



# **Economic Impacts of Natural Hazards on Vulnerable Populations in VANUATU**

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# List of abbreviations

<b>ADB</b>	Asian Development Bank
<b>CRED</b>	Centre for Research on the Epidemiology of Disasters
<b>CSIRO</b>	Commonwealth Scientific and Industrial Research Organisation
<b>EM-DAT</b>	Emergency Events Database
<b>ESCAP</b>	Economic and Social Commission for Asia and the Pacific
<b>GDP</b>	Gross Domestic Product
<b>GFDRR</b>	Global Facility for Disaster Reduction and Recovery
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit
<b>IASC</b>	Inter-Agency Standing Committee Reference Group on Risk, Early Warning and Preparedness
<b>IDMC</b>	Internal Displacement Monitoring Centre
<b>IFRC</b>	International Federation of Red Cross and Red Crescent Societies
<b>ILO</b>	International Labour Organization
<b>IMF</b>	International Monetary Fund
<b>INFORM</b>	Index for Risk Management
<b>MSME</b>	Micro-, small-, and medium-sized enterprises
<b>NDMO</b>	National Disaster Management Office (Vanuatu)
<b>OCHA</b>	United Nations Office for the Coordination of Humanitarian Affairs
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>PCRAFI</b>	Pacific Catastrophe Risk Assessment and Financing Initiative
<b>SPC</b>	Secretariat of the Pacific Community
<b>TC</b>	Tropical Cyclone
<b>UNDP</b>	United Nations Development Programme
<b>UNDRR</b>	United Nations Office for Disaster Risk Reduction
<b>UNFPA</b>	United Nations Population Fund
<b>UNICEF</b>	United Nations Children's Fund
<b>USD</b>	United States dollar
<b>VUV</b>	Vanuatu vatu (unit of currency)
<b>WASH</b>	Water, Sanitation and Hygiene
<b>WFP</b>	World Food Programme
<b>WTO</b>	World Trade Organization

# Executive summary

**Vanuatu is highly exposed to natural hazards, with cyclones regularly damaging property and causing long-term cumulative economic harm.**

Tropical cyclones, with associated storm surges and flooding, are the principal hazard affecting Vanuatu, but the country is also exposed to earthquakes and tsunamis, volcanoes, and droughts. Climate change is expected to exacerbate weather-related hazards.

**Vanuatu's relatively small economy, dominated by tourism and subsistence agriculture, is highly vulnerable to natural hazards.** Tourism is nature-based and dependent on coastal and inland ecosystems which are vulnerable to damage from natural hazards. Agriculture is vulnerable to damage from cyclones and droughts, and the majority of the population of Vanuatu relies heavily on subsistence agriculture for livelihoods and food security. Climate change is expected to adversely affect agriculture through increased frequency of extreme weather events, sea level rise, and disruption of aquatic ecosystems.

**Natural hazards disproportionately affect poor people, workers in the informal economy, women, and youths.** Poor people tend to be more exposed to hazards than wealthier people, are more severely affected by hazards, and have fewer resources available to them to cope when disasters do occur. Poverty is a significant issue in Vanuatu, although there is a lack of recent data to confirm the current situation, and the country has high levels of informal and vulnerable employment and subsistence economic activity. Gender inequality is a significant challenge, and women and girls are often excluded from decision-making roles, limited in economic opportunities, and suffer high levels of gender-based violence. Youths are affected by disruption to education caused by natural hazards and from a shortage of employment opportunities which is due in part to the effects of natural hazards.

**Support systems that can help poor and disadvantaged populations cope with the impacts of natural hazards include:**

- **Social protection systems that can rapidly adapt** in crisis situations can support the immediate needs of affected people as well as longer-term reconstruction. Vanuatu has very limited social protection systems in place but has undertaken some small-scale pilot projects in partnership with international agencies.
- **Remittances** contribute to poverty reduction, wealth creation, social protection, and economic growth in many countries. In Vanuatu, remittances are low compared with regional peers, but are rising and becoming an increasingly important source of income and protection for households.
- **Financial inclusion** can be a significant contributor to development, poverty reduction, and disaster resilience. Financial inclusion currently plays a limited role in disaster resilience in Vanuatu, as the economy is very much cash-based and there is limited familiarity with and uptake of financial services.
- **Insurance** can be an important tool for managing risks associated with natural hazards, but insurance is not widely available or commonly used in Vanuatu. The majority of people and businesses have no insurance protection, and coverage against natural hazards is difficult to obtain.
- **Migration**, both internally and internationally, can support development and disaster resilience. Vanuatu currently has low levels of emigration, but has been an increasingly active participant in seasonal worker programs in the region. Relocation of settlements at risk of natural hazards has been undertaken in several instances and Vanuatu is seen as a leader in developing appropriate policies on this issue.
- **Community-based support** mechanisms are a common way for communities to manage risk, especially in rural and poor communities. Vanuatu has very strong traditions of community support, and has resources of traditional knowledge and traditional governance structures that greatly enhance disaster resilience.



