% of the population living in rural areas in both countries and involved to some degree in agriculture and/or fishing. In Fiji, less than half of the population lives in rural areas. The contribution of agriculture to gross domestic product also varies, from approximately 35–40% in Solomon Islands to 15–20% in Vanuatu and less than 10% in Fiji, reflecting the higher reliance on tourism in Fiji and Vanuatu than Solomon Islands. The scale of agriculture is most pronounced in Vanuatu, with over 1.5 Mha under some agricultural use, to 800,000 ha in the Solomon Islands and 400,000 ha in Fiji (FAO 2020b).

The medium-sized Group 2 countries have lower capacity for food production, and much higher trade deficits given their reliance on imported foods (McGregor et al 2009). In Tonga, over 77% of the population lives in rural areas and agriculture takes up 45.8% of land and contributes to 15–20% of gross domestic product. In Samoa, 82% of the population live in rural and peri-urban areas, and agriculture occupies 12.4% of land and contributes to 10–20% of gross domestic product (Sialoa 2019). In Samoa, the rate

of participation in subsistence agriculture is 60%, indicating strong dependence on farming for immediate food security.

The smaller Group 1 atoll countries are more reliant on fisheries than agriculture, given the land resource and freshwater constraints. Approximately 40% of the populations of both Tuvalu and Kiribati live in rural areas. Agricultural land makes up 42% of Kiribati and 60% of Tuvalu, contributing to approximately 24% of gross domestic product in Kiribati and 17% in Tuvalu.

### *Agriculture*

The economic contribution of agriculture is derived from two major sources: commodity and non-commodity exports. Commodity exports are most pronounced for the larger countries. Solomon Islands, for example, has approximately 40,000 households growing coconuts and 20,000 growing cocoa as export cash crops. Cash crops for export are also common in Fiji (notably sugar and coconuts) and in Vanuatu (kava). Non-commodity horticultural exports are also very important for the region, contributing approximately A\$66 million of agricultural export value (McGregor 2007). These horticultural products include a variety of root crops, vegetables and fruits frequently consumed by diaspora communities in Australia, New Zealand and the United States.

### *Fisheries*

Fisheries resources of the Pacific provide a major source of food and income for multiple countries, and offer substantial economic prospects for the region, especially for countries with limited land (Gillett & Tuati 2018). Fisheries in the region fall under two main categories: oceanic, with tuna being the region's primary catch, and coastal, which includes multiple fish species as well as cephalopods, crustaceans, shellfish and eels.

**Table 5.2** Agricultural, fisheries and nutrition context of Pacific island countries

Indicators		Unit
Surface area <sup>a</sup>		'000 km <sup>2</sup>
Agricultural land <sup>b</sup>		percentage of land area
Age of population <sup>a</sup>	0–19 years	percentage of total population
	20–39 years	percentage of total population
	40–59 years	percentage of total population
	over 59 years	percentage of total population
Stunting rate <sup>c</sup>	under 5 years	percentage of age group
Wasting rate <sup>c</sup>	under 5 years	percentage of age group
Overweight <sup>c</sup>	under 5 years	percentage of age group
	male	percentage of total population
	female	percentage of total population
Obesity <sup>c</sup>	male	percentage of total population
	female	percentage of total population
Prevalence of undernourishment <sup>c</sup>		percentage of total population
Population distribution <sup>a</sup>	rural	percentage of total population
	urban	percentage of total population
Gross domestic product per capita <sup>a</sup>		US\$
Adjusted net national income per capita (2018) <sup>a</sup>		US\$
Agriculture and fisheries, value added <sup>f</sup>		percentage of gross domestic product (2018)
Government expenditure on agriculture	FAOSTAT	percentage of total outlays
	National statistics	percentage of total outlays
Top staples		ranked most to least

UNDP Human Index ranking (2019) <sup>d</sup>	out of 189
--	------------

2017 World Risk Index (mean value calculation 2012–2016) <sup>e</sup>	out of 171
---	------------

a World Bank (2020)

b FAO (2020a)

c Global Nutrition Report (2020)

d UNDP (2020)

e Bündnis Entwicklung Hilft (2017)

f Samoa Bureau of Statistics (2016)

g CBSI (2007)

h FAO (2011)

i Government of Tuvalu (2016)

j Government of Samoa (2016)

k Government of Solomon Islands (2015)

l Government of Vanuatu (2015)

Data collated on 10 July 2020 by Alex van der Meer Simo.

Group 1		Group 2		Group 3		
Kiribati	Tuvalu	Samoa	Tonga	Fiji	Solomon Islands	Vanuatu
0.81	0.03	2.84	0.75	18.3	28.4	12.2
42	60	12.4	45.8	23.26	3.9	15.3
45	no data	48	46.1	37.8	50.5	48
32	no data	27	27.4	31.3	28.5	30
18	no data	18	17.8	21.9	15.5	16
6	no data	7	8.4	8.7	5.4	6
no data	10	4.9	8.1	7.5	31.6	28.5
no data	3.3	3.9	5.2	6.3	8.5	4.4
no data	6.3	5.3	17.3	5.1	4.5	4.6
77	80	74	75	60	50	52
81	84	82	82	68	60	62
42	47	40	41	35	18	20
50	56	55	54	25	27	30
3.2	3.3	2.7	no data	3.7	8.9	7.2
46	38	82	77	44	76	75
54	62	18	23	56	24	25
3,894	3,701	4,183	4,364	6,267	2,138	3,214
2,980	no data	3,574	4,040	5,137	1,469	2,859
30.8	16.5	9.8	17.2	9.2 (2012)	35	25.8
no data	no data	7	no data	4.4	no data	3.9
no data	no data	3.3 <sup>f</sup>	no data	no data	>2% <sup>g</sup>	no data
coconut, banana, taro, copra, breadfruit <sup>h</sup>	coconut, pulaka, banana, breadfruit, taro, cassava, sweetpotato, pawpaw, pumpkin <sup>i</sup>	taro, chicken, fish, canned mackerel, rice, banana, brown sugar, coconut, bread, instant noodles <sup>j</sup>	coconut, cassava, sweetpotato, yam, taro, banana <sup>h</sup>	coconut, taro, cassava, sweetpotato, rice, cereals, banana, yam, maize <sup>h</sup>	rice, sweetpotato, cassava, yam, taro, banana, pumpkin, vegetables, coconut, livestock <sup>k</sup>	taro, yam, cassava, sweetpotato <sup>l</sup>
132	not listed	111	105	98	153	141
165	not listed	not listed	2	15	6	1



Coastal fisheries provide the primary or secondary source of income for up to 50% of households, and 50–90% of the animal-sourced protein consumed (SPC 2015). The dependence on fisheries for household food security and incomes, as well as government revenue, is pronounced in Kiribati and Tuvalu, where 8–10% of their gross domestic product is obtained from fisheries. Group 2 and 3 countries have lower proportions of gross domestic product from fisheries: 1% for Vanuatu and 3% for Samoa (Gillett 2016). Aquaculture has been introduced in some countries as a way of reducing pressure on fisheries; however, this has not been upscaled.

### 5.2.3 Status of COVID-19 in Pacific island countries

As of 7 July 2020, six out of 21 Pacific island countries (excluding Papua New Guinea) have reported a total of 449 cases of COVID-19 and seven deaths (WHO 2020). The limited spread of COVID-19 has been largely due to individual governments taking rapid action to shut down borders, limit domestic travel, establish curfews and put in place physical distancing measures. Of the nations assessed, all but Fiji remain COVID-19 free. Fiji reported 21 confirmed cases as of 9 July 2020.

States of emergency were established in all seven countries assessed, and Vanuatu has extended this until 31 December 2020. Pacific island responses to managing the COVID-19 outbreak and subsequent livelihood and economic implications have been varied. During the early stages of the pandemic in the region (March 2020), there was a rapid closure of national borders and various quarantine periods were enforced for people entering the country: from 14 days in Solomon Islands, Samoa and Tonga to up to 28 days in Fiji. Sea freight has continued, albeit with lesser frequency.

The region has limited health services and social protection programs, most notably in Group 1 and 2 countries. A number of government stimulus packages have started to emerge in the region. A comprehensive overview of nation-specific responses to the crisis is provided at the Australian National University's Australia Pacific Security College website ([psc.crawford.anu.edu.au](http://psc.crawford.anu.edu.au)).

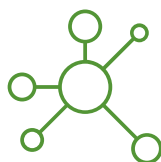
## 5.3 Assessment approach

This assessment is based on interviews with 21 key informants (7 women) who were working in agriculture or fisheries, and/or supporting rural communities and development activities related to food security and agrifood production. A list of potential key informants was generated by collating contacts from a range of sources including the research team, the Australian Council for International Development (ACIAR) Country Manager and author networks in the region. Interview questions were designed to provide key information related to the resilience and food systems analytical framework (Chapter 2).

Interview data was triangulated with rapidly emerging published material. This included regional documents on impacts on agriculture and fisheries (FAO 2020de, PIFON 2020), social vulnerability indicator data (SPC 2020a) emerging empirical research findings (Eriksson et al 2020, Piturara 2020), and peer-reviewed literature (Béné 2020, Farrell et al 2020). Triangulation also took place through active participation during the World Food Programme Regional Pacific Food Security Cluster Meetings held on 13 May and 30 June 2020. Informal discussions also took place to understand the alignment of this work with ongoing assessments by International Fund for Agricultural Development and the Pacific Island Farmer Organisations Network as well as the World Food Programme's Mobile Vulnerability Analysis.

## 5.4 Assessment results

### 5.4.1 Snapshot of key findings



#### Smallholders

Farmers, fishers impacted by movement restriction and input availability  
Tropical Cyclone Harold increased production challenges in affected countries  
Return to rural areas increased food demand and agricultural pressure



#### Supply chains

Disruption to limited distribution services problematic on small and medium islands  
Reduced demand for exports from large islands  
Tourism decline has ongoing impacts for farm incomes  
Local market closures; reduced availability of fresh produce



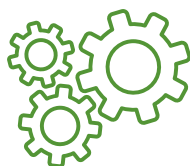
#### Governance

Domestic travel restrictions eased in July  
Some governments enacted price stabilisation for staples  
Limited formal social protection; support activities include distribution of planting material, support for fishing



#### Community

Increased tension over 'idle' and disputed land  
Changes in food consumption; cheaper, less nutritious foods  
Impacts on women include exclusion from workforce, particularly food markets



#### Employment

Reduced income from tourism a major concern  
Reduction in remittances across the Pacific  
Poverty likely to increase as economies contract  
Pandemic worsens existing challenge of high youth unemployment



### 5.4.2 Exposure and vulnerabilities

This section is organised around two major categories of food systems' exposure and vulnerabilities: biophysical and socioeconomic. The main exposures discussed are:

- climate and water risk, and associated loss of arable land
- pests, diseases and biosecurity
- farming practices, coastal fisheries and specific atoll exposures
- globalisation of food systems
- health and nutritional constraints
- services and remittances
- vulnerable populations.

The section draws from analysis of food systems vulnerability already conducted for the Pacific region and integration of findings from key informant interviews.

#### *Biophysical*

##### *Climate and water risk and associated loss of arable land*

Agricultural production has been and will continue to be pressured by freshwater availability and extreme climate events. Key informants from all three island groups identified the loss of arable land and reduction of continuity of food production from extreme events and sea level rise exposures as factors that will multiply the impacts of the COVID-19 pandemic on food systems. Tonga and Vanuatu have already experienced the multiplier effect through the combined impacts of Tropical Cyclone Harold and the COVID-19 crisis. Group 1 and 2 food production systems are exposed to anthropogenic sea level rise, which since 1994 has been 3–10 mm per year and resulted in coastal erosion and loss of land. The combination of loss of land and extreme weather events will continue to create risks for food systems. In prioritising actions, key informants from Samoa and Tonga noted this by stating that

'natural disasters must be on the list of our top risks', and that 'the major ongoing threat to our root crops is climate change'. There is evidence of the cost of cyclones to food production. In the immediate aftermath of Tropical Cyclone Winston in Fiji in 2015, agriculture was the worst hit part of the economy, with losses of A\$368 million (Sleet 2019). In Vanuatu, Tropical Cyclone Pam in 2015 destroyed up to 80% of crops (Cvitanovic et al 2016).

Water-related exposures and risks also amplify food systems insecurity. The combination of sea level rise with limited fresh surface water and groundwater creates another exposure through saltwater intrusion (Leal Filho et al 2020). This depresses agricultural production and represents a geopolitical security risk in the region. Fast-growing populations place pressure on very limited freshwater resources, and the inability to manage this in the context of high dependence on agriculture for livelihoods (notably in Solomon Islands) creates risks for political stability and food security.

##### *Pests, diseases and biosecurity*

Pathogens and pests continue to threaten agricultural and aquatic production in the Pacific. Island environments have inherently limited biological resilience in the face of aggressive invasive species, due to limited natural predators and relatively low genetic diversity. The risk of pests and diseases increases as genetic diversity declines. Multiple biosecurity risks have resulted in substantial food insecurity as well as negative impacts on nutrition, farmer incomes, export earnings and balance of payments (McGregor et al 2011). Biosecurity remains a major risk to traditional food consumption, with pathogens like taro leaf blight responsible for a 55% reduction in Samoan gross domestic product in 1994 and estimated annual losses of A\$11 million between 1994 and 1999 (Singh et al 2012,

Alexandra et al 2020). The current emergence of the coconut rhinoceros beetle, coupled with an emerging disease—Bogia coconut syndrome (a Solomon Island local variant of coconut lethal yellowing), predisposes these agricultural systems to shocks like the COVID-19 pandemic. The risk of African swine fever and fall armyworm (both of which are now in Papua New Guinea) spreading east also threatens food systems.

*Farming practices, coastal fisheries and specific atoll exposures*

Farming in the Pacific uses very limited land, coastal fisheries are under substantial pressure and agroecological diversity has declined. The Pacific region has the smallest landholdings in the world, with an average holding of 1 ha, and an average of 3.2 parcels per holding (FAO 2000). For most of the Pacific, the total land cultivated by smallholders comprises a sizeable portion of total agricultural land (Taylor et al 2016). Agricultural production in large parts of the Pacific is well below its inherent potential (FAO 2010), with recent analysis by Farrell et al (2020) finding that between 1980 and 2016, crop production in the region (excluding Fiji and Papua New Guinea) declined from 1,200 to 800 g/capita/day.

This reduction in production creates high exposure to food insecurity, notably for highly subsistence-dependent countries like Solomon Islands. Cash commodity production has continued in Fiji and increased in Solomon Islands and Vanuatu. Copra, sugarcane and kava have seen increased attention because they drive economic development in rural areas. Furthermore, input costs, more variable seasonal conditions, incentives to grow specific cash or food crops and the pressure to reduce the complexity of crop rotations have all resulted in much lower crop diversity than ever before, predisposing the region to system-wide shocks. In Solomon

Islands, one key informant said, ‘Farmers have noticed low crop yields and declining soil fertility, notably because of intensive cultivation. They no longer practice the shifting cultivation, and the land pressure is there in high population areas.’ Group 3 countries have historically had greater capacity to produce food and meet national vegetable and fruit requirements based on domestic production, while Group 1 and Group 2 countries face greater deficits in fresh food production (McGregor et al 2009).

Marine production systems play a critical economic role, but they are exposed to a variety of pressures. Kiribati, for example, has one of the largest commercial tuna fisheries in the region (Gillett & Tuati 2018), with up to 75% of government revenue coming from oceanic fisheries’ access fees (Gillett 2016). National fisheries in Vanuatu, Solomon Islands and Kiribati are highly lucrative foreign-owned enterprises (Barclay & Cartwright 2007). Of the fish consumed in rural areas in the Pacific, 60–90% comes from subsistence fishing activities (Bell et al 2009). The contribution of coastal fisheries to communities is often understated, and pressure on marine ecosystems creates risks for these dependent communities (SPC 2015). Warming oceans will create further risks to food security for communities who rely on fishing.