# 1. Hazard and exposure

## 1.1. Overview of risks

**Pacific island countries are widely regarded as experiencing the highest risks associated with natural hazards in the world due to their high exposure to a variety of hazards, their geographical remoteness, and their dispersion across a large area** (ADB [Asian Development Bank], 2018, p. 2; World Bank, 2017a, p. 81). Across the region, hydrological and meteorological events cause the majority of economic losses, with cyclones being the most serious hazard, while geo-hazards are the major cause of human loss (Utz, 2017, p. 81).

**Vanuatu is ranked as the most hazardous country in the world by WorldRiskIndex on the basis of its high exposure to natural hazards and relatively low coping capacity** (Day et al., 2019). An International Monetary Fund (IMF) study estimates that Vanuatu has a 57% chance of suffering a significant<sup>1</sup> disaster related to natural hazards each year (Lee et al., 2018, p. 7). The Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) estimates that cyclones, earthquakes, and tsunamis cause average annual damage and losses equivalent to 6.6% of Gross Domestic Product (GDP), and that within the next 50 years, Vanuatu has a 50% chance of experiencing a loss due to cyclones, earthquakes, or tsunamis valued at more than 45% of GDP, and a 10% chance of a loss exceeding 74% of GDP (PCRAFI, 2011, pp. 1, 5).

**Tropical cyclones and earthquakes are the principal hazards affecting Vanuatu, although the country is also exposed to volcanoes, tsunamis, and droughts.** Vanuatu is located in an area known for the frequent occurrence of tropical cyclones with damaging winds, rains, and storm surge (PCRAFI, 2011, p. 3). It is also located on the Pacific “Ring of Fire”, placing it at risk of earthquakes and tsunamis (PCRAFI, 2011, p. 3), which are rare, but can be extremely damaging when they do occur. The effects of climate change in Vanuatu by the end of this century are expected to include continued El Niño and La Niña events, rising annual mean temperatures and maximum daily temperatures, continued ocean acidification and increased coral bleaching, continued sea level rise, and slightly decreased frequency of cyclone formation but increased maximum wind speeds (Australian Bureau of Meteorology and CSIRO [Commonwealth Scientific and Industrial Research Organisation], 2014, pp. 320–339).

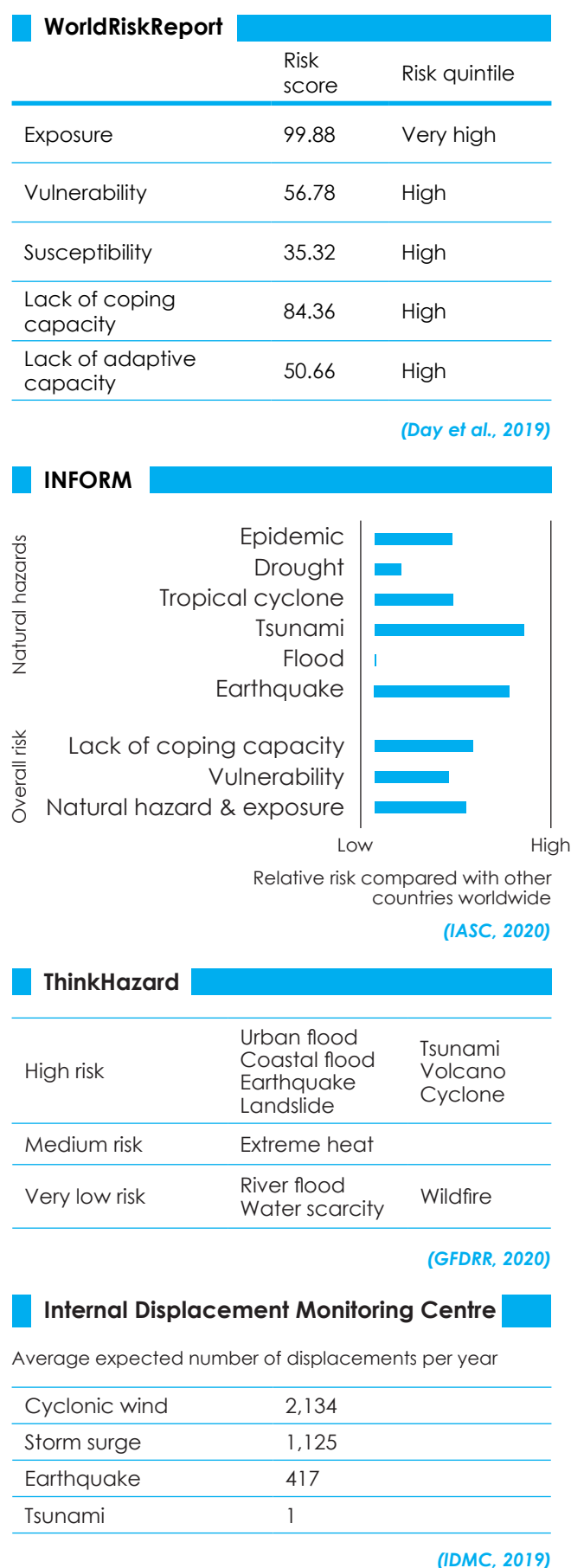
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<sup>1</sup> This analysis was based on the Emergency Events Database (EM-DAT), which counts disasters involving 10 or more deaths, 100 or more people affected, the declaration of a state of emergency, or a call for international assistance.

**Different agencies, using different methodologies, provide different assessments of risk for Vanuatu.**

- **WorldRiskReport**<sup>2</sup> ranks Vanuatu as the most hazardous country in the world due to high exposure to natural hazards and lack of coping capacities. The ranking process uses 27 indicators and assigns countries scores ranging from 0 (least risk) to 100 (greatest risk) (Day et al., 2019, pp. 44, 56).
- **INFORM (Index for Risk Management)**<sup>3</sup> assesses the relative risk of countries experiencing humanitarian crises, taking into account exposure to hazards, vulnerability of the population, and coping capacity. INFORM ranks Vanuatu joint 50th (tied with Tonga) out of 191 countries on exposure to natural hazards, meaning that approximately one quarter of the countries of the world have higher risk. It considers Vanuatu to have particularly high risks of tsunamis, earthquakes, and cyclones, and a low risk of flood and drought (IASC [Inter-Agency Standing Committee Reference Group on Risk, Early Warning and Preparedness], 2020).
- **ThinkHazard**<sup>4</sup> provides an overview of natural hazards at national and local levels. It considers Vanuatu to have a high risk of flooding in urban and coastal areas, geophysical hazards, and cyclones (GFDRR [Global Facility for Disaster Reduction and Recovery], 2020).
- **The Internal Displacement Monitoring Centre (IDMC)**<sup>5</sup> models the risk of future population displacements, and projects the greatest risks for Vanuatu to be related to cyclones and storm surge (IDMC, 2019).

**Figure 1: Natural Hazard Forecasts**



<sup>2</sup>Developed by Ruhr University Bochum and Bündnis Entwicklung Hilft.

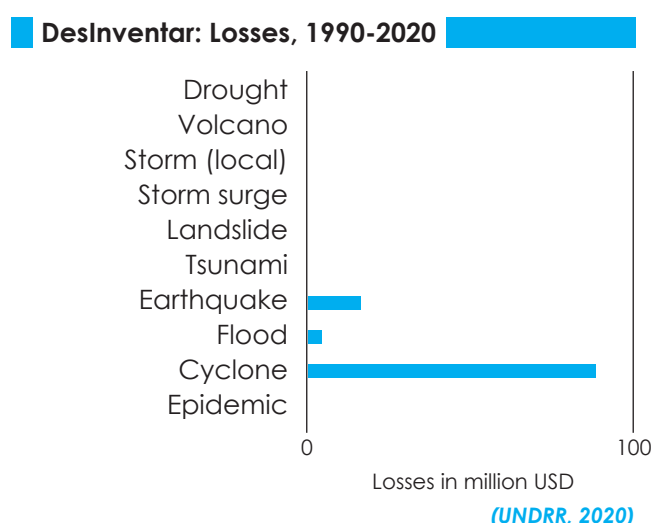
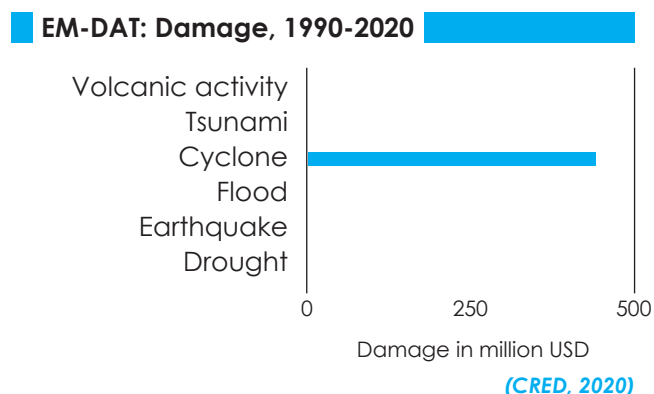
<sup>3</sup>Developed by the Inter-Agency Standing Committee Reference Group on Risk, Early Warning and Preparedness and the European Commission.