Group 1 countries face additional exposures because of their geological composition. Nutrient-deficient soils with low water-holding capacity make agriculture very hard in these nations (Halavatau 2018). A key Tuvalu informant noted that ‘the ongoing challenges in making and sourcing compost for agriculture make it hard for us to grow staple foods’. These land limitations mean that fisheries are a major food production sector in Group 1 countries, contributing 8.6% of gross domestic product in Kiribati and 9.4% in Tuvalu (Gillett & Tuati 2018). The

inability to meet consumer demand due to limited land makes Group 1 and Group 2 countries highly dependent on a globalised food system (Taylor et al 2016).

### *Socioeconomic*

#### *Globalisation of food systems*

Since the 1980s, there has been a marked acceleration of the globalisation of Pacific food systems. Food imports increased in parallel with a decline in total agricultural output (Farrell et al 2020). Globalisation of food systems has also allowed substantial access to international markets for fish exports, notably tuna (Gillett 2016). It has also increased the availability of imported food, including sugary and high-energy food and beverages. Diverse diets and food staples have been increasingly substituted for more affordable, high-calorie foods, contributing to an increase in non-communicable diseases (Charlton et al 2016). Imported foods, however, are essential for Pacific islands that have limited fresh food production capacity (for example, Kiribati and Tuvalu). Dependence on these international systems exposes communities to price fluctuations of commodities in global markets. At this stage of the COVID-19 pandemic, international food prices have remained relatively stable, but the region is particularly sensitive to fluctuations in global prices, which may occur in the upcoming Northern Hemisphere winter.

#### *Health and nutritional constraints*

The top two risk factors causing the greatest burden of disease in the Pacific are malnutrition (including nutritional deficiencies) and dietary risks (including diabetes, kidney disease and cardiovascular diseases) (IHME 2018). The six countries in this assessment for which data are available (which excludes Tuvalu) all have a higher prevalence of diabetes and kidney disease than the global average, which is increasing (Figure 5.1). While the prevalence of

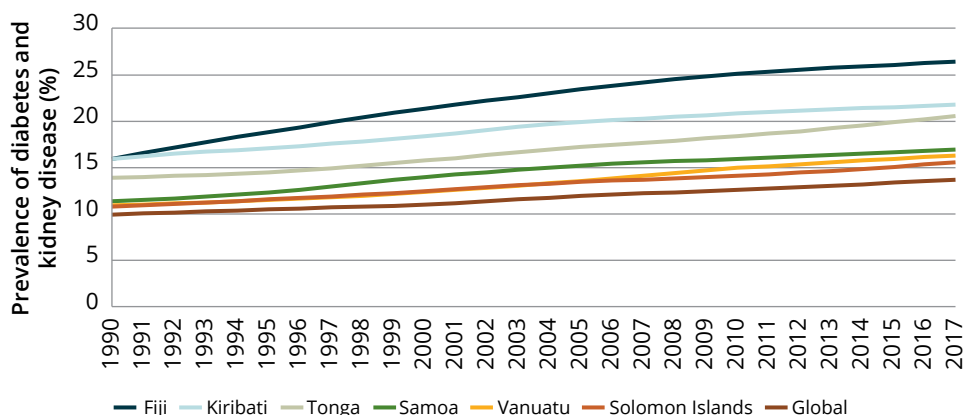
nutritional deficiencies in the region has been generally decreasing over the last decade, in four of these six countries they remain higher than the global average. In Kiribati, Solomon Islands and Vanuatu, over 35% of the population suffers from nutritional deficiency (IHME 2018).

A summary of nutritional conditions in three Pacific regions compared to global averages is presented in Table 5.3. These pre-existing conditions may be exacerbated by the COVID-19 pandemic as a result of potential changes in diet because of reduced income (Tin et al 2020).

#### *Services and remittances*

Tourism and associated services are major employers in the Pacific, notably in Vanuatu, Fiji, Tonga and Samoa. Tourism makes a substantial contribution to the gross domestic product of several Pacific countries in this assessment (30% in Samoa, 38.9% in Fiji and 45% in Vanuatu). Tourist-related services provide 80.2% of total employment in Samoa, 47.8% in Fiji, 39.9% in Tonga, 32.5% in Vanuatu and 29.7% in Solomon Islands (FAO 2020d). Tourism also creates much of the domestic demand for produce, boosting farm incomes for those delivering to restaurants and resorts. In 2017, hotels and resorts in Fiji's main tourism areas spent 74.4 million Fijian dollars (FJ\$) (A\$50 million) on fresh produce.

Remittances make significant contributions to social protection in the Pacific, although their aggregate flow varies widely across the region. Remittances respond to needs (personal shocks and natural disasters) and enable customary obligations to be met or increased. Evidence from Fiji and Tonga reveals that remittances have a greater impact on poor households than wealthier households. Tonga and Samoa rely heavily on remittances. According to recent analysis (SPC 2020a), the contributions of remittances to gross domestic product in 2018 was 40.7% in Tonga and 16.4%



**Figure 5.1** Prevalence of diabetes and kidney disease in six Pacific island countries (1990–2017)

Source: IHME (2018)

**Table 5.3** Malnutrition and obesity in the Pacific region

Nutritional condition	Melanesia (%)	Polynesia (%)	Micronesia (%)	Global average (%)
Anaemia (women of reproductive age)	35.9	27.9	25.1	32.8
Stunting (children under 5 years)	49.5	4.9	no data	21.9
Wasting (children under 5 years)	13.3	3.9	no data	7.3
Overweight (children under 5 years)	13.7	5.3	no data	5.9
Diabetes (men)	15.3	22.4	21.7	9
Diabetes (women)	14.8	26.4	22.8	7.9
Obesity (men)	17.5	54.9	43.6	10.5
Obesity (women)	26.8	40.7	53.1	14.7

Notes: Melanesia = Fiji, Papua New Guinea, Solomon Islands, Vanuatu; Polynesia = Samoa, Tonga, Tuvalu; Micronesia = Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau.

Source: Based on data from the Global Nutrition Report (2020)

in Samoa. Remittances are important for cushioning economic shocks. They play a critical role in household income, given the limited capacity of many Pacific governments to provide cash-based social protection (Edwards 2020).

#### *Vulnerable populations*

Poverty is known to exacerbate food insecurity. In urban areas with limited

capacity to grow food, loss of employment can rapidly amplify food insecurity. Urban and informal workers in the economy are vital for keeping food systems functioning, especially in Group 3 countries. For example, in Port Vila (Vanuatu) and Honiara (Solomon Islands), farmers often commute from rural areas to central markets, staying overnight until produce is sold. Income earned by food stallholders

and street vendors is used to buy food. This can stop quickly if markets are shut down. In Fiji, 140,000 people live in informal settlements, while in the Solomon Islands, 17,000 of the 50,000 people in Honiara are estimated to live in informal settlements (Chand & Yala 2008, ADB 2017). Key informants noted that ‘it is the urban poor that will be very affected by [the COVID-19 pandemic] in the long term’.

Women are also expected to be significantly more disadvantaged than men by the COVID-19 health and economic impacts (FAO 2020c). Women in the Pacific are potentially more exposed to extreme food system shocks, given their often hidden and under-recognised role in the economy. For example, the number of women in Fiji in formal employment is 106,680, compared with 234,059 men (COVID-19 Gender Working Group 2020). However, these figures do not include women who are the majority of market food vendors, acting as middle-agents between producers and consumers (UN Women 2016). Furthermore, the crisis has exposed women throughout the region to heightened domestic violence, the burden of extra home and caring roles, and economic disadvantages (CARE 2020).

Youth are also exposed and vulnerable to socioeconomic shocks. The Pacific has a very young population. More than 50% of the population of the 22 Pacific nations (including Papua New Guinea) is under the age of 25 (SPC 2014). Unemployment is a major concern, with average youth unemployment at 23% compared with the global average of 12%. Consideration of the region's demography is critical to long-term food systems planning, especially with respect to labour.

### 5.4.3 Impacts of COVID-19

The COVID-19 crisis has had different impacts on the seven countries, and these impacts have interacted with pre-existing

exposures. Many of the findings presented here confirm the potential impacts identified by Farrell et al (2020). The impacts reported for June and July 2020 are:

- The combination of reduced tourism and remittances has affected incomes.
- Reduced income has had flow-on effects, such as outmigration to rural areas in Solomon Islands, increased pressure in some coastal fisheries and heightened burdens on women.
- There has been increased demand for planting materials. In Fiji and Solomon Islands, this has been supported by stimulus packages, but access has been more limited in the Group 1 and 2 countries.
- Prices have fluctuated (both up and down) in the region, despite food supplies remaining relatively stable.
- The urban poor are the most affected, because of movement restrictions and the increasing prices of some commodities. Women face increasing pressures to provide for households.
- Some communities in northern Vanuatu have experienced serious food scarcity because of Tropical Cyclone Harold.
- Logistics disruptions have impacted exports, but food has continued to flow into import-dependent nations.

### Food production

Agricultural production and fishing have been adversely impacted by the restrictions on people moving within and between islands, and the availability of farming supplies. Countries impacted by Tropical Cyclone Harold, especially severely affected Vanuatu and Tonga, faced increased production challenges.

Some citizens working overseas have been unable to return home, which has affected labour availability in Samoa and Tonga. Where people have been able to return to rural areas in Solomon Islands and Fiji,

labour shortages have not been as severe. One respondent noted that communities in parts of Fiji are now farming in groups and learning from each other in order to expand food production on previously unused land.

COVID-19 control measures combined with Tropical Cyclone Harold in Tonga, Fiji, Solomon Islands and Vanuatu have impacted food production in some provinces. The impacts of Tropical Cyclone Harold in Vanuatu were severe: 95% of homes were destroyed in Pentecost, crop damage ranged from 50% to 100% and 27% of the population is estimated to have been displaced (Refugees International 2020). FAO's situational assessment in May 2020 estimated that 17,500 ha of cropland has been affected (FAO 2020e). With the loss of home gardens and crops, it is expected that fishing will increase in the near future in areas where boats were not destroyed. This could concentrate pressure in some coastal fisheries. In Vanuatu, a key informant noted that 'raising awareness of intercropping of kava with food crops to encourage resilience in times of disaster' is essential to build buffers. Cash commodity (kava) dependence in Pentecost was due to a surge in prices after Tropical Cyclone Pam, when people neglected planting of food gardens. The island is now dependent on food relief because of Tropical Cyclone Harold. The inevitable upcoming cyclones in the region will create future stressors to food security. Climate-resilient planting and storage strategies are essential for long-term food security.

### *Impacts of rural migration on ecosystems*

As of July 2020, lockdowns in most Pacific nations had eased. Many residents of urban and informal settlements who moved back to rural areas in response to the lockdowns are now starting to return to the cities, although this rate of return is tempered by employment opportunities. Between April

and July 2020, rural population pressures increased due to an influx of returning urban migrants. Recent migratory analysis from Malaita and the Russell Islands (both part of Solomon Islands) revealed an increase in rural populations, as much as 7.1% in the Russell Islands (Eriksson et al 2020, Piturara 2020). This resulted in an estimated 25–50% more fish being caught and, in some cases, size limits for clams, crayfish, trochus and coconut crabs being ignored. Further anecdotal evidence includes accelerated rates of land clearing to re-establish food gardens.

The movement of people back to rural areas has created pressures on agriculture and fisheries to meet additional local demand. In the Malaita province, Eriksson et al (2020) found that 91% of respondents surveyed believed there were more people in the villages since the lockdown. They also found that, although there have been relatively stable immediate food supplies in the villages, there is increasing concern for the long-term stability of food supplies if lockdowns continue.

### *Farming supplies*

Key informants noted increased demand for planting materials, seeds and gardening equipment, particularly in Group 3 islands. In Fiji, this demand has been partially met by the government's stimulus package, which distributed 11,602 seedling packages to citizens, focusing on corporate employees who are unemployed due to the COVID-19 crisis. In Solomon Islands, government and farmer organisations have enhanced seed distribution and access via a stimulus package offered to larger-scale agricultural and fisheries operators. The package selection criteria exclude some of the most vulnerable, poor or those without clear land titles or evidence of ownership.

In Group 1 countries, the availability of seed, planting material and other agricultural products is a common barrier to farming.



The COVID-19 crisis has stimulated increased demand, adding to pre-existing supply constraints. The availability of agricultural products could be further compromised in the near future if travel restrictions and/or reduced transportation comprise supply networks. Tenuous supply and inherently lower soil fertility across this group may serve as a multiplier of food stress in the months to come.

In Group 2 countries, enhanced demand for seeds and planting material has also been observed. A key informant from Samoa noted that ‘Since the lockdown, so many things have emerged that we have never seen before. For example, we’ve never seen stores closed for seeds—because borders were closed, farmers complain that there are not enough seeds.’ Respondents in Tonga noted that many of the seeds come from Australia and New Zealand. They have also noticed a reduction in seed availability.

### *Distribution and marketing*

Group 3 countries have seen a reduction in export and marketing opportunities, particularly in nations where there is a dependence on a small number of logistics options. In Fiji, the horticulture and export sectors are highly dependent on Fiji Airways and have been significantly affected by a reduction in the number of flights and increased freight costs. In Group 1 and 2 countries, dependencies on a limited number of logistics providers is particularly acute. Reduced transport frequency and increased freight costs resulting from the COVID-19 pandemic have exacerbated existing distribution and marketing problems. A key informant from Samoa said, ‘Exports are being impacted, overall we are seeing a reduction in our exports, and this is directly impacting farmers. Fish, taro and noni are the commodities most affected.’

### *Demand, prices and consumption*

Reduced incomes due to COVID-19-related job losses in tourism, commercial and

government sectors have already resulted in changes in patterns of food consumption. Reports suggest an increase in the consumption of foods with lower nutrient density (such as rice), which have remained relatively cheap. This may be particularly felt in informal settlements, where there is no ability to grow food.

Despite the substantial reduction in demand for fresh produce from hotels and restaurants (for example, in Fiji and Vanuatu), the existing supply of fresh produce is not being made available due to local market closures and travel restrictions in Group 1 countries. Fresh food remains available in Samoa and Tonga. A significant increase in farm-gate selling has occurred, resulting in greater food availability in some rural areas. Travel restrictions and reduced logistics have decreased the volume of produce making its way to urban areas and informal settlements.

### *Food price fluctuations*

Food prices have fluctuated in some countries in the region more than others. Prices have both increased and decreased and there is no common pattern. In Fiji, for example, it was reported that the price for a fish had declined from FJ\$45 (A\$29) to FJ\$25 (A\$16). The price of pineapples was also down from FJ\$5 (A\$3) for a heap to FJ\$2.50 (A\$1.50). The Solomon Islands government enacted a policy to prevent price hikes of staples, but prices have still increased. Informants have observed a doubling in price of commodities outside of Honiara. In Malaita, 48% of respondents noticed higher prices for rice and 46% noticed higher prices for canned tuna (Eriksson et al 2020). A key informant confirmed that ‘another challenge has been the ability to sell food at the market, meaning that we are now selling at the farm gate’.

In Samoa it was reported that prices have remained relatively stable for commodities such as coconut (WS\$0.90/A\$0.50 per kg)



# 5 COVID-19 and food systems in Pacific island countries

---

**Dr Federico Davila**

Institute for Sustainable Futures, University of Technology Sydney

**Bronwyn Wilkes**

Fenner School of Environment and Society, Australian National University

## 5.1 Abstract

Pacific island countries continue to rely on agriculture and fisheries for economic development and livelihoods. In the seven focal countries comprising this assessment (Kiribati, Tuvalu, Samoa, Tonga, Solomon Islands, Vanuatu, Fiji), COVID-19 has had limited health impacts to date, due to the rapid interventions of governments. However, COVID-19 has had major economic impacts, and these have intersected with existing social vulnerabilities and environmental exposures. These impacts can increase poverty and food insecurity.