<sup>4</sup>Developed by the Global Facility for Disaster Reduction and Recovery (GFDRR) managed by the World Bank.

<sup>5</sup>Part of the Norwegian Refugee Council, a humanitarian non-governmental organization.

**Agencies that record past disasters agree that cyclones have caused the greatest economic losses in Vanuatu.** DesInventar<sup>6</sup> and EM-DAT<sup>7</sup> (Emergency Events Database) are the two main global datasets of disasters related to natural hazards. They use different inclusion criteria, data sources, and reporting practices, so they are not necessarily comparable. In particular, DesInventar includes significantly more events than EM-DAT, especially high-frequency, low-impact events; EM-DAT tends to show lower estimates of impacts and to lack estimates of damages in smaller countries; data collection practices in both datasets appear to vary from one country to another and may not always be comparable between countries; and both datasets appear to cover flooding inadequately (Edmonds & Noy, 2018, pp. 482–484). For Vanuatu, both datasets agree that cyclones are the hazards that have caused the most damage or loss, although they differ slightly regarding the number of events and magnitude of damage or loss that they record (CRED [Centre for Research on the Epidemiology of Disasters], 2020; UNDRR [United Nations Office for Disaster Risk Reduction], 2020). PCRAFI has also compiled a database cataloguing more than 600 disasters across 15 countries in the region (PCRAFI, 2013, pp. 53–57). Of the 82 events recorded for Vanuatu, almost all were cyclones (50) or earthquakes (26); no tsunamis or storm surges were recorded (PCRAFI, 2013, p. 57).

**Figure 2: Historical Disasters**



**PCRAFI: number of recorded disasters**

Tropical cyclone	50
Earthquake	26
Flood	3
Severe local storm	2
Landslide	1
Storm surge	0
Tsunami	0

(PCRAFI, 2013, p. 57)

<sup>6</sup> Operated by the United Nations Office for Disaster Risk Reduction (UNDRR), drawing on data from partners around the world; data for the Pacific region are provided by the Secretariat of the Pacific Community (SPC).

<sup>7</sup> Operated by the Centre for Research on the Epidemiology of Disasters (CRED) at the Catholic University of Louvain.

## 1.2. Cyclones

**Cyclones, bringing damaging winds, heavy rain, flooding, and storm surges, are the most significant natural hazard for Vanuatu.** The country experiences an average of 2 to 2.4 cyclones per year, mainly between November and April (Australian Bureau of Meteorology and CSIRO, 2014, p. 320; Handmer & Iveson, 2017, p. 60). Storm surges associated with cyclones, and flooding due to heavy rains, are common occurrences (Jackson et al., 2017, p. 365). Landslides are also occasionally triggered by precipitation from cyclones (Jackson et al., 2017, p. 365). The average annual losses caused by cyclones has been estimated at 5.0% of GDP (PCRAFI, 2011, p. 5).

**In 2015, TC (Tropical Cyclone) Pam, the most intense cyclone in the country's history, caused widespread damage and economic loss.** The storm caused damage and loss estimated at 64% of GDP, temporarily displaced 65% of households in affected areas (mostly finding shelter with friends, family, or community shelters in their local areas), destroyed crops on a large scale leading to food security issues and reliance on emergency food aid, damaged and contaminated water supplies, damaged 81% of homes in affected areas, and "compromised the livelihoods of at least 80% of Vanuatu's rural population" (Government of Vanuatu, 2015b, pp. ix, 3; Handmer & Nalau, 2019, p. 374; SPC [Secretariate of the Pacific Community], 2016, pp. 6, 11; WFP, 2016, pp. 5–6). Heavy rain and storm surges led to coastal and fluvial flooding, and damage to buildings and other infrastructure in some areas (Government of Vanuatu, 2015b, pp. 34, 56, 62; Rey et al., 2017, pp. 263–266). Only 11 people were killed as a result of the cyclone, which is low considering the extensive damage to property that it inflicted; the low death toll is attributed both to government preparedness and to the resilience of the Ni-Vanuatu<sup>8</sup>, who

are experienced at dealing with cyclones (Dornan & Newton Cain, 2015, p. 24). Estimates of the decrease in the country's GDP growth rate attributable to the cyclone vary from 2.0 to 2.8 percentage points (Lee et al., 2018, p. 22; WTO [World Trade Organization], 2019, p. 1).

**Climate change is expected to lead to fewer but more powerful cyclones by the end of this century.** Different climate models produce varying projections of cyclone formation rates, with a majority suggesting a likely decrease of 15% to 35% in cyclone formation affecting Vanuatu by the end of the century. Global projections suggest that maximum wind speeds could increase by 2% to 11%, which would lead to exponentially higher damage, and that rainfall within 100 km of cyclone centers could increase by around 20%; there are no local projections of cyclone intensity specifically for Vanuatu (ADB, 2018, p. 5; Australian Bureau of Meteorology and CSIRO, 2014, p. 333).

**Global evidence shows that the economic damage caused by cyclones is long-lasting and cumulative.** A study of the long-term economic impacts of tropical cyclones that examined 6,712 storm events found that the impact on GDP caused by a cyclone lasts at least twenty years, and that countries that are repeatedly exposed to cyclones experience a cumulative and effectively permanent loss to GDP. More powerful storms cause more long-term damage: each additional meter per second (3.6 km/h) increase in average annual wind exposure lowers per capita economic output by 0.37% twenty years later, and an increase in a country's cyclone exposure by one standard deviation lowers GDP by 3.6 percentage points twenty years later (Hsiang & Jina, 2014). One study in Vanuatu, on Efate island, indicated that recovery from TC Pam at the local village level could take anywhere from five months to three years: some respondents

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<sup>8</sup> The people of Vanuatu.



reported that crops and fruit trees could take a year and a half to be re-established, and that rebuilding most houses took two to three years with some houses still not fully repaired up to four years after the cyclone, while other respondents

reported that food supplies were fully available within one to two months, that communities had essentially recovered in four to five months, and that most houses were rebuilt within one year (Jennings et al., 2020, p. 29).

**Table 1: Livelihood disruptions resulting from TC Pam**

	Activity	Profitability	Post-cyclone status and issues	Anticipated time to recovery
Activities primarily undertaken by men	Fishing (tuna, marlin, reef fish)	High	Cannot be easily located	3 months
	Trapping lobster and coconut crabs	High	Cannot be located, may be gone	6 months
	Sandalwood farming	High	Some seedlings destroyed, but trees mainly intact	3 months
	Kava cultivation	High	Largely wiped out	4 years
	Copra cultivation	High	Largely wiped out	12 months
Activities primarily undertaken by women	Sales of Prepared Foods (local)	Low	Not possible in current conditions	6 months
	Weaving handicrafts	Medium	Pandanus all destroyed	12 months
	Sewing (for local sale)	Low	Sewing machine damaged and lost	Variable
Activities undertaken by men and women	Vegetable and fruit sales (to Vila and Tanna)	Medium	Mainly destroyed	6 months
	Tourist services	Medium	Interrupted due to damage and lack of transport	Variable
	Work in guesthouses and restaurants	Medium	Many damaged and closed	Variable
	Cultivation of other crops	Medium	Only root crops left in most locations	3–6 months

(Government of Vanuatu, 2015b, p. 97)

### 1.3. Earthquakes and tsunamis

**Vanuatu is located on the Pacific “Ring of Fire”, placing it at risk of earthquakes and tsunamis** (PCRAFI, 2011, p. 3). Such events are rare but can be extremely damaging when they do occur. Vanuatu has experienced 18 significant earthquakes<sup>9</sup> since 2000, or about 0.9 earthquakes per year (National Geophysical Data Center / World Data Service (NGDC/WDS), 2020). The most recent non-volcanic earthquake, of magnitude 7.0, occurred in Malampa province in April 2016 and led to

coastal uplift with associated coral death, loss of fishing grounds and reduced sea access for fishing but no significant damage to crops or property (Eriksson et al., 2017, p. 52). Vanuatu has a 40% chance of experiencing a significant earthquake that could cause heavy damage to well-engineered buildings within the next 50 years (PCRAFI, 2011, p. 3). On average, the country is expected to incur damage amounting to 1.5% of GDP due to earthquakes and tsunamis (PCRAFI, 2011, p. 5).

### 1.4. Volcanoes

**Most of Vanuatu’s islands are volcanic in origin, and there are six active volcanoes in the country which have triggered humanitarian relief efforts and large-scale evacuations several times in recent years.** Mount Yasur on Tanna island (population approximately 29,000), for example, is an almost continuously active volcano that emits gases, smoke, ash, and frequent bursts of lava (Nimau et al., 2019, pp. 7, 11–12). Ash, in particular, routinely affects large areas of the island, with larger eruptions sometimes prompting significant humanitarian interventions. An eruption in 2013 damaged most of the vegetation across the Whitesands district and led to a humanitarian relief effort

costing about VUV 47 million (approximately USD 493,000), mostly funded by the Vanuatu government with some assistance from China and New Zealand (Nimau et al., 2019, pp. 12–15), and another ash fall in 2016 affected 20,000 people and led to a humanitarian relief effort costing at least VUV 150 million (approximately USD 1.4 million) (PCRAFI, 2018, p. 1). More recently, eruptions of the volcano Manaro Voui on Ambae island led to evacuating the entire population, approximately 11,000 people, to other islands in 2017 for a month, and then again in mid-2018 for approximately six months (IDMC, 2018, p. 31; IOM, 2019; PCRAFI, 2018, pp. 2–5; WTO, 2019, p. 27).