The region has seen a series of recovery strategies centred on supporting agricultural production, continuation of markets, enabling local supply chains and learning from disaster preparedness strategies. Demonstrated characteristics of food systems resilience identified include the interaction of livelihood strategies with immediate shocks, such as COVID-19, and the underlying potential of future shocks, such as cyclones. Opportunities for livelihoods based on food systems activities to withstand shock are dependent on the ability of agricultural and fishery systems to adapt to change.

Future food systems can be supported through investments at different timescales. Short-term measures can leverage the current interest in agriculture to support food security, and build immediate strategies to support farming and fishing adaptive capacity in light of upcoming cyclones. There are intermediate-term opportunities to evaluate the outcomes of recovery measures and support existing business and environmental development needs. Longer-term opportunities address the underlying determinants of future food systems exposures, notably enabling future employment opportunities in food sectors, creating food-based social protection systems and addressing gender structural inequalities.

## 5.2 COVID-19 in Pacific island countries

### 5.2.1 Focal countries overview (July 2020)



#### Land use

Small islands average 1,336 km<sup>2</sup>  
(51% agriculture)  
Medium islands average 3,893 km<sup>2</sup>  
(29% agriculture)  
Large islands average 64,058 km<sup>2</sup>  
(14% agriculture)  
20.6% GDP from agriculture  
and fish (average)



#### Population

Small islands 130,000 people  
Medium islands 299,000 people  
Large islands 1,867,945 people  
62% rural (average)  
Adjusted income per capita  
US\$3,343 (average)



#### COVID-19 and health

First recorded cases:  
18 March (Samoa); 19 March (Fiji)  
At 3 August: 509 known cases;  
8 deaths\*  
Cases in 6 out of 21 countries  
(excluding PNG)



#### Local response to COVID-19

State of emergency: March 2020  
(all 7 countries)  
Rapid closure of national borders  
Quarantine established,  
from 14 to 28 days  
Suspension of schools, mass  
gatherings; changes to working  
arrangements



#### Agriculture and fisheries

Top staples: coconut,  
taro, cassava, bananas,  
sweetpotato, yams  
Low farm productivity; traditional  
farming and fishing practices  
Primary production focuses  
on domestic markets



#### Key risk multipliers

Climate impacts, declining fresh  
water resources  
Agricultural and biosecurity risks  
Persistent malnutrition  
and dietary issues

\* Of the seven focal countries, all but Fiji were COVID-19 free at the conclusion of the assessment. Fiji reported 21 confirmed cases as of 9 July 2020.

### 5.2.2 Development context

Pacific food systems are diverse and complex, spanning various different geographies and agroecological environments (McGregor et al 2009, Taylor et al 2016). For this assessment, seven Pacific island countries have been selected on the basis of a typology of island groupings (Table 5.1):

- smaller (Kiribati, Tuvalu)
- medium (Samoa, Tonga)
- larger (Solomon Islands, Vanuatu, Fiji).

This allows the impacts of COVID-19 to be differentiated geographically and is consistent with other Pacific studies that have examined food systems shocks (Taylor et al 2016) and with regional development in food systems programming (Bell & Taylor 2015, Bell et al 2016, SPC 2016, SPC 2020b).

Pacific island countries comprise more than 2,000 islands and atolls in 22 countries and territories. While the region covers one-third of the Earth's surface, the total land area is only approximately 550,000 km<sup>2</sup>, representing 2% of the entire 30,000,000 km<sup>2</sup> of the Pacific region (Barnett 2011). This land area is home to approximately 2.3 million people (excluding Papua New Guinea), of

which half live within 1 km of coastal areas (Andrew et al 2019), and a rapidly growing number around major cities. Urbanisation in Pacific island countries is happening three times faster than the global average (UN Habitat 2015), and by 2050 over 50% of the Pacific population is expected to live in urban areas (UNESCAP 2018).

Pacific island countries have a rich history of traditional land and marine systems management that continues to influence how communities manage their natural resources (Campbell 2015, Wairiu 2017). Pre-colonial food systems were characterised by diverse activities surrounding food production and exchange, which included a mix of subsistence farming and hunter-gatherer food harvesting systems, bartering and regional trade between islands. Nutrient-rich diets with leafy vegetables and complex carbohydrates were the norm, with plant foods constituting 83% of the diet and poultry, fish, and pigs making up the protein and micronutrient requirements of many Pacific island people (Connell 2015, Charlton et al 2016, Gnechchi-Ruscione & Paini 2017). With the surge of trade liberalisation in the mid-1990s, the region experienced a rapid increase of cheap imported processed foods such as noodles, rice and wheat (Plahe et al 2013,

**Table 5.1** Typology of Pacific food systems

Group	Typical geologies	Nations in this assessment	Population (est. '000)	Total island area ('000 km <sup>2</sup> )
Group 1: smaller islands	small reef and composite islands	Kiribati	120	0.81
		Tuvalu	10	0.03
Group 2: medium islands	volcanic, limestone and composite islands	Samoa	199	2.84
		Tonga	100	0.75
Group 3: larger islands	mix of composite, limestone and sand-based islands	Solomon Islands	667	28.4
		Vanuatu	305	12.2
		Fiji	895	18.3
<b>Total</b>			<b>2,296</b>	<b>63.3</b>

Charlton et al 2016). These imports have slowly shifted eating habits, and have been accompanied by increasingly sedentary lifestyles, both of which contribute to the substantial burden of non-communicable diseases in the region, including stunting, micronutrient deficiencies, obesity and diabetes.

### *Variations between countries*

The contribution of agriculture and fisheries to livelihoods varies between countries (Table 5.2), but primary food production remains core to the region's economies.

Group 3 countries have highly diverse food production and differentiated dependence on rural livelihoods. For example, in Solomon Islands and Vanuatu, rural livelihoods are crucial for development, with 70–80% of the population living in rural areas in both countries and involved to some degree in agriculture and/or fishing. In Fiji, less than half of the population lives in rural areas. The contribution of agriculture to gross domestic product also varies, from approximately 35–40% in Solomon Islands to 15–20% in Vanuatu and less than 10% in Fiji, reflecting the higher reliance on tourism in Fiji and Vanuatu than Solomon Islands. The scale of agriculture is most pronounced in Vanuatu, with over 1.5 Mha under some agricultural use, to 800,000 ha in the Solomon Islands and 400,000 ha in Fiji (FAO 2020b).

The medium-sized Group 2 countries have lower capacity for food production, and much higher trade deficits given their reliance on imported foods (McGregor et al 2009). In Tonga, over 77% of the population lives in rural areas and agriculture takes up 45.8% of land and contributes to 15–20% of gross domestic product. In Samoa, 82% of the population live in rural and peri-urban areas, and agriculture occupies 12.4% of land and contributes to 10–20% of gross domestic product (Sialoa 2019). In Samoa, the rate

of participation in subsistence agriculture is 60%, indicating strong dependence on farming for immediate food security.

The smaller Group 1 atoll countries are more reliant on fisheries than agriculture, given the land resource and freshwater constraints. Approximately 40% of the populations of both Tuvalu and Kiribati live in rural areas. Agricultural land makes up 42% of Kiribati and 60% of Tuvalu, contributing to approximately 24% of gross domestic product in Kiribati and 17% in Tuvalu.

### *Agriculture*

The economic contribution of agriculture is derived from two major sources: commodity and non-commodity exports. Commodity exports are most pronounced for the larger countries. Solomon Islands, for example, has approximately 40,000 households growing coconuts and 20,000 growing cocoa as export cash crops. Cash crops for export are also common in Fiji (notably sugar and coconuts) and in Vanuatu (kava). Non-commodity horticultural exports are also very important for the region, contributing approximately A\$66 million of agricultural export value (McGregor 2007). These horticultural products include a variety of root crops, vegetables and fruits frequently consumed by diaspora communities in Australia, New Zealand and the United States.

### *Fisheries*

Fisheries resources of the Pacific provide a major source of food and income for multiple countries, and offer substantial economic prospects for the region, especially for countries with limited land (Gillett & Tuati 2018). Fisheries in the region fall under two main categories: oceanic, with tuna being the region's primary catch, and coastal, which includes multiple fish species as well as cephalopods, crustaceans, shellfish and eels.

**Table 5.2** Agricultural, fisheries and nutrition context of Pacific island countries

Indicators		Unit
Surface area <sup>a</sup>		'000 km <sup>2</sup>
Agricultural land <sup>b</sup>		percentage of land area
Age of population <sup>a</sup>	0–19 years	percentage of total population
	20–39 years	percentage of total population
	40–59 years	percentage of total population
	over 59 years	percentage of total population
Stunting rate <sup>c</sup>	under 5 years	percentage of age group
Wasting rate <sup>c</sup>	under 5 years	percentage of age group
Overweight <sup>c</sup>	under 5 years	percentage of age group
	male	percentage of total population
	female	percentage of total population
Obesity <sup>c</sup>	male	percentage of total population
	female	percentage of total population
Prevalence of undernourishment <sup>c</sup>		percentage of total population
Population distribution <sup>a</sup>	rural	percentage of total population
	urban	percentage of total population
Gross domestic product per capita <sup>a</sup>		US\$
Adjusted net national income per capita (2018) <sup>a</sup>		US\$
Agriculture and fisheries, value added <sup>f</sup>		percentage of gross domestic product (2018)
Government expenditure on agriculture	FAOSTAT	percentage of total outlays
	National statistics	percentage of total outlays
Top staples		ranked most to least

UNDP Human Index ranking (2019) <sup>d</sup>	out of 189
--	------------

2017 World Risk Index (mean value calculation 2012–2016) <sup>e</sup>	out of 171
---	------------

a World Bank (2020)

b FAO (2020a)

c Global Nutrition Report (2020)

d UNDP (2020)

e Bündnis Entwicklung Hilft (2017)

f Samoa Bureau of Statistics (2016)

g CBSI (2007)

h FAO (2011)

i Government of Tuvalu (2016)

j Government of Samoa (2016)

k Government of Solomon Islands (2015)

l Government of Vanuatu (2015)

Data collated on 10 July 2020 by Alex van der Meer Simo.

Group 1		Group 2		Group 3		
Kiribati	Tuvalu	Samoa	Tonga	Fiji	Solomon Islands	Vanuatu
0.81	0.03	2.84	0.75	18.3	28.4	12.2
42	60	12.4	45.8	23.26	3.9	15.3
45	no data	48	46.1	37.8	50.5	48
32	no data	27	27.4	31.3	28.5	30
18	no data	18	17.8	21.9	15.5	16
6	no data	7	8.4	8.7	5.4	6
no data	10	4.9	8.1	7.5	31.6	28.5
no data	3.3	3.9	5.2	6.3	8.5	4.4
no data	6.3	5.3	17.3	5.1	4.5	4.6
77	80	74	75	60	50	52
81	84	82	82	68	60	62
42	47	40	41	35	18	20
50	56	55	54	25	27	30
3.2	3.3	2.7	no data	3.7	8.9	7.2
46	38	82	77	44	76	75
54	62	18	23	56	24	25
3,894	3,701	4,183	4,364	6,267	2,138	3,214
2,980	no data	3,574	4,040	5,137	1,469	2,859
30.8	16.5	9.8	17.2	9.2 (2012)	35	25.8
no data	no data	7	no data	4.4	no data	3.9
no data	no data	3.3 <sup>f</sup>	no data	no data	>2% <sup>g</sup>	no data
coconut, banana, taro, copra, breadfruit <sup>h</sup>	coconut, pulaka, banana, breadfruit, taro, cassava, sweetpotato, pawpaw, pumpkin <sup>i</sup>	taro, chicken, fish, canned mackerel, rice, banana, brown sugar, coconut, bread, instant noodles <sup>j</sup>	coconut, cassava, sweetpotato, yam, taro, banana <sup>h</sup>	coconut, taro, cassava, sweetpotato, rice, cereals, banana, yam, maize <sup>h</sup>	rice, sweetpotato, cassava, yam, taro, banana, pumpkin, vegetables, coconut, livestock <sup>k</sup>	taro, yam, cassava, sweetpotato <sup>l</sup>
132	not listed	111	105	98	153	141
165	not listed	not listed	2	15	6	1

Coastal fisheries provide the primary or secondary source of income for up to 50% of households, and 50–90% of the animal-sourced protein consumed (SPC 2015). The dependence on fisheries for household food security and incomes, as well as government revenue, is pronounced in Kiribati and Tuvalu, where 8–10% of their gross domestic product is obtained from fisheries. Group 2 and 3 countries have lower proportions of gross domestic product from fisheries: 1% for Vanuatu and 3% for Samoa (Gillett 2016). Aquaculture has been introduced in some countries as a way of reducing pressure on fisheries; however, this has not been upscaled.

### 5.2.3 Status of COVID-19 in Pacific island countries

As of 7 July 2020, six out of 21 Pacific island countries (excluding Papua New Guinea) have reported a total of 449 cases of COVID-19 and seven deaths (WHO 2020). The limited spread of COVID-19 has been largely due to individual governments taking rapid action to shut down borders, limit domestic travel, establish curfews and put in place physical distancing measures. Of the nations assessed, all but Fiji remain COVID-19 free. Fiji reported 21 confirmed cases as of 9 July 2020.

States of emergency were established in all seven countries assessed, and Vanuatu has extended this until 31 December 2020. Pacific island responses to managing the COVID-19 outbreak and subsequent livelihood and economic implications have been varied. During the early stages of the pandemic in the region (March 2020), there was a rapid closure of national borders and various quarantine periods were enforced for people entering the country: from 14 days in Solomon Islands, Samoa and Tonga to up to 28 days in Fiji. Sea freight has continued, albeit with lesser frequency.

The region has limited health services and social protection programs, most notably in Group 1 and 2 countries. A number of government stimulus packages have started to emerge in the region. A comprehensive overview of nation-specific responses to the crisis is provided at the Australian National University's Australia Pacific Security College website ([psc.crawford.anu.edu.au](http://psc.crawford.anu.edu.au)).

## 5.3 Assessment approach

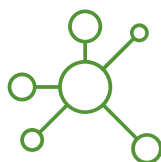
This assessment is based on interviews with 21 key informants (7 women) who were working in agriculture or fisheries, and/or supporting rural communities and development activities related to food security and agrifood production. A list of potential key informants was generated by collating contacts from a range of sources including the research team, the Australian Council for International Development (ACIAR) Country Manager and author networks in the region. Interview questions were designed to provide key information related to the resilience and food systems analytical framework (Chapter 2).

Interview data was triangulated with rapidly emerging published material. This included regional documents on impacts on agriculture and fisheries (FAO 2020de, PIFON 2020), social vulnerability indicator data (SPC 2020a) emerging empirical research findings (Eriksson et al 2020, Piturara 2020), and peer-reviewed literature (Béné 2020, Farrell et al 2020). Triangulation also took place through active participation during the World Food Programme Regional Pacific Food Security Cluster Meetings held on 13 May and 30 June 2020. Informal discussions also took place to understand the alignment of this work with ongoing assessments by International Fund for Agricultural Development and the Pacific Island Farmer Organisations Network as well as the World Food Programme's Mobile Vulnerability Analysis.