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<sup>9</sup> Defined as meeting at least one of the following criteria: caused deaths, caused moderate damage (approximately \$1 million or more), magnitude 7.5 or greater, Modified Mercalli Intensity X or greater, or the earthquake generated a tsunami (National Geophysical Data Center / World Data Service (NGDC/WDS), 2020).

## 1.5. Droughts

**Droughts have serious impacts on subsistence agriculture and on water supplies, which in Vanuatu are heavily dependent on rainwater harvesting.** Droughts are generally associated with the El Niño<sup>10</sup> phenomenon, which affects precipitation patterns across the Pacific. Region-wide, high dependence on subsistence agriculture makes Pacific islands vulnerable to the effects of El Niño conditions including drought (Thomalla & Boyland, 2017, p. 40). In Vanuatu, the drought that occurred during the 2016 El Niño led to shortages of drinking water, hindered the regrowth of crops damaged by TC Pam the previous year, and required emergency food distribution targeting 90,000 people (Eriksson et al., 2017, p. 52; OCHA [United Nations Office for the Coordination of Humanitarian Affairs], 2015, p. 4).

**The impact of climate change on the risk of drought is uncertain.** The incidence of drought may remain approximately unchanged under most carbon emissions scenarios, and may decrease slightly under conditions of high emissions, but these projections carry a low degree of confidence because there is a lack of consensus on projections of average rainfall and on potential changes in the El Niño phenomenon, which directly influences drought (Australian Bureau of Meteorology and CSIRO, 2014, pp. 331–332).

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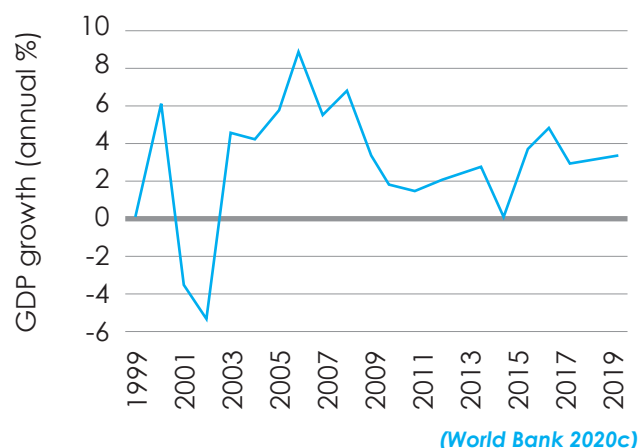
<sup>10</sup> El Niño is a naturally occurring warming of the eastern tropical Pacific Ocean which is observed every two to seven years, leading to weakening of prevailing trade winds, reduced ocean upwelling and altered ocean currents, and changes to wind, sea surface temperature and precipitation patterns (Australian Bureau of Meteorology and CSIRO, 2014, pp. 347–348).

## 2. Vulnerability and Impacts

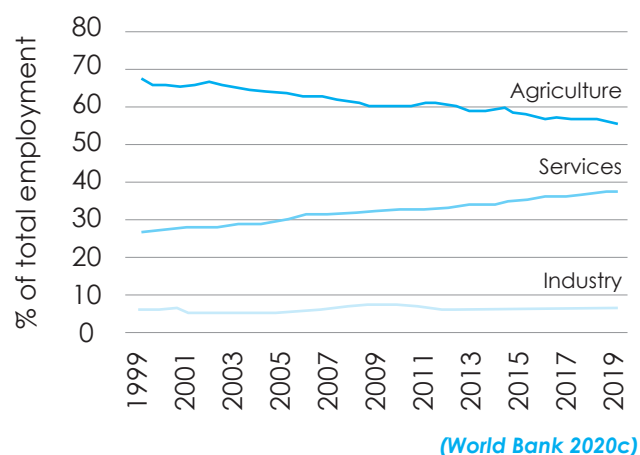
### 2.1. Economic profile

**Vanuatu's relatively small economy is dominated by a large and growing tourism industry and subsistence agriculture.** Vanuatu ranks 141<sup>st</sup> out of 189 countries on the Human Development Index, falling within the 'medium human development' category (UNDP [United Nations Development Programme], 2019, p. 302). Economic development is hampered by its geographical remoteness, widely dispersed islands, high costs of public service provision and of transportation and trade, and vulnerability to external economic shocks, notably those resulting from natural hazards (Government of Vanuatu, 2015b, p. 2; WTO, 2019, p. 25). Its relatively small size means that domestic markets tend to be too small for industries to benefit from economies of scale (Government of Vanuatu, 2015b, p. 2). Economic activity is concentrated in the two most populous urban centres, Port Vila and Luganville (Rust, 2019, p. 10). The formal economy is narrowly based, driven primarily by tourism, agriculture, international aid, and construction (Government of Vanuatu, 2015b, p. 2; Handmer & Iveson, 2017, p. 61; PCRAFI, 2015, p. 7; WTO, 2019, p. 25). Tourism is the largest industry by share of GDP and by share of export earnings (see section 2.3 below), but agriculture, mostly carried out on a subsistence basis, is the dominant economic activity, with approximately 80% of the population relying to some degree on subsistence farming for livelihood and food security (VNSO [Vanuatu National Statistics Office], 2013, cited in Government of Vanuatu, 2015b, p. 16).

■ Figure 3: Vanuatu GDP annual change ■



■ Figure 4: Vanuatu employment by sector ■



## 2.2. Agriculture and fisheries

**Subsistence agriculture is the principal economic activity and source of livelihoods in Vanuatu.** Although agriculture contributes less to GDP than the service sector, agriculture remains the principal economic activity and source of livelihood for the vast majority of ni-Vanuatu (Mackenzie-Reur & Galgal, 2018, p. 9). Agriculture makes up 25% of GDP and mostly consists of crop production (79% of the agriculture sector) with livestock (14%), forestry (5%), and fisheries (3%) making small contributions (Government of Vanuatu, 2015b, p. 16). Vanuatu's agriculture sector is dominated by semi-subsistence farmers using mostly household labor; approximately 80% of Vanuatu's population relies on agriculture (mainly crops, livestock, and fisheries) for livelihoods and for food and nutrition security, and at least 71% of the rural population derives some income from agricultural activities (VNSO, 2013, cited in Government of Vanuatu, 2015b, p. 16). In 2016, 42% of all households in Vanuatu grew coconuts as cash crops, 32% grew kava, 16% grew cocoa, and 4% grew coffee (Vanuatu National Statistics Office, 2017, p. 217). Kava production nationally has increased significantly in recent years – kava was the country's third largest export commodity in 2014 but made up 53% of all exports by the end of 2019 (Vanuatu Department of Agriculture and Rural Development, 2016, p. 11; Vanuatu National Statistics Office, 2020, p. 2) – so kava's contribution to household incomes is likely to have increased. The extent to which kava may have replaced other crops is uncertain. Nearly all households in coastal villages (32% of all households in Vanuatu) are involved in coastal fishing, mostly at a subsistence level, with about 6% of all households engaged in fishing for sale (Government of Vanuatu, 2015b, p. 17).

**Cyclones cause extensive damage, loss of production, and harm to livelihoods in the agriculture sector.** The total damage and economic losses in the agricultural sector

caused by TC Pam were estimated at VUV 6.1 billion (approximately USD 56 million; 8.0% of GDP) (Government of Vanuatu, 2015b, pp. 16, 127), but the financial value of the crops lost does not fully represent the livelihood and food security impacts on rural households. Crops suffered 69% of the total agricultural damage and loss, followed by forestry (16%), livestock (9%), and fisheries (6%) (Government of Vanuatu, 2015b, p. 16). Most of the crop losses (58%) were in kava, a major export crop, which is fragile and vulnerable to strong winds (Government of Vanuatu, 2015b, p. 18). Approximately half of all agricultural households in the affected areas lost all or part of their crops, including crops such as kava, copra, and cocoa that will take up to a year to re-establish (potentially three to four years for kava) (Government of Vanuatu, 2015b, pp. 19, 90, 97). Across the affected areas, 85% of households were engaged in subsistence farming, and slightly more than half of these households had no other sources of income (REACH, 2015, pp. 34–35). Following the cyclone, food security was a significant problem: food prices rose dramatically in rural areas, availability of fruit and vegetables was very restricted, people in affected areas were rationing food, and about 200,000 people received emergency food aid from the government, NGOs, and the World Food Programme (Hollema et al., 2015, pp. 10–16; Wentworth, 2020, pp. 78–81; WFP, 2016, pp. 5–6). Within one month of the cyclone, 85% of households had replanted their subsistence gardens, but even the fastest-growing crops needed at least three months to reach maturity (REACH, 2015, p. 35). Fishing was badly affected for several weeks following the cyclone, but served as an alternative source of food and livelihood for many households whose crops had been damaged or destroyed, and fishing had mostly returned to normal by the time of an assessment a year and a half later, apart from the loss of some fishing areas (Eriksson et al., 2017, pp. 52–53).