## 5.4 Assessment results

### 5.4.1 Snapshot of key findings



#### Smallholders

Farmers, fishers impacted by movement restriction and input availability  
Tropical Cyclone Harold increased production challenges in affected countries  
Return to rural areas increased food demand and agricultural pressure



#### Supply chains

Disruption to limited distribution services problematic on small and medium islands  
Reduced demand for exports from large islands  
Tourism decline has ongoing impacts for farm incomes  
Local market closures; reduced availability of fresh produce



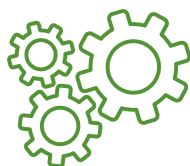
#### Governance

Domestic travel restrictions eased in July  
Some governments enacted price stabilisation for staples  
Limited formal social protection; support activities include distribution of planting material, support for fishing



#### Community

Increased tension over 'idle' and disputed land  
Changes in food consumption; cheaper, less nutritious foods  
Impacts on women include exclusion from workforce, particularly food markets

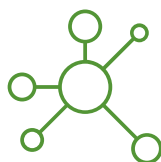


#### Employment

Reduced income from tourism a major concern  
Reduction in remittances across the Pacific  
Poverty likely to increase as economies contract  
Pandemic worsens existing challenge of high youth unemployment

## 5.4 Assessment results

### 5.4.1 Snapshot of key findings



#### Smallholders

Farmers, fishers impacted by movement restriction and input availability  
Tropical Cyclone Harold increased production challenges in affected countries  
Return to rural areas increased food demand and agricultural pressure



#### Supply chains

Disruption to limited distribution services problematic on small and medium islands  
Reduced demand for exports from large islands  
Tourism decline has ongoing impacts for farm incomes  
Local market closures; reduced availability of fresh produce



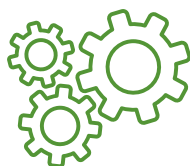
#### Governance

Domestic travel restrictions eased in July  
Some governments enacted price stabilisation for staples  
Limited formal social protection; support activities include distribution of planting material, support for fishing



#### Community

Increased tension over 'idle' and disputed land  
Changes in food consumption; cheaper, less nutritious foods  
Impacts on women include exclusion from workforce, particularly food markets



#### Employment

Reduced income from tourism a major concern  
Reduction in remittances across the Pacific  
Poverty likely to increase as economies contract  
Pandemic worsens existing challenge of high youth unemployment

### 5.4.2 Exposure and vulnerabilities

This section is organised around two major categories of food systems' exposure and vulnerabilities: biophysical and socioeconomic. The main exposures discussed are:

- climate and water risk, and associated loss of arable land
- pests, diseases and biosecurity
- farming practices, coastal fisheries and specific atoll exposures
- globalisation of food systems
- health and nutritional constraints
- services and remittances
- vulnerable populations.

The section draws from analysis of food systems vulnerability already conducted for the Pacific region and integration of findings from key informant interviews.

#### *Biophysical*

##### *Climate and water risk and associated loss of arable land*

Agricultural production has been and will continue to be pressured by freshwater availability and extreme climate events. Key informants from all three island groups identified the loss of arable land and reduction of continuity of food production from extreme events and sea level rise exposures as factors that will multiply the impacts of the COVID-19 pandemic on food systems. Tonga and Vanuatu have already experienced the multiplier effect through the combined impacts of Tropical Cyclone Harold and the COVID-19 crisis. Group 1 and 2 food production systems are exposed to anthropogenic sea level rise, which since 1994 has been 3–10 mm per year and resulted in coastal erosion and loss of land. The combination of loss of land and extreme weather events will continue to create risks for food systems. In prioritising actions, key informants from Samoa and Tonga noted this by stating that

'natural disasters must be on the list of our top risks', and that 'the major ongoing threat to our root crops is climate change'. There is evidence of the cost of cyclones to food production. In the immediate aftermath of Tropical Cyclone Winston in Fiji in 2015, agriculture was the worst hit part of the economy, with losses of A\$368 million (Sleet 2019). In Vanuatu, Tropical Cyclone Pam in 2015 destroyed up to 80% of crops (Cvitanovic et al 2016).

Water-related exposures and risks also amplify food systems insecurity. The combination of sea level rise with limited fresh surface water and groundwater creates another exposure through saltwater intrusion (Leal Filho et al 2020). This depresses agricultural production and represents a geopolitical security risk in the region. Fast-growing populations place pressure on very limited freshwater resources, and the inability to manage this in the context of high dependence on agriculture for livelihoods (notably in Solomon Islands) creates risks for political stability and food security.

##### *Pests, diseases and biosecurity*

Pathogens and pests continue to threaten agricultural and aquatic production in the Pacific. Island environments have inherently limited biological resilience in the face of aggressive invasive species, due to limited natural predators and relatively low genetic diversity. The risk of pests and diseases increases as genetic diversity declines. Multiple biosecurity risks have resulted in substantial food insecurity as well as negative impacts on nutrition, farmer incomes, export earnings and balance of payments (McGregor et al 2011). Biosecurity remains a major risk to traditional food consumption, with pathogens like taro leaf blight responsible for a 55% reduction in Samoan gross domestic product in 1994 and estimated annual losses of A\$11 million between 1994 and 1999 (Singh et al 2012,

Alexandra et al 2020). The current emergence of the coconut rhinoceros beetle, coupled with an emerging disease—Bogia coconut syndrome (a Solomon Island local variant of coconut lethal yellowing), predisposes these agricultural systems to shocks like the COVID-19 pandemic. The risk of African swine fever and fall armyworm (both of which are now in Papua New Guinea) spreading east also threatens food systems.

*Farming practices, coastal fisheries and specific atoll exposures*

Farming in the Pacific uses very limited land, coastal fisheries are under substantial pressure and agroecological diversity has declined. The Pacific region has the smallest landholdings in the world, with an average holding of 1 ha, and an average of 3.2 parcels per holding (FAO 2000). For most of the Pacific, the total land cultivated by smallholders comprises a sizeable portion of total agricultural land (Taylor et al 2016). Agricultural production in large parts of the Pacific is well below its inherent potential (FAO 2010), with recent analysis by Farrell et al (2020) finding that between 1980 and 2016, crop production in the region (excluding Fiji and Papua New Guinea) declined from 1,200 to 800 g/capita/day.

This reduction in production creates high exposure to food insecurity, notably for highly subsistence-dependent countries like Solomon Islands. Cash commodity production has continued in Fiji and increased in Solomon Islands and Vanuatu. Copra, sugarcane and kava have seen increased attention because they drive economic development in rural areas. Furthermore, input costs, more variable seasonal conditions, incentives to grow specific cash or food crops and the pressure to reduce the complexity of crop rotations have all resulted in much lower crop diversity than ever before, predisposing the region to system-wide shocks. In Solomon

Islands, one key informant said, ‘Farmers have noticed low crop yields and declining soil fertility, notably because of intensive cultivation. They no longer practice the shifting cultivation, and the land pressure is there in high population areas.’ Group 3 countries have historically had greater capacity to produce food and meet national vegetable and fruit requirements based on domestic production, while Group 1 and Group 2 countries face greater deficits in fresh food production (McGregor et al 2009).

Marine production systems play a critical economic role, but they are exposed to a variety of pressures. Kiribati, for example, has one of the largest commercial tuna fisheries in the region (Gillett & Tuati 2018), with up to 75% of government revenue coming from oceanic fisheries’ access fees (Gillett 2016). National fisheries in Vanuatu, Solomon Islands and Kiribati are highly lucrative foreign-owned enterprises (Barclay & Cartwright 2007). Of the fish consumed in rural areas in the Pacific, 60–90% comes from subsistence fishing activities (Bell et al 2009). The contribution of coastal fisheries to communities is often understated, and pressure on marine ecosystems creates risks for these dependent communities (SPC 2015). Warming oceans will create further risks to food security for communities who rely on fishing.

Group 1 countries face additional exposures because of their geological composition. Nutrient-deficient soils with low water-holding capacity make agriculture very hard in these nations (Halavatau 2018). A key Tuvalu informant noted that ‘the ongoing challenges in making and sourcing compost for agriculture make it hard for us to grow staple foods’. These land limitations mean that fisheries are a major food production sector in Group 1 countries, contributing 8.6% of gross domestic product in Kiribati and 9.4% in Tuvalu (Gillett & Tuati 2018). The

inability to meet consumer demand due to limited land makes Group 1 and Group 2 countries highly dependent on a globalised food system (Taylor et al 2016).

### *Socioeconomic*

#### *Globalisation of food systems*

Since the 1980s, there has been a marked acceleration of the globalisation of Pacific food systems. Food imports increased in parallel with a decline in total agricultural output (Farrell et al 2020). Globalisation of food systems has also allowed substantial access to international markets for fish exports, notably tuna (Gillett 2016). It has also increased the availability of imported food, including sugary and high-energy food and beverages. Diverse diets and food staples have been increasingly substituted for more affordable, high-calorie foods, contributing to an increase in non-communicable diseases (Charlton et al 2016). Imported foods, however, are essential for Pacific islands that have limited fresh food production capacity (for example, Kiribati and Tuvalu). Dependence on these international systems exposes communities to price fluctuations of commodities in global markets. At this stage of the COVID-19 pandemic, international food prices have remained relatively stable, but the region is particularly sensitive to fluctuations in global prices, which may occur in the upcoming Northern Hemisphere winter.

#### *Health and nutritional constraints*

The top two risk factors causing the greatest burden of disease in the Pacific are malnutrition (including nutritional deficiencies) and dietary risks (including diabetes, kidney disease and cardiovascular diseases) (IHME 2018). The six countries in this assessment for which data are available (which excludes Tuvalu) all have a higher prevalence of diabetes and kidney disease than the global average, which is increasing (Figure 5.1). While the prevalence of

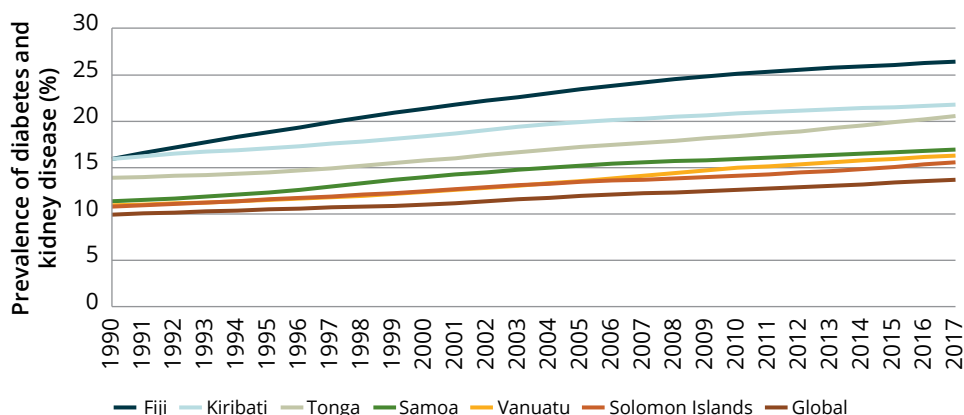
nutritional deficiencies in the region has been generally decreasing over the last decade, in four of these six countries they remain higher than the global average. In Kiribati, Solomon Islands and Vanuatu, over 35% of the population suffers from nutritional deficiency (IHME 2018).

A summary of nutritional conditions in three Pacific regions compared to global averages is presented in Table 5.3. These pre-existing conditions may be exacerbated by the COVID-19 pandemic as a result of potential changes in diet because of reduced income (Tin et al 2020).

#### *Services and remittances*

Tourism and associated services are major employers in the Pacific, notably in Vanuatu, Fiji, Tonga and Samoa. Tourism makes a substantial contribution to the gross domestic product of several Pacific countries in this assessment (30% in Samoa, 38.9% in Fiji and 45% in Vanuatu). Tourist-related services provide 80.2% of total employment in Samoa, 47.8% in Fiji, 39.9% in Tonga, 32.5% in Vanuatu and 29.7% in Solomon Islands (FAO 2020d). Tourism also creates much of the domestic demand for produce, boosting farm incomes for those delivering to restaurants and resorts. In 2017, hotels and resorts in Fiji's main tourism areas spent 74.4 million Fijian dollars (FJ\$) (A\$50 million) on fresh produce.

Remittances make significant contributions to social protection in the Pacific, although their aggregate flow varies widely across the region. Remittances respond to needs (personal shocks and natural disasters) and enable customary obligations to be met or increased. Evidence from Fiji and Tonga reveals that remittances have a greater impact on poor households than wealthier households. Tonga and Samoa rely heavily on remittances. According to recent analysis (SPC 2020a), the contributions of remittances to gross domestic product in 2018 was 40.7% in Tonga and 16.4%



**Figure 5.1** Prevalence of diabetes and kidney disease in six Pacific island countries (1990–2017)

Source: IHME (2018)

**Table 5.3** Malnutrition and obesity in the Pacific region

Nutritional condition	Melanesia (%)	Polynesia (%)	Micronesia (%)	Global average (%)
Anaemia (women of reproductive age)	35.9	27.9	25.1	32.8
Stunting (children under 5 years)	49.5	4.9	no data	21.9
Wasting (children under 5 years)	13.3	3.9	no data	7.3
Overweight (children under 5 years)	13.7	5.3	no data	5.9
Diabetes (men)	15.3	22.4	21.7	9
Diabetes (women)	14.8	26.4	22.8	7.9
Obesity (men)	17.5	54.9	43.6	10.5
Obesity (women)	26.8	40.7	53.1	14.7

Notes: Melanesia = Fiji, Papua New Guinea, Solomon Islands, Vanuatu; Polynesia = Samoa, Tonga, Tuvalu; Micronesia = Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Palau.

Source: Based on data from the Global Nutrition Report (2020)

in Samoa. Remittances are important for cushioning economic shocks. They play a critical role in household income, given the limited capacity of many Pacific governments to provide cash-based social protection (Edwards 2020).

#### *Vulnerable populations*

Poverty is known to exacerbate food insecurity. In urban areas with limited

capacity to grow food, loss of employment can rapidly amplify food insecurity. Urban and informal workers in the economy are vital for keeping food systems functioning, especially in Group 3 countries. For example, in Port Vila (Vanuatu) and Honiara (Solomon Islands), farmers often commute from rural areas to central markets, staying overnight until produce is sold. Income earned by food stallholders

and street vendors is used to buy food. This can stop quickly if markets are shut down. In Fiji, 140,000 people live in informal settlements, while in the Solomon Islands, 17,000 of the 50,000 people in Honiara are estimated to live in informal settlements (Chand & Yala 2008, ADB 2017). Key informants noted that ‘it is the urban poor that will be very affected by [the COVID-19 pandemic] in the long term’.

Women are also expected to be significantly more disadvantaged than men by the COVID-19 health and economic impacts (FAO 2020c). Women in the Pacific are potentially more exposed to extreme food system shocks, given their often hidden and under-recognised role in the economy. For example, the number of women in Fiji in formal employment is 106,680, compared with 234,059 men (COVID-19 Gender Working Group 2020). However, these figures do not include women who are the majority of market food vendors, acting as middle-agents between producers and consumers (UN Women 2016). Furthermore, the crisis has exposed women throughout the region to heightened domestic violence, the burden of extra home and caring roles, and economic disadvantages (CARE 2020).

Youth are also exposed and vulnerable to socioeconomic shocks. The Pacific has a very young population. More than 50% of the population of the 22 Pacific nations (including Papua New Guinea) is under the age of 25 (SPC 2014). Unemployment is a major concern, with average youth unemployment at 23% compared with the global average of 12%. Consideration of the region's demography is critical to long-term food systems planning, especially with respect to labour.

### 5.4.3 Impacts of COVID-19

The COVID-19 crisis has had different impacts on the seven countries, and these impacts have interacted with pre-existing

exposures. Many of the findings presented here confirm the potential impacts identified by Farrell et al (2020). The impacts reported for June and July 2020 are:

- The combination of reduced tourism and remittances has affected incomes.
- Reduced income has had flow-on effects, such as outmigration to rural areas in Solomon Islands, increased pressure in some coastal fisheries and heightened burdens on women.
- There has been increased demand for planting materials. In Fiji and Solomon Islands, this has been supported by stimulus packages, but access has been more limited in the Group 1 and 2 countries.
- Prices have fluctuated (both up and down) in the region, despite food supplies remaining relatively stable.
- The urban poor are the most affected, because of movement restrictions and the increasing prices of some commodities. Women face increasing pressures to provide for households.
- Some communities in northern Vanuatu have experienced serious food scarcity because of Tropical Cyclone Harold.
- Logistics disruptions have impacted exports, but food has continued to flow into import-dependent nations.

### Food production

Agricultural production and fishing have been adversely impacted by the restrictions on people moving within and between islands, and the availability of farming supplies. Countries impacted by Tropical Cyclone Harold, especially severely affected Vanuatu and Tonga, faced increased production challenges.

Some citizens working overseas have been unable to return home, which has affected labour availability in Samoa and Tonga. Where people have been able to return to rural areas in Solomon Islands and Fiji,



labour shortages have not been as severe. One respondent noted that communities in parts of Fiji are now farming in groups and learning from each other in order to expand food production on previously unused land.

COVID-19 control measures combined with Tropical Cyclone Harold in Tonga, Fiji, Solomon Islands and Vanuatu have impacted food production in some provinces. The impacts of Tropical Cyclone Harold in Vanuatu were severe: 95% of homes were destroyed in Pentecost, crop damage ranged from 50% to 100% and 27% of the population is estimated to have been displaced (Refugees International 2020). FAO's situational assessment in May 2020 estimated that 17,500 ha of cropland has been affected (FAO 2020e). With the loss of home gardens and crops, it is expected that fishing will increase in the near future in areas where boats were not destroyed. This could concentrate pressure in some coastal fisheries. In Vanuatu, a key informant noted that 'raising awareness of intercropping of kava with food crops to encourage resilience in times of disaster' is essential to build buffers. Cash commodity (kava) dependence in Pentecost was due to a surge in prices after Tropical Cyclone Pam, when people neglected planting of food gardens. The island is now dependent on food relief because of Tropical Cyclone Harold. The inevitable upcoming cyclones in the region will create future stressors to food security. Climate-resilient planting and storage strategies are essential for long-term food security.

### *Impacts of rural migration on ecosystems*

As of July 2020, lockdowns in most Pacific nations had eased. Many residents of urban and informal settlements who moved back to rural areas in response to the lockdowns are now starting to return to the cities, although this rate of return is tempered by employment opportunities. Between April

and July 2020, rural population pressures increased due to an influx of returning urban migrants. Recent migratory analysis from Malaita and the Russell Islands (both part of Solomon Islands) revealed an increase in rural populations, as much as 7.1% in the Russell Islands (Eriksson et al 2020, Piturara 2020). This resulted in an estimated 25–50% more fish being caught and, in some cases, size limits for clams, crayfish, trochus and coconut crabs being ignored. Further anecdotal evidence includes accelerated rates of land clearing to re-establish food gardens.

The movement of people back to rural areas has created pressures on agriculture and fisheries to meet additional local demand. In the Malaita province, Eriksson et al (2020) found that 91% of respondents surveyed believed there were more people in the villages since the lockdown. They also found that, although there have been relatively stable immediate food supplies in the villages, there is increasing concern for the long-term stability of food supplies if lockdowns continue.

### *Farming supplies*

Key informants noted increased demand for planting materials, seeds and gardening equipment, particularly in Group 3 islands. In Fiji, this demand has been partially met by the government's stimulus package, which distributed 11,602 seedling packages to citizens, focusing on corporate employees who are unemployed due to the COVID-19 crisis. In Solomon Islands, government and farmer organisations have enhanced seed distribution and access via a stimulus package offered to larger-scale agricultural and fisheries operators. The package selection criteria exclude some of the most vulnerable, poor or those without clear land titles or evidence of ownership.

In Group 1 countries, the availability of seed, planting material and other agricultural products is a common barrier to farming.

The COVID-19 crisis has stimulated increased demand, adding to pre-existing supply constraints. The availability of agricultural products could be further compromised in the near future if travel restrictions and/or reduced transportation comprise supply networks. Tenuous supply and inherently lower soil fertility across this group may serve as a multiplier of food stress in the months to come.

In Group 2 countries, enhanced demand for seeds and planting material has also been observed. A key informant from Samoa noted that ‘Since the lockdown, so many things have emerged that we have never seen before. For example, we’ve never seen stores closed for seeds—because borders were closed, farmers complain that there are not enough seeds.’ Respondents in Tonga noted that many of the seeds come from Australia and New Zealand. They have also noticed a reduction in seed availability.

### *Distribution and marketing*

Group 3 countries have seen a reduction in export and marketing opportunities, particularly in nations where there is a dependence on a small number of logistics options. In Fiji, the horticulture and export sectors are highly dependent on Fiji Airways and have been significantly affected by a reduction in the number of flights and increased freight costs. In Group 1 and 2 countries, dependencies on a limited number of logistics providers is particularly acute. Reduced transport frequency and increased freight costs resulting from the COVID-19 pandemic have exacerbated existing distribution and marketing problems. A key informant from Samoa said, ‘Exports are being impacted, overall we are seeing a reduction in our exports, and this is directly impacting farmers. Fish, taro and noni are the commodities most affected.’

### *Demand, prices and consumption*

Reduced incomes due to COVID-19-related job losses in tourism, commercial and

government sectors have already resulted in changes in patterns of food consumption. Reports suggest an increase in the consumption of foods with lower nutrient density (such as rice), which have remained relatively cheap. This may be particularly felt in informal settlements, where there is no ability to grow food.

Despite the substantial reduction in demand for fresh produce from hotels and restaurants (for example, in Fiji and Vanuatu), the existing supply of fresh produce is not being made available due to local market closures and travel restrictions in Group 1 countries. Fresh food remains available in Samoa and Tonga. A significant increase in farm-gate selling has occurred, resulting in greater food availability in some rural areas. Travel restrictions and reduced logistics have decreased the volume of produce making its way to urban areas and informal settlements.

### *Food price fluctuations*

Food prices have fluctuated in some countries in the region more than others. Prices have both increased and decreased and there is no common pattern. In Fiji, for example, it was reported that the price for a fish had declined from FJ\$45 (A\$29) to FJ\$25 (A\$16). The price of pineapples was also down from FJ\$5 (A\$3) for a heap to FJ\$2.50 (A\$1.50). The Solomon Islands government enacted a policy to prevent price hikes of staples, but prices have still increased. Informants have observed a doubling in price of commodities outside of Honiara. In Malaita, 48% of respondents noticed higher prices for rice and 46% noticed higher prices for canned tuna (Eriksson et al 2020). A key informant confirmed that ‘another challenge has been the ability to sell food at the market, meaning that we are now selling at the farm gate’.

In Samoa it was reported that prices have remained relatively stable for commodities such as coconut (WS\$0.90/A\$0.50 per kg)

and taro (WS\$2.39/A\$1.20 per kg), but were starting to rise. The Government of Samoa has established a parliamentary committee to control food prices. A key informant noted the nutritional risk of price increases, commenting 'if healthy food gets expensive, people will move to imported, less nutritious food'. Prices in Kiribati and Tuvalu were not reported to have varied.

In May 2020, the World Food Programme Regional Pacific Food Security Cluster identified that Tonga was heavily reliant on imported food due to domestic travel restrictions and lockdowns. Acute shortages may occur if food imports are interrupted as a result of limited food reserves (based on estimates of two days' supply). Ongoing transport and logistics will be crucial for long-term food distribution and security in the region.

### *Employment and remittances*

Reduced income from tourism has been a major impact. Recent analysis shows that under a worst-case scenario, where travel bans extend for more than seven months, the estimated total losses from the decline in tourism in selected countries could be up to US\$1.9 billion (A\$2.7 billion) (Farrell et al 2020, SPC 2020a). This is a 90% drop in tourism income. Reduction of tourism also has ongoing impacts for farm incomes, as there is less demand for foods consumed by tourists (for example, herbs).

Analysis by the Fijian Ministry of Employment has shown that from February to June 2020, 115,000 people have become unemployed (Krishant 2020). In addition, it is expected that a further 130,000 informal workers in the economy are likely to be impacted. In Solomon Islands, non-essential government staff have been laid off, and the national stimulus package offered to pay 50% of the salary of displaced government staff for three months.

The reduction in remittances has impacted immediate on household incomes. A number of key informants identified that the COVID-19 crisis has led to a reduction in remittances across the Pacific as a whole. In nations where remittances make up a small proportion of household income (for example, Solomon Islands, Tuvalu, Kiribati) more modest impacts on remittances reduction have been reported. In Fiji, remittances income is expected to reduce by 15% (McClure 2020), eroding the important social protection function that this source of income plays.

### *Rural social cohesion*

There have been reports of increases in theft and land disputes in Group 2 and 3 nations. Conflicts over use of 'idle' land for new plantings have resulted in violence in Samoa, Solomon Islands and Vanuatu. In Vanuatu, the theft of sandalwood trees has been reported as a problem for communities relying on this high-value but slow-growing commodity. In Fiji and Vanuatu, there is already theft of kava, and two key informants noted that theft of root crops, fruits and vegetables has increased since the pandemic started.

### *Vulnerable groups*

#### *Urban poor*

Poverty is likely to increase in the region. Based on a 5% contraction scenario, poverty would increase by 27% in Solomon Islands and 15% in Vanuatu (Hoy 2020). Under a 20% contraction scenario, 1.2 million people in the region would be pushed into extreme poverty. This is an increase of more than 40% on pre-COVID-19 levels (Hoy 2020). Multiple key informants reported that the urban poor have been most affected as a result of a combination of changing food prices, loss of jobs and an inability to take part in the food-growing programs offered by some governments. A report from Suva (Fiji) found that children in 30 informal

and taro (WS\$2.39/A\$1.20 per kg), but were starting to rise. The Government of Samoa has established a parliamentary committee to control food prices. A key informant noted the nutritional risk of price increases, commenting 'if healthy food gets expensive, people will move to imported, less nutritious food'. Prices in Kiribati and Tuvalu were not reported to have varied.

In May 2020, the World Food Programme Regional Pacific Food Security Cluster identified that Tonga was heavily reliant on imported food due to domestic travel restrictions and lockdowns. Acute shortages may occur if food imports are interrupted as a result of limited food reserves (based on estimates of two days' supply). Ongoing transport and logistics will be crucial for long-term food distribution and security in the region.

### *Employment and remittances*

Reduced income from tourism has been a major impact. Recent analysis shows that under a worst-case scenario, where travel bans extend for more than seven months, the estimated total losses from the decline in tourism in selected countries could be up to US\$1.9 billion (A\$2.7 billion) (Farrell et al 2020, SPC 2020a). This is a 90% drop in tourism income. Reduction of tourism also has ongoing impacts for farm incomes, as there is less demand for foods consumed by tourists (for example, herbs).

Analysis by the Fijian Ministry of Employment has shown that from February to June 2020, 115,000 people have become unemployed (Krishant 2020). In addition, it is expected that a further 130,000 informal workers in the economy are likely to be impacted. In Solomon Islands, non-essential government staff have been laid off, and the national stimulus package offered to pay 50% of the salary of displaced government staff for three months.

The reduction in remittances has impacted immediate on household incomes. A number of key informants identified that the COVID-19 crisis has led to a reduction in remittances across the Pacific as a whole. In nations where remittances make up a small proportion of household income (for example, Solomon Islands, Tuvalu, Kiribati) more modest impacts on remittances reduction have been reported. In Fiji, remittances income is expected to reduce by 15% (McClure 2020), eroding the important social protection function that this source of income plays.

### *Rural social cohesion*

There have been reports of increases in theft and land disputes in Group 2 and 3 nations. Conflicts over use of 'idle' land for new plantings have resulted in violence in Samoa, Solomon Islands and Vanuatu. In Vanuatu, the theft of sandalwood trees has been reported as a problem for communities relying on this high-value but slow-growing commodity. In Fiji and Vanuatu, there is already theft of kava, and two key informants noted that theft of root crops, fruits and vegetables has increased since the pandemic started.

### *Vulnerable groups*

#### *Urban poor*

Poverty is likely to increase in the region. Based on a 5% contraction scenario, poverty would increase by 27% in Solomon Islands and 15% in Vanuatu (Hoy 2020). Under a 20% contraction scenario, 1.2 million people in the region would be pushed into extreme poverty. This is an increase of more than 40% on pre-COVID-19 levels (Hoy 2020). Multiple key informants reported that the urban poor have been most affected as a result of a combination of changing food prices, loss of jobs and an inability to take part in the food-growing programs offered by some governments. A report from Suva (Fiji) found that children in 30 informal

settlements were going without meals, as their unemployed parents had lost the capacity to buy food. This was an issue also noted by key informants.

### *Women*

The COVID-19 pandemic has resulted in women taking on additional roles as primary health carers and having increased household food sourcing and preparation responsibilities. Lockdown has also exposed them more to domestic violence (CARE 2020). Lockdowns and movement restrictions have inequitably precluded women from participating in the workforce, particularly fresh food markets. Key informants noted that in major markets and stalls in Solomon Islands, women who would traditionally act as intermediaries between producers and consumers are no longer able to perform this role due to lockdowns and travel restrictions. Their income from these activities has been reduced.

In Tonga and Samoa, interviewees spoke of the economic impact of lockdowns on rural women's weaving opportunities. As one informant noted, 'Most weaving comes from women, done in a group—however because of the social isolation, women cannot come together and weave, so household income is declining. The entire family is being affected... And now that isolation relaxes, it can take a while for business to start again.' The baskets produced by women's weaving activities are often bought by diaspora communities in New Zealand and Australia, who may be facing their own unemployment pressures due to the COVID-19 crisis.

One informant from Solomon Islands discussed the direct impact of the COVID-19 pandemic in terms of the movement of people and the implications for women in rural households: 'When people move back to the village, this creates a burden to the women as they need to feed the Wantoks

and larger families. The women are the ones that produce and collect the food to feed the families. The women end up eating less because there are more families in the village—women are the ones that will eat last, they will feed visitors and the family first.'

There have also been reports of increased domestic violence against women. This issue is also reported in the Papua New Guinea assessment. Gender-based violence against women in the Pacific is among the highest in the world, with 60–80% of women aged 15–49 years experiencing some sort of partner violence in their life (CARE 2020). One key informant from Fiji noted civil society organisations have seen a 200% increase in reports of domestic violence, as well as additional reports of unwanted pregnancies (Narayan 2020).

### *Youth*

The COVID-19 pandemic has exacerbated a long-term economic challenge of high rates of unemployment among young people. This is most noticeable in Group 3 countries, which have young populations. The Pacific has a very young population, with over 50% of the population under the age of 25 (SPC 2014), and the COVID-19 crisis has reduced their ability to physically attend school or hands-on vocational training opportunities. The flow-on impacts of lack of opportunities for youth can have long-term economic and social stability impacts in the region (Wilson 2020). There are risks of the COVID-19 pandemic exacerbating problems of youth employment in informal sectors, which can have unsafe working conditions, low wages and minimal employment prospects in the long term.

## **5.4.4 Recovery and resilience**

This section is organised around four recovery and three resilience themes related to the COVID-19 crisis and Tropical Cyclone Harold shocks since March 2020.

The four recovery themes are:

1. Innovative social protection programs: Agriculture and food security strategies are being promoted through different formal and informal systems.
2. Flexibility in food markets and marketing: Marketing of products has continued and taken different forms, notably e-commerce. Women have played an important role in linking products with consumers.
3. Continuous food logistics and balancing short supply chains with food imports: Local supply chains have played a crucial role in enabling food access. Ongoing transport logistics have enabled food imports to continue, which is critical for food availability in import-dependent nations.
4. New modes of disaster preparedness: The combined experience of Tropical Cyclone Harold and COVID-19 has demonstrated the importance of using existing disaster preparedness for planning for future shocks.

The three resilience themes are:

1. Livelihoods and food system shocks: Resilience of livelihoods is determined by the underlying factors that create or inhibit buffers for future shocks. Future shocks include extreme weather events and health associated shocks, as well as ongoing stresses such as climate change and increases in non-communicable diseases. Current food systems need to be plan for these near-term and long-term shocks.
2. Adaptive capacity of Pacific food systems: The adaptive capacity of food systems is affected by a combination of biophysical contexts, and the knowledge and social capital of different groups. Combining existing farmer and fishers' knowledge with new interventions in the food production sector can help advance context-specific adaptive capacities.

3. Coordinated focus on food and nutrition security: Knowledge sharing has been good and information updates have been frequent since the onset of the COVID-19 crisis. Further strengthening of regional governance that links health and production sectors on an ongoing basis and advances food systems approaches to policies and programs can support resilience.

### *Innovative social protection programs*

On average, Pacific island countries spend less than 1% of their gross domestic product on formal social protection systems (World Bank 2018). While some limited social protection was documented in Solomon Islands and Tuvalu, wider social protection activities have focused on seed distribution and farming, enabled both by governments and community groups, which have supported recovery.

### *Agriculture*

A focus on agriculture has been a core recovery strategy, both in formal policy and in communities. Key informants agreed that enhancing both production and maturity of agriculture and fisheries value chains represents an effective recovery exercise, particularly in Group 1 and 2 countries.

One example of this type of innovation can be found in Solomon Islands, where the government contracted Sape Farmers Group to cultivate cassava on 40 ha of land for domestic markets, using community labour from nearby villages. The farmers are not only paid for their labour but are trained in new planting techniques and practices.

More direct approaches to encourage greater agricultural production have been undertaken through the provision of seeds and planting material, with reports of successful adoption of the practices in Vanuatu, Fiji, Samoa, Tonga and Tuvalu. In Fiji, one informant noted that 'there is a re-emergence of *Solesolevaki*—the idea of



working together. For example, if you have land, we as neighbours work on it one day, then we work on mine, and so on. This is particularly good for the city people now coming into agriculture.’

A response common to all countries in this assessment was the surge in home gardening in urban and peri-urban settings. This has been supported by training activities run by government and non-government organisations, for example, the training of 100 people supported by the South Pacific Regional Environmental Program in June 2020 (Radio New Zealand 2020). This upswing in urban and peri-urban home gardening may support healthier eating at home, particularly through the consumption of fresh vegetables. This aligns with multiple initiatives across the Pacific that support healthy eating.

#### *Inclusion of vulnerable groups*

Formal social protection systems for agriculture may exclude some vulnerable groups. The urban poor, notably those in informal settlements, will probably face the twin challenges of no access to land for agriculture and lack of safety nets. In rural communities, it remains unclear who will benefit from the current stimulus packages and agricultural support systems being rolled out in the region. Issues of land access and class may prevent some rural people from accessing these benefits, which risks perpetuating poverty and inequality. This may have further unintended impacts on women and youth, who may not be able to access the services and stimulus available for the agriculture sector. If formal systems only target farming, those that depend on non-farm livelihoods may also miss out.

There may be a role for cash-based social protection schemes directed at these vulnerable groups, to complement the agriculture-focused schemes. There is evidence from Fiji’s approach following Cyclone Winston in 2015 that recipients

of welfare payments are more likely to recover from shocks, as they are more likely to recover from sickness, replenish food stocks, remediate their land or rebuild dwellings (Mansur et al 2018).

#### *Utilisation of local skills and knowledge*

The Pacific has a history of strong social capital and knowledge exchange between communities, and recovery efforts in the region have drawn on these existing strengths. Donors and governments can play a critical role in addressing resource limitations (for example, planting materials), while leveraging the multiple initiatives of farmer organisations, businesses and governments to support agricultural recovery through using existing skills and capacities. This approach shifts the pervasive narrative of the region as ‘lacking and missing’ (Barnett 2020) to one of having existing capacities and knowledges that can be used and strengthened to improve food system functionality.

#### *Leverage the skills and capacities of women and youth*

The skills and capacities of women and youth can be leveraged as a recovery strategy. While these groups may face greater disadvantages due to a mix of sociocultural and structural factors, they also play important roles in society and in the current and potential labour force. In Vanuatu, a recent study found that after Tropical Cyclone Pam in 2015, women market vendors played a critical role as capital mobilisers, leaders, innovators and entrepreneurs, despite operating within a gendered and inequitable structure (Clissold et al 2020). Programs such as Youth@Work in Solomon Islands have engaged over 1,000 young professionally-trained agriculturalists to train and mentor youth to establish food businesses. This has improved youth employment in a range of enterprises across the food system—not only growing food—and represents



an approach to enhance production but include marginalised members of the Pacific community.

### *Flexibility in food markets and marketing*

#### *Food availability*

Despite the closure of some markets due to lockdowns, food availability in the region has generally not suffered. This is due to alternative distribution approaches being implemented, including new e-commerce tools. The redirection of food intended for export or tourism enterprises also led to a sharp decline in demand.

Access to available food was also supported by various public policies. In Solomon Islands and Samoa, restrictions on food prices to prevent price gouging allowed people to buy food at reasonable prices. In Vanuatu, the COVID-19 Food Security Response Plan supported commercial food baskets, where produce from farmers was packaged for urban citizens at affordable prices. In Tonga, the reduction in remittances has seen an emergence of new food businesses that are attempting to replace lost remittance income. One informant noted that approximately 16 new food outlets in Tonga are waiting to open.

#### *E-commerce*

E-commerce has increased and played a role in recovery. In Fiji and Solomon Islands, Facebook and WhatsApp markets and bartering systems have gained in popularity. In Fiji, the Barter for Better Fiji group established in April 2020 now has over 180,000 members. While not food-specific, the group has enabled non-cash-based product exchanges during the lockdowns. Similarly, in Solomon Islands, produce that is usually sold to hotels and not typically eaten by local communities, like herbs, were sold on Facebook. These web-based technologies can play useful roles in food systems shocks by continuing the marketing of food.

#### *Food marketing by women*

In the Pacific, 75–90% of market vendors are women (UN Women 2016). Women have continued to market food throughout the pandemic, underlining their crucial role in value chains. A key informant highlighted Fijian women's entrepreneurial capacities: 'The women in Fiji's fisheries are now semi-commercial, they are now working directly in markets and selling their produce. Women have also learned to bargain and supply directly to buyers—you can tell they are more involved in the value chain... Women are engaging with the market with skills they had before COVID-19.' Women are crucial in linking food production with consumers, and continue to demonstrate strong leadership during times of disaster (Clissold et al 2020).

### *Continuous food logistics and balancing short supply chains with food imports*

Short value chains within countries have enabled the flow of fresh food in the Group 2 and 3 countries. Continuation of shipping has allowed the flow of food to Group 1 countries. This demonstrates the importance of balancing domestic and regional value chains with international imports. The different production potential throughout the region for fresh foods makes short and efficient supply chains important in times of a shock, as they allow food to be distributed internally. Imported foods can provide useful buffers in time of disaster, as long as prices remain stable. Local fresh food can be distributed further with improved regional trade and domestic supply networks.

Short value chains can allow urban populations to have access to nutritious food, and rural populations to generate incomes while also having access to nutritious food. The relatively short distances between rural areas and big cities in the countries assessed made food distribution manageable even during lockdowns. For example, when Lautoka (Fiji)

went into lockdown in March 2020, there were reports of organised procurement of food from farmers in the area to Suva and Nadi to maintain cash flow. Transport logistics in these short value chains made food distribution throughout the country possible. There were reports in Fiji and Solomon Islands of communities organising themselves to reduce the number of people travelling to get food to markets. A key informant from Fiji noted that ‘traditional networking systems have managed to reduce the value-chain costs—the communities have established their own value-chain systems’. Ultimately, recovery during and after a shock in the Pacific will be dependent on a combination of short value chains and regional trade, but also adequate price control and distribution of imported foods.

### *New modes of disaster preparedness*

The experience in the region of planning for and working within a disaster context provides useful skills for future food system shocks. There is already existing knowledge in disaster planning, emergency information sharing and preparing communities for extreme weather event shocks. This knowledge can be adapted to prepare for other food system shocks.

Pacific island communities have accumulated significant experience in managing extreme climatic shocks. There have been extensive efforts by national governments, non-government organisations, donors and the private sector to build preparedness capacities for managing extreme weather events. This knowledge and experience can help manage other disruptions. For example, despite Vanuatu’s high exposure to natural disasters, they are leading the way in integrated adaptation planning and disaster risk reduction across different scales (Hayward et al 2020). Preparedness strategies are driven by a mix of scientific

evidence, and local values and ways of working. Learning from these experiences can support future preparedness.

### *Livelihoods and food system shocks*

Rural livelihoods are dependent on a combination of contextual environmental and social conditions. In the Pacific, rural livelihoods are affected by immediate shocks (for example, COVID-19 or rhinoceros beetle), as well as shocks and stresses caused by pre-existing exposures (for example, extreme weather events or high rates of obesity). This means that planning for future resilience requires interventions that address both the impacts of current shocks as well as the underlying factors that will affect the future of the system. Underlying resilience can lessen the impact of those shocks. For example, strong innovative social protection that supports diverse livelihoods can create economic buffers. Upcoming shocks from climate extremes, such as inevitable cyclones, can be addressed now by designing climate-smart agricultural strategies to boost resilience. Strategies that create a healthier population can build resilience to the shock on health systems of increased diseases.

### *Adaptive capacity of Pacific food systems*

Long-term resilience comes from a combination of the immediate responses provided by donors and governments, the detailed knowledge that farmers and rural communities hold about their food systems and the strong social capital and adaptive capacity within communities.

Interventions for food security can support the production of food as well as the other pillars of food security (access and utilisation). Interventions can also support the development of value chains that can adapt to sudden shocks. For example, as discussed earlier, the urban poor are particularly vulnerable due to their high

dependence on incomes for food security. At the onset of the COVID-19 pandemic, the response of the Solomon Islands government showed strong adaptive capacity by enforcing food price limits that protected the urban poor from price gouging. Kiribati and Tuvalu have more limited adaptive capacity, due to their dependence on international food imports. The key recovery initiatives in Tuvalu are providing seedlings and supporting rapid gardening strategies. Landowners are encouraged to practice customary stockpiling techniques to create food buffers. Fisheries provide a strong buffer to food security in Group 1 countries, in light of their low adaptive capacity in agriculture.

An immediate challenge to supporting adaptive capacity during and after the COVID-19 crisis will be preparing already economically affected countries for future potential shocks, notably extreme weather events and the ongoing challenges of pest and disease, which continue to affect food systems.

### *Coordinated focus on food and nutrition security*

#### *Food and nutrition security policy*

The COVID-19 pandemic has highlighted the importance of food and nutrition security as a crucial development and policy objective for the region. This can be seen in the rapid focus on subsidising and supporting agricultural production. This commitment to supporting agricultural livelihoods, coupled with a regional focus on healthy diets, creates an opportunity to support food system resilience through coordinated measures.

The interviews conducted as part of this assessment emphasised the role that different sectors and groups play in regional food security. National governments support agriculture through extension services, subsidies and the allocation of

national budgets to agricultural recovery. Farmer organisations (for example, Rural Integrated Enterprises & Development in Fiji, Kastom Garden Association in Solomon Islands, Mainstreaming of Rural Development Innovation Tonga Trust, the Samoa Farmers Association and the Farmer Support Association in Vanuatu) provide peer-to-peer learning opportunities and training that support immediate farmer needs. Other non-government groups, such as Malaita Youth in Business, enable youth participation in food marketing through innovative technologies, such as phone apps and web-based markets, that youth are familiar with, and lead their implementation.

#### *Agricultural extension*

Agricultural extension and support can be diversified beyond the public sector. Innovative opportunities can arise for the private sector and non-government farmer organisations to support extension or enable farmer-to-farmer knowledge exchange. At a regional level, multilateral agencies like the Pacific Community continue to provide technical services to governments. During the COVID-19 crisis, these agencies have been essential in the area of seed distribution and seed saving.

#### *Regional institutions*

Regional institutions can use their expertise and experience to support agricultural recovery and wider food systems leadership. For example, the Pacific Community has provided support to national governments for more than 70 years, drawing on its strengths in food systems across multiple disciplines and sectors. The Pacific Community has increasingly taken a systems approach to tackling issues of food security in the region. The University of the South Pacific also has substantial experience working across different food systems, and their research and knowledge can add value to novel policy directions in food security.

dependence on incomes for food security. At the onset of the COVID-19 pandemic, the response of the Solomon Islands government showed strong adaptive capacity by enforcing food price limits that protected the urban poor from price gouging. Kiribati and Tuvalu have more limited adaptive capacity, due to their dependence on international food imports. The key recovery initiatives in Tuvalu are providing seedlings and supporting rapid gardening strategies. Landowners are encouraged to practice customary stockpiling techniques to create food buffers. Fisheries provide a strong buffer to food security in Group 1 countries, in light of their low adaptive capacity in agriculture.

An immediate challenge to supporting adaptive capacity during and after the COVID-19 crisis will be preparing already economically affected countries for future potential shocks, notably extreme weather events and the ongoing challenges of pest and disease, which continue to affect food systems.

### *Coordinated focus on food and nutrition security*

#### *Food and nutrition security policy*

The COVID-19 pandemic has highlighted the importance of food and nutrition security as a crucial development and policy objective for the region. This can be seen in the rapid focus on subsidising and supporting agricultural production. This commitment to supporting agricultural livelihoods, coupled with a regional focus on healthy diets, creates an opportunity to support food system resilience through coordinated measures.

The interviews conducted as part of this assessment emphasised the role that different sectors and groups play in regional food security. National governments support agriculture through extension services, subsidies and the allocation of

national budgets to agricultural recovery. Farmer organisations (for example, Rural Integrated Enterprises & Development in Fiji, Kastom Garden Association in Solomon Islands, Mainstreaming of Rural Development Innovation Tonga Trust, the Samoa Farmers Association and the Farmer Support Association in Vanuatu) provide peer-to-peer learning opportunities and training that support immediate farmer needs. Other non-government groups, such as Malaita Youth in Business, enable youth participation in food marketing through innovative technologies, such as phone apps and web-based markets, that youth are familiar with, and lead their implementation.

#### *Agricultural extension*

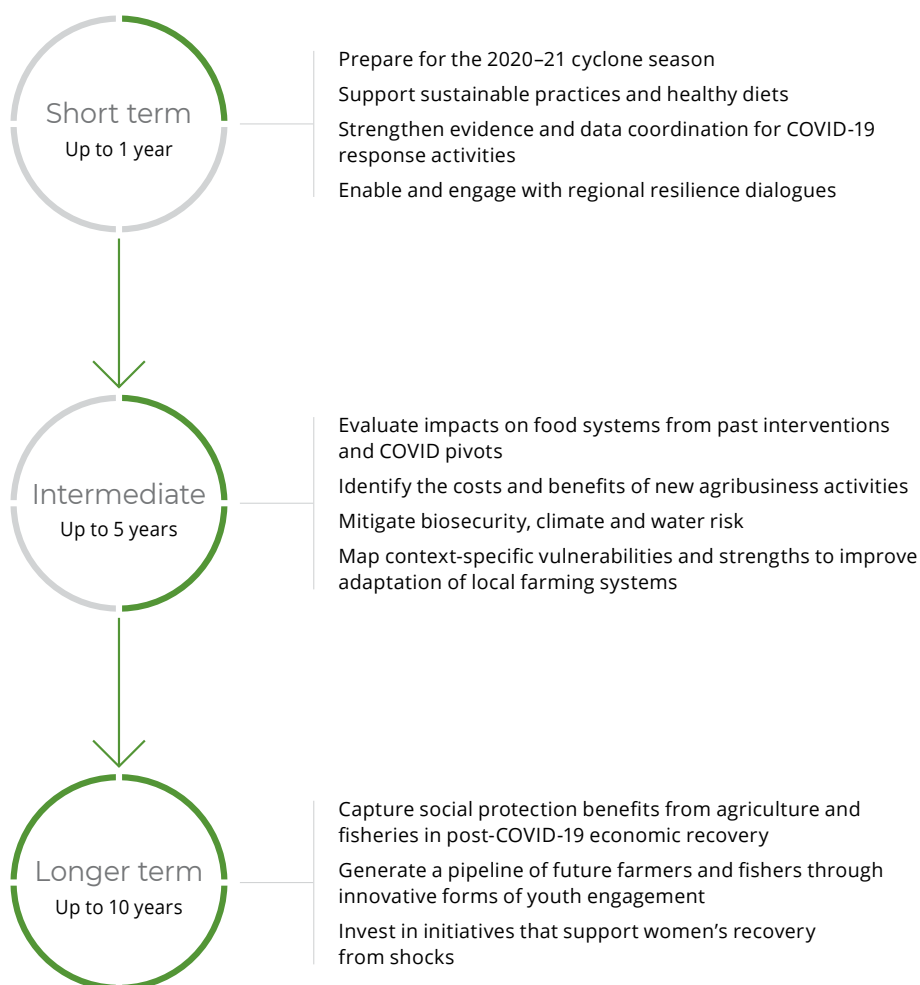
Agricultural extension and support can be diversified beyond the public sector. Innovative opportunities can arise for the private sector and non-government farmer organisations to support extension or enable farmer-to-farmer knowledge exchange. At a regional level, multilateral agencies like the Pacific Community continue to provide technical services to governments. During the COVID-19 crisis, these agencies have been essential in the area of seed distribution and seed saving.

#### *Regional institutions*

Regional institutions can use their expertise and experience to support agricultural recovery and wider food systems leadership. For example, the Pacific Community has provided support to national governments for more than 70 years, drawing on its strengths in food systems across multiple disciplines and sectors. The Pacific Community has increasingly taken a systems approach to tackling issues of food security in the region. The University of the South Pacific also has substantial experience working across different food systems, and their research and knowledge can add value to novel policy directions in food security.

## 5.5 Opportunities for action

### 5.5.1 Snapshot of potential investment options



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

#### *Prepare for the 2020–21 cyclone season*

The amplification of food insecurity was most felt in areas affected by Tropical Cyclone Harold, and by urban people who have lost their incomes. Immediate measures need to build future food buffers, for example, through mixed planting and storage strategies. This needs to be done in light of potential severe cyclones in the 2020–21 season.

- Example policy measure: Supplement production in cash commodity systems (which generate income) with fast-growing foods (for self-consumption or local markets). Work with existing humanitarian or food trade/supply corridors to prepare for upcoming cyclone shocks.
- Example research focus: Use existing research infrastructure and knowledge to support seed conservation and distribution, intercropping and climate-smart farming.

#### *Support sustainable practices and healthy diets*

This assessment has noted the focus on home gardens, farming and stimulation of the food production sector as a recovery strategy. Increased rural populations and the resurgence of interest in agricultural livelihoods is an opportunity to support governments, non-government organisations and communities to embed sustainable farming practices in these new production systems. This may include low-cost opportunities for composting and recycling farm resources to support agriculture in nutrient-poor islands. This also creates an opportunity to use existing healthy eating guidelines to encourage practice change. Small actions to showcase linkages between agricultural production and adopting healthier diets can help

address the major underlying exposure of pre-existing health challenges.

- Example policy measure: Incorporate sustainable farming strategies (which can be based on past work done by the University of the South Pacific, Pacific Community, ACIAR, Australian Department of Foreign Affairs and Trade, etc) into new incentives to grow food. Home gardening can also provide an opportunity to create low-cost composting and water saving systems.
- Example research focus: Understand links between new agricultural activities and changes in food consumption patterns, and if the type of food available in local markets is changing and how.

#### *Strengthen evidence and data coordination for COVID-19 response activities*

There has been significant support for knowledge and information sharing through the World Food Programme Pacific Food Security Cluster. This group is reporting on assessments concluding in the third quarter of 2020. The substantial data collected this year need to be tailored to different governments and multilateral agencies to support their recovery strategies. Identifying and supporting a neutral group or broker to manage this emerging data could help this process.

- Example policy measure: Leverage existing partnerships to continue and improve the data and knowledge sharing that has taken place during the COVID-19 recovery period, ideally through open-data systems. Use the data and evidence that emerges to support bilateral and multilateral partners.
- Example research focus: Understand how the emerging data on COVID-19 food system impacts can be used to increase evidence-based decision-making by governments, non-government

organisations, businesses and communities.

### *Enable and engage with regional resilience dialogues*

The Pacific Week of Agriculture offers an important opportunity for multiple agencies in the region to share experiences and advance policies and strategies for agricultural development. If it goes ahead, the 2021 Pacific Week of Agriculture could be a forum to organise and advance resilience and food systems approaches that have agriculture at the core but link with broader exposure issues discussed in this assessment. The Pacific Community has strong links with governments, and is well positioned to broker technical food systems interventions emerging from these discussions with governments.

- Example policy measure: Identify bilateral and multilateral programs and strategies that seek to take a systems approach to food, and use this as an opportunity to help advance resilience-informed policy.
- Example research focus: Broker a food systems research session during the 2021 Pacific Week of Agriculture that draws from the multiple exposures and impacts to identify new research priorities.

## **5.5.3 Intermediate term (up to 5 years)**

### *Evaluate impacts on food systems from past interventions and COVID pivots*

The COVID-19 pandemic has presented opportunities to support new food and nutrition security measures by showcasing what has worked and what has not across different food and fish production systems. This can be done by learning from the substantial number of programs, projects and research that have attempted to address one or multiple parts of the food system. There are two scales to this. The

first is context-specific—understanding how food systems and livelihoods have changed because of past interventions and more recent COVID pivots. The second is a more systems-level evaluation. While this is potentially more complex, in light of large data uncertainties, it is important to understand how previous research and regional programs have helped advance food systems resilience across the region as a whole.

- Example policy measure: Identify from previous evaluations and reviews what contributions have been made to resilience, and whether these have been sustained.
- Example research focus: Investigate how long-term investments into particular farming and fishing practices and technologies have supported food and nutrition security, and determine how past interventions have coped with previous shocks and disruption (for example, cyclones) to understand the resilience of research activities.

### *Identify the costs and benefits of new agribusiness activities*

New agribusiness activities will emerge in response to the COVID-19 crisis, including in those countries where remittances have declined. Opportunities exist for current and new businesses to value add and/or substitute products, including replacing imported products with local ones. The substitution of imported wheat and cooking oil with local produce are two prospective options. The costs and benefits of new ventures in value adding and/or substitution need to be thoroughly understood. In addition to food production, it is vital to consider the extent to which such a venture might generate employment and associated support services. For example, a new digital extension service could leverage future employment by engaging with youth



vocational training programs during its development and application.

- Example policy measure: Use existing market and value-chain projects to stimulate new businesses emerging in response to the lockdown. Support the linking of primary food producers with entrepreneurial activities.
- Example research focus: Determine how youth can be engaged in food sector employment that is not necessarily farming, including innovative food businesses. Analyse the economic returns of import substitution of selected products.

#### *Mitigate biosecurity, climate and water risk*

An ongoing focus on the pressing biological and ecosystem exposures in the region is important. Biosecurity control of current and potential threats (such as African swine fever) is critical for food security. The inter-related impacts of water scarcity and extreme climate changes provide an opportunity to identify climate-resilient farming strategies.

- Example policy measure: Work with existing biosecurity frameworks and policies and support biosecurity control using the existing capacities in the region.
- Example research focus: Identify gaps in knowledge of current and emerging biosecurity risks. Investigate country-specific climate-resilient varieties that are socially acceptable and nutritious. Understand water use practices in agriculture and the potential of water conservation technologies.

#### *Map context-specific vulnerabilities and strengths to improve adaptation of local farming systems*

It is important to understand the areas in the system that can support or inhibit future resilience. To date, there are

limited studies, data sets and analysis of the different Pacific food systems.

Understanding how communities, governments and different food systems have recovered after previous shocks would be an important evidence base for planning future measures.

- Example policy measure: Enable policy dialogues and alignment with bilateral and regional agencies aiming to support food systems. Identify policy systems that have demonstrated the ability to enable resilience.
- Example research focus: Synthesise how production and prices changed in light of the COVID-19 crisis and understand which commodity sectors and groups are most affected.

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

##### *Capture social protection benefits from agriculture and fisheries in post-COVID-19 economic recovery*

Agriculture and fishing have been effective forms of social protection for Pacific island communities during the COVID-19 pandemic. The scope for agriculture and fisheries to play a stronger role and make a more expansive contribution to social protection should be considered by Pacific island countries, individually and collectively, in post-COVID-19 economic recovery planning and implementation.

- Example policy measure: Strengthen existing farming and fishing supply stimulus activities that support the generation of producer incomes.
- Example of research focus: Identify how existing agricultural and fisheries policies in Pacific island countries might better deliver social protection outcomes.



### *Generate a pipeline of future farmers and fishers through innovative forms of youth engagement*

Agriculture and fisheries continue to play an important role in the economy, but the reality is that much of this work is done by an ageing group of farmers and fishers. The high number of youth in the region provides an opportunity to create new ways of growing food and supporting new types of employment. This will require better understanding of social barriers to youth engagement in agriculture and fishing. Scholarships, training and vocational programs all offer long-term opportunities for strengthening the food sector.

- Example policy measure: Design and implement long-term programs that link youth with businesses in the food sector. In doing so, establish the most effective ways of engaging rural and urban youth based on local evidence.
- Example research focus: Understand the social determinants of increasing youth participation in the food sector. Determine how diets can be improved by creating healthier food environments in different places (for example, churches, schools, meetings).

### *Invest in initiatives that support women's recovery from shocks*

An increased focus on agriculture as a recovery tool must not come at the cost of women's wellbeing. Women play critical roles in the production, marketing and food preparation components of the food system, but they face multiple structural barriers. Any measures need to be sensitive to gender implications and focus on strengths-based partnerships with the women involved in order to critically examine how the project intersects with underlying gender norms.

- Example policy measure: Advance women-led market opportunities and

understand the gender implications of agricultural recovery plans.

- Example research focus: Support research led by local experts in the Pacific to address data gaps on women's contributions to fisheries and agriculture and use this to inform policies.

## 5.6 Conclusions

So far, the impacts of the COVID-19 pandemic on food systems in the Pacific have been:

- reduction of international tourists and subsequent reduction in income
- reduction in remittances (mostly in Tonga and Samoa)
- loss of employment in urban informal settlements and subsequent migration to rural areas
- increased pressures on rural women
- limited ability to market produce due to lockdowns and loss of freight
- limited farming supplies to boost production.

These impacts have had a multiplier effect on vulnerable groups, such as the urban poor or unemployed youth, and on communities that were affected by Tropical Cyclone Harold in April 2020. The Pacific has benefited from relatively stable global food supply, given the relative stability of international imports; however, this may create risks for high import-dependent countries in Group 1 and 2 if transport and logistics cease. The economic ramifications of COVID-19 may trigger further poverty in the region, amplifying food insecurity. Given the crucial role that agriculture and fisheries play in Pacific national and rural economies, building the adaptive capacity of this sector to manage the current and inevitable future shocks, such as cyclones, is critical.

Recovery in the food system has come from:

- strategies to augment domestic food production
- the agility of markets and marketing
- stability in food logistics
- learning from existing disaster preparedness.

Throughout the region, there has been substantial interest in agricultural stimulus and planning for food security in light of the COVID-19 crisis. The increased interest in home gardening and a focus on agriculture as an economic recovery strategy can provide immediate opportunities for the supply of essential fresh foods in the region, and support healthy eating practices.

However, it remains unclear if there will be sufficient adoption of these agricultural practices in the long term, especially for those new to farming and working on previously 'idle' land.

The elevated status of food and nutrition security in post-COVID-19 national strategies provides an opportunity to support new ways of farming that focus on sustainable practices and include women and youth. This could create more long-term diversification of people farming in the region. The region has demonstrated the ability to quickly develop new ways of marketing, such as self-organising food distribution systems and the emergence of e-commerce. The immediate future of food systems in the region will need to ensure that agricultural recovery strategies are also linked to equitable economic development. This is an opportunity to address underlying inequalities and use agriculture as an inclusive economic recovery strategy.

Strategies to build resilience in Pacific food systems must take into account current and underlying exposures, notably climate change and poverty. This means supporting the existing capacities of food systems and enhancing their adaptive capacities

across different contexts. Coordinated measures are needed that work not just with agriculture and fisheries sectors but also engage with organisations focused on youth, health and gender issues, and include non-government organisations and the private sector. The Pacific has multiple private and non-government groups that work with farmers to increase production, distribute food to markets, enable knowledge exchange and create opportunities for women and youth. These largely social determinants of resilience, coupled with increasing sustainable resource management and biosecurity controls, can support adaptive capacities throughout the region.

Short-term measures can leverage the current interest in agriculture to support food security. These opportunities for action emphasise the need to build food production buffers in light of upcoming cyclone seasons, find new resource recovery systems for farming inputs such as compost, and embed healthy eating and learning from COVID-19 crisis assessments into ongoing practices and policies.

Intermediate-term investment opportunities could better enable regional food systems coordination beyond primary food production. These measures should examine the systemic impacts of previous food research and projects, create novel business innovations from existing products, enable food systems dialogue at regional forums such as the Pacific Week of Agriculture to support regional food systems capacities, and better understand the most vulnerable food systems in the region.

Longer-term measures could tackle the underlying determinants of future food systems exposures. This means focusing on the future labour force in food systems, removing structural barriers to women's participation in formal employment in food

systems, reducing unintended burdens from new food system interventions, and creating food-based social protection systems.

Existing knowledge and capacities in the region provide a strong basis for interventions and additional research to support the management of future food system shocks and the building of long-term resilience. ACIAR's historical research provides a solid platform for understanding the underlying biophysical and economic structures of Pacific food systems. These strengths should be complemented by a broader systems understanding of the sociocultural factors that intersect with biophysical exposures. Future research into food systems in the region should maintain a focus on the biosecurity, agronomic and fish needs of the region. It must also support critical food systems governance at multiple scales and with different bilateral and multilateral agencies, as well as synthesising food security successes and failures from a food systems perspective. This can help support the development and implementation of policies and measures based on context-specific evidence to best ensure food systems security and resilience in the Pacific islands.

## 5.7 Acknowledgments

Thank you to Florence Rahiria from ACIAR for the ongoing support and reviews throughout the project. Thank you to the participants who contributed various sources of information. The regional Pacific Food Security Cluster provided a productive community for listening and sharing information, and I thank all those supporting food security in the region. Thank you for the technical reviews from Mike Bourke, Ryan Edwards, Liana Williams, Peter Warr, Robyn Alders, Miranda Forsyth, Michaela Cosijn and Fiona Lynn, which substantially improved the report.

## 5.8 References

- ADB (Asian Development Bank) (2017). *Country partnership strategy: Fiji 2014-2018 poverty analysis*, ADB, Manila.
- Alexandra S, Jamora N, Smale M & Ghanem ME (2020). The tale of taro leaf blight: a global effort to safeguard the genetic diversity of taro in the Pacific. *Food Security* 2020, doi:10.1007/s12571-020-01039-6.
- Andrew NL, Bright P, de la Rua L, Teoh SJ & Vickers M (2019). Coastal proximity of populations in 22 Pacific island countries and territories. *PLOS ONE* 14(9): e0223249.
- Barclay K & Cartwright I (2007). *Capturing wealth from tuna case studies from the Pacific*, Asia-Pacific Press, Canberra.
- Barnett J (2011). Dangerous climate change in the Pacific islands: food production and food security. *Regional Environmental Change* 11(1):229–237.
- Barnett J (2020). Global environmental change II: political economies of vulnerability to climate change. *Progress in Human Geography* 44(6):1172–1118, doi:10.1177/0309132519898254.
- Bell J & Taylor M (2015). *Building climate-resilient food systems for Pacific islands*, WorldFish, Malaysia.
- Bell JD, Taylor M, Amos M & Andrew N (2016). *Climate change and Pacific island food systems*, CCAFS & CTA, Copenhagen, Denmark, and Wageningen.
- Bell JD, Kronen M, Vunisea A, Nash WU, Keeble G, Demmke A, Pontifex S & Andréfouët S (2009). Planning the use of fish for food security in the Pacific. *Marine Policy* 33(1):64–76.
- Béné C (2020). Resilience of local food systems and links to food security—A review of some important concepts in the context of COVID-19 and other shocks. *Food Security* 12:805–822, doi:10.1007/s12571-020-01076-1.
- Bündnis Entwicklung Hilft (2017). *WorldRiskReport*, Bündnis Entwicklung Hilft, Berlin, accessed 10 July 2020, [http://weltrisikobericht.de/wp-content/uploads/2017/11/WRR\\_2017\\_E2.pdf](http://weltrisikobericht.de/wp-content/uploads/2017/11/WRR_2017_E2.pdf).
- Campbell JR (2015). Development, global change and traditional food security in Pacific island countries. *Regional Environmental Change* 15(7):1313–1324.
- CARE (2020). *Rapid gender analysis of COVID-19 Pacific Region*, CARE International, Melbourne.
- CBSI (Central Bank of Solomon Islands) (2007). *2007 Annual Report*, CBSI, [www.cbsi.com.sb/publications/annual-report/](http://www.cbsi.com.sb/publications/annual-report/).
- Chand S & Yala C (2008). Informal land systems within urban settlements in Honiara and Port Moresby. *Making Land Work* 2:85–106.
- Charlton KE, Russell J, Gorman E, Hanich Q, Delisle A, Campbell B & Bell J (2016). Fish, food security and health in Pacific island countries and territories: a systematic literature review. *BMC Public Health* 16(1):285.
- Clissold R, Westoby R & McNamara KE (2020). Women as recovery enablers in the face of disasters in Vanuatu. *Geoforum* 113:101–110, doi:10.1016/j.geoforum.2020.05.003.
- Connell J (2015). Food security in the island Pacific: Is Micronesia as far away as ever? *Regional Environmental Change* 15(7):1299–1311.
- COVID-19 Gender Working Group (2020). *Gendered impacts of COVID-19 on women in Fiji*, DIVA, FWRM, MCO, ADB, MWCPA, Suva, <https://static1.squarespace.com/static/536c4ee8e4b0b60bc6ca7c74/t/5ebd9dcbc948f2507a496a39/1589485021543/FinalGender+and+COVID+Guidance+Note+-+Rapid+Gender+Analysis%5B1%5D.pdf> (tinyurl.com/y2nd4zjy).
- Cvitanovic C, Crimp S, Fleming A, Bell J, Howden M, Hobday AJ, Taylor M & Cunningham R (2016). Linking adaptation science to action to build food secure Pacific island communities. *Climate Risk Management* 11:53–62.

- Edwards R (2020). Bubble in, bubble out: lessons for the COVID-19 recovery and future crises from the Pacific. *World Development* 135:105072, doi:10.1016/j.worlddev.2020.105072.
- Eriksson H, Ride A, Boso D, Sukulu M, Batalofo M, Siota F & Gomese C (2020). *Changes and adaptations in village food systems in Solomon Islands: a rapid appraisal during the early stages of the COVID-19 pandemic*, WorldFish, Malaysia.
- FAO (Food and Agriculture Organization of the United Nations) (2000). *2000 World Census of Agriculture*, FAO, Rome.
- FAO (Food and Agriculture Organization of the United Nations) (2010). *Asia and Pacific Commission on Agricultural Statistics*, Food and Agriculture Organization, accessed 9 July 2020, [www.fao.org/economic/ess/ess-events/ess-apcas/ess-apcas23/en/](http://www.fao.org/economic/ess/ess-events/ess-apcas/ess-apcas23/en/).
- FAO (Food and Agriculture Organization of the United Nations) (2011). *FAOSTAT*, FAO, Rome, accessed 2 July 2020, <http://faostat.fao.org/site/342/default.aspx>.
- FAO (Food and Agriculture Organization of the United Nations) (2020a). FAO data, accessed 10 July 2020, [www.fao.org/faostat/en/](http://www.fao.org/faostat/en/).
- FAO (Food and Agriculture Organization of the United Nations) (2020b). *FAOSTAT Country Profiles*, FAO, accessed 2 July 2020, [www.fao.org/faostat/en/#country/155](http://www.fao.org/faostat/en/#country/155).
- FAO (Food and Agriculture Organization of the United Nations) (2020c). *Gendered impacts of COVID-19 and equitable policy responses in agriculture, food security and nutrition*, FAO, Rome.
- FAO (Food and Agriculture Organization of the United Nations) (2020d). *Impacts of COVID-19 on the food systems in the Pacific small island developing states (PSIDS1) and a look into the PSIDS responses*, FAO, Rome.
- FAO (Food and Agriculture Organization of the United Nations) (2020e). *The Pacific islands: Tropical Cyclone Harold*, FAO, accessed 12 July 2020, [www.fao.org/fileadmin/user\\_upload/emergencies/docs/Sit%20Rep\\_Cylone%20Harold\\_6May2020.pdf](http://www.fao.org/fileadmin/user_upload/emergencies/docs/Sit%20Rep_Cylone%20Harold_6May2020.pdf).
- Farrell P, Thow AM, Wate JT, Nonga N, Vatucawaqa P, Brewer T, Sharp MK, Farmery A, Trevena H, Reeve E, Eriksson H, Gonzalez I, Mulcahy G, Eurich JG & Andrew NL (2020). COVID-19 and Pacific food system resilience: opportunities to build a robust response. *Food Security* 12:783–791, doi:10.1007/s12571-020-01087-y.
- Gillett R (2016). *Fisheries in the economies of Pacific island countries and territories*, SPC, Noumea.
- Gillett R & Tuati M (2018). *Fisheries of the Pacific islands: regional and national information*, FAO, Rome.
- Global Nutrition Report (2020). *Country Nutrition profiles*, Global Nutrition Report, accessed 10 July 2020, <https://globalnutritionreport.org/resources/nutrition-profiles/>.
- Gnecchi-Ruscione E & Paini A (2017). *Tides of innovation in Oceania: value, materiality and place*, ANU Press, Canberra.
- Government of Samoa (2016). *Agriculture Sector Plan 2016–2020*, Ministry of Agriculture and Fisheries, Apia, accessed 30 June 2020, <https://pafpnet.spc.int/attachments/article/560/ASP%20Vol%201%20Agriculture%20Sector%20Plan%2026.05.16.pdf> (inyurl.com/y4degbfv).
- Government of Solomon Islands (2015). *Agriculture and livestock sector policy*, Ministry of Agriculture and Livestock, Honiara, accessed 30 June 2020, [https://pafpnet.spc.int/images/articles/policy-bank/solomon/Solomons-Islands-NALSP\\_Final%20Draft\\_151118.pdf](https://pafpnet.spc.int/images/articles/policy-bank/solomon/Solomons-Islands-NALSP_Final%20Draft_151118.pdf).
- Government of Tuvalu (2016). *Tuvalu National Agriculture Sector Plan, 2016–2023*, Department of Agriculture, Funafuti, accessed 7 July 2020, <http://extwprlegs1.fao.org/docs/pdf/tuv170765.pdf>.
- Government of Vanuatu (2015). *Vanuatu Agriculture Sector Policy*, Ministry of Agriculture, Livestock, Forestry, Fisheries, and Biosecurity, Port Vila, accessed 30 June 2020, [https://malffb.gov.vu/doc/Vanuatu\\_Agriculture\\_Sector\\_Policy.pdf](https://malffb.gov.vu/doc/Vanuatu_Agriculture_Sector_Policy.pdf).
- Halavatau S (2018). *Growing root crops on atolls*, SPC, Suva.

- Hayward B, Salili DH, Tupuana'i LL & Tualamali'i J (2020). It's not "too late": learning from Pacific small island developing states in a warming world. *Wiley Interdisciplinary Reviews: Climate Change* 11(1):e612, doi:10.1002/wcc.612.
- Hoy C (2020). *Poverty and the pandemic in the Pacific*, devpolicy@ANU blog, 12 June 2020, accessed 23 July 2020, <https://devpolicy.org/poverty-and-the-pandemic-in-the-pacific-20200615-2/>.
- IHME (Institute for Health Metrics and Evaluation) (2018). *Global burden of disease compare*, accessed 10 July 2020, <http://vizhub.healthdata.org/gbd-compare>.
- Krishant N (2020). *PM confirms 115,000 Fijians have lost their jobs or have had their hours cut as a result of COVID-19*, Fiji Village, Suva, accessed 9 July 2020, [www.fijivillage.com/news/PM-confirms-115000-Fijians-have-lost-their-jobs-or-have-had-their-hours-cut-as-a-result-of-COVID-19-8fxr45/](http://www.fijivillage.com/news/PM-confirms-115000-Fijians-have-lost-their-jobs-or-have-had-their-hours-cut-as-a-result-of-COVID-19-8fxr45/).
- Leal Filho W, Ha'apio MO, Lütz JM & Li C (2020). Climate change adaptation as a development challenge to small Island states: a case study from the Solomon Islands. *Environmental Science & Policy* 107:179–187, doi:10.1016/j.envsci.2020.03.008.
- Mansur A, Doyle J & Ivaschenko O (2018). *Cash transfers for disaster response: lessons from Tropical Cyclone Winston*, Development Policy Centre Discussion Paper 67, Development Policy Centre, ANU.
- McClure H (2020). *COVID-19- The Pacific response: 22 July*, Asia and the Pacific Policy Society, accessed July 23 2020, [www.policyforum.net/covid-19-the-pacific-response-22-july/](http://www.policyforum.net/covid-19-the-pacific-response-22-july/).
- McGregor A (2007). The export of horticultural and high-value agricultural products from the Pacific islands. *Pacific Economic Bulletin* 22(3).
- McGregor A, Bourke M, Manley M, Tubuna S & Deo R (2009). Pacific island food security: situation, challenges and opportunities. *Pacific Economic Bulletin* 24:24–42
- McGregor A, Kaoh P, Mariner LT, L'al PN & Taylor M (2011). *Assessing the social and economic value of germplasm and crop improvement as a climate change adaptation strategy: Samoa and Vanuatu case studies*, IUCN, Suva
- Narayan V (2020). *CSO Alliance calls for action after reporting 200% increase in violence against women, lack of food, unwanted pregnancies and increasing thefts of root crops*, Fiji Village, accessed 12 July 2020, [www.fijivillage.com/news/CSO-Alliance-calls-for-action-after-reporting-200-increase-in-violence-against-women-lack-of-food-unwanted-pregnancies-and-increasing-thefts-of-root-crops-5rx8f4/\(tinyurl.com/y2qooej3\)](http://www.fijivillage.com/news/CSO-Alliance-calls-for-action-after-reporting-200-increase-in-violence-against-women-lack-of-food-unwanted-pregnancies-and-increasing-thefts-of-root-crops-5rx8f4/(tinyurl.com/y2qooej3)).
- PIFON (Pacific Island Farmer Organisations Network) (2020). *COVID-19 & agriculture: Pacific farmers have their say*, Pacific Island Farmer Organisations Network, Suva.
- Piturara J (2020). *COVID-19 impact on fishing and coastal communities: Russell Islands, Solomon Islands*, LMMA Network, Russell Islands, Solomon Islands.
- Plahe JK, Hawkes S & Ponnampерuma S (2013). The corporate food regime and food sovereignty in the Pacific islands. *The Contemporary Pacific* 25(2):309–338.
- Radio New Zealand (2020). *Food gardens for urban dwellers in Vanuatu's capital*, accessed 6 July 2020, [www.rnz.co.nz/international/pacific-news/420570/food-gardens-for-urban-dwellers-in-vanuatu-s-capital](http://www.rnz.co.nz/international/pacific-news/420570/food-gardens-for-urban-dwellers-in-vanuatu-s-capital).
- Refugees International (2020). *A new vulnerability: COVID-19 and Tropical Cyclone Harold create the perfect storm in the Pacific*, accessed 13 July 2020, [www.refugeesinternational.org/reports/2020/6/1/a-new-vulnerability-covid-19-and-tropical-cyclone-harold-create-the-perfect-storm-in-the-pacific](http://www.refugeesinternational.org/reports/2020/6/1/a-new-vulnerability-covid-19-and-tropical-cyclone-harold-create-the-perfect-storm-in-the-pacific).
- Samoa Bureau of Statistics (2016). *Samoa Census 2016*, Samoa Bureau of Statistics, [www.sbs.gov.ws/economics](http://www.sbs.gov.ws/economics).
- Sialaoa A (2019). The Samoa economy 2005. *Pacific Economic Bulletin* 18(2):1–19.



- Singh D, Jackson G, Hunter D, Fullerton R, Lebot V, Taylor M, Iosefa T, Okpul T & Tyson J (2012). Taro leaf blight—a threat to food security. *Agriculture* 2(3):182–203.
- Sleet P (2019). *Fiji: Poor nutrition and agricultural decline has caused food security slump*, Future Directions International, accessed 3 July 2020, [www.futuredirections.org.au/wp-content/uploads/2019/08/Fiji-Poor-Nutrition-and-Agricultural-Degradation-has-Caused-Food-Security-Slump.pdf](http://www.futuredirections.org.au/wp-content/uploads/2019/08/Fiji-Poor-Nutrition-and-Agricultural-Degradation-has-Caused-Food-Security-Slump.pdf).
- SPC (Pacific Community) (2014). *The Pacific Youth Development Framework 2014–2023*, SPC, Noumea/Suva.
- SPC (Pacific Community) (2015). *A new song for coastal fisheries pathways to change: The Noumea strategy*, Pacific Community, Noumea.
- SPC (Pacific Community) (2016). *Strengthening food systems; framework for addressing food security and NCDs in the Pacific*, Pacific Community, Suva.
- SPC (Pacific Community) (2020a). *Economic and social vulnerability indicators*, SPC, Noumea, accessed 22 July 2020, <https://sdd.spc.int/disasters-data/covid-19>.
- SPC (Pacific Community) (2020b). *SPC food systems for health and nutrition integrated programme successfully completes online design workshop series*, SPC, Noumea/Suva, accessed 22 June 2020, [www.spc.int/updates/blog/2020/05/spc-food-systems-for-health-and-nutrition-integrated-programme-successfully](http://www.spc.int/updates/blog/2020/05/spc-food-systems-for-health-and-nutrition-integrated-programme-successfully).
- Taylor M, McGregor A & Dawson B (eds) (2016). *Vulnerability of Pacific island agriculture and forestry to climate change*, SPC, Suva.
- Tin STW, Vivili P, Na'ati E, Bertrand S & Kubuabola I (2020). Insights in public health: COVID-19 special column: the crisis of non-communicable diseases in the Pacific and the Coronavirus disease 2019 pandemic. *Hawai'i Journal of Health & Social Welfare* 79(5):147.
- UNDP (United Nations Development Programme) (2020). *Human development reports*, UNDP, accessed 10 July 2020, <http://hdr.undp.org/en/content/2019-human-development-index-ranking>.
- UNESCAP (2018). *Ocean cities of the Pacific islands: Policy brief #1 the ocean and the city*, UNESCAP.
- UN Habitat (2015). *Urbanization and climate change in small island developing states*, UN Habitat: Nairobi, Kenya.
- UN Women (2016). *Markets for change in Vanuatu*, UN Women, accessed 6 July 2020, <https://asiapacific.unwomen.org/en/digital-library/publications/2016/02/markets-for-change-vanuatu>.
- Wairiu M (2017). Land degradation and sustainable land management practices in Pacific island countries. *Regional Environmental Change* 17(4):1053–1064.
- WHO (World Health Organization) (2020). *COVID-19 Pacific islands situation report*, WHO, accessed 24 July 2020, [www.who.int/westernpacific/emergencies/covid-19/pacific/situation-reports](http://www.who.int/westernpacific/emergencies/covid-19/pacific/situation-reports).
- Wilson C (2020). *Demanding the future: navigating the Pacific's youth bulge*, Lowy Institute, accessed 12 July 2020, [www.lowyinstitute.org/publications/demanding-future-navigating-pacific-youth-bulge](http://www.lowyinstitute.org/publications/demanding-future-navigating-pacific-youth-bulge).
- World Bank (2018). *The state of social safety nets*, World Bank, Washington DC.
- World Bank (2020). The World Bank Databank for Health, Nutrition and Population Statistics, accessed 10 July 2020, <https://databank.worldbank.org/home.aspx>.