**Climate change is expected to adversely affect agriculture and fisheries through increased frequency of extreme weather, changes in sea level rise, and disruption of aquatic ecosystems.** Across the Pacific region, most cash crops are vulnerable to extreme weather events. High winds from more intense tropical cyclones severely threaten crops such as bananas, breadfruit, and coconuts, and sugar cane is expected to be affected by flooding (Bell et al., 2016, p. 17). In Vanuatu, projected consequences of climate change

on agriculture include reduced availability of fresh water, changes in growing seasons, increases in pests and diseases, sea level rise, saltwater inundation and intrusion into coastal land and groundwater, ocean acidification and coral reef deterioration, reduced fisheries productivity, loss of coastal land, damage to infrastructure and equipment, and compromised food security (Government of Vanuatu, 2015a, pp. 6–7). It is possible that cacao production could be enhanced by rising temperatures (Bell et al., 2016, p. 17).

## 2.3. Tourism

**Vanuatu has a large and growing tourism industry which is extremely important to the country's economy, but vulnerable to natural hazards.** Estimates of the economic importance of travel and tourism to Vanuatu range between 35% and 45% of GDP, between 14% and 38% of total employment, and up to 67% of total export earnings (Connel, 2019, p. 327; ILO [International Labour Organization], 2017a, p. 30; World Travel & Tourism Council, 2020; WTO, 2019, p. 31). The World Travel and Tourism Council predicts industry growth of 4.1% per year over the next decade with tourism's contribution to Vanuatu's GDP expected to reach 50% of GDP by 2027 (WTO, 2019, p. 31).

**Tourism in Vanuatu is nature-based and highly dependent on coastal as well as inland ecosystems.** Major attractions include adventure tourism, volcanoes, beaches, cruising, cultural activities, diving and snorkeling, eco-tourism, and fishing (Perrottet & Garcia, 2016, pp. 12–13). Across the Pacific region, impacts of climate change are expected to include increased intensity of storms, increased temperatures and extreme weather events, damage to infrastructure, beach erosion, damage to marine ecosystems, and policy responses such as carbon taxes which will increase travel costs and negatively affect tourism development (Van Der Veeken et al., 2016, p. 53).

**Tropical cyclone Pam caused significant economic harm to the tourism sector, mostly through damage to accommodation properties, but the impacts lasted only one season.** Damage and economic loss to the tourism sector was estimated at VUV 9.5 billion (approximately USD 87 million; 12.5% of GDP) (Government of Vanuatu, 2015b, p. 29). Most of the damage was suffered by accommodation properties (88%), with the greatest damage associated with two major hotels, but widespread lower-value damage was suffered by other accommodation properties and by 88% of all tour operators (Government of Vanuatu, 2015b, p. 31). Women were expected to suffer greater job losses than men, because in post-disaster situations the tourism industry commonly retains managerial and groundskeeping staff, who are mostly male, and lays off housekeeping staff, who are mostly female (Government of Vanuatu, 2015b, p. 34). Tourist arrivals dropped by between 11% and 17% following the cyclone (Perrottet & Garcia, 2016, p. 2; WTO, 2019, p. 31) but the decline was brief and the tourism sector had recovered to pre-cyclone levels by 2017 (Eriksson et al., 2017, p. 52; WTO, 2019, p. 31). Some larger properties were slow to reopen (the Holiday Inn took more than 15 months) but smaller owner-operator guesthouses were able to reopen more quickly; however, “many business owners who had not procured cyclone insurance folded in the aftermath of the storm, unable to reinvest sufficient savings in their businesses or to tap sources of credit” (WTO, 2019, p. 31).

## 2.4. Commerce and industry

**Vanuatu's economy, apart from agriculture and tourism, is largely based on trade, with very little domestic manufacturing.** As of 2013, commerce and industry contributed 36% of GDP, mostly in the form of retail trade (12% of GDP), finance and insurance (7%), and real estate (7%) (Government of Vanuatu, 2015b, p. 23). Manufacturing makes up only 3% of GDP (Government of Vanuatu, 2015b, p. 23). Small-scale production of handicrafts for the tourist market is an important source of livelihoods for independent producers, wholesalers, and market sellers, but the government is making efforts to encourage more local production as it has been estimated that up to 90% of souvenirs sold in Vanuatu are manufactured overseas and imported into the country to be sold to tourists (Vanuatu Department of Industry, 2017, p. 13).

**TC Pam caused widespread damage to buildings and inputs to production.** Damage and economic losses to commerce and

industry were estimated at VUV 3.3 billion (approximately USD 30 million; 4.4% of GDP) (Government of Vanuatu, 2015b, p. 22).

Home-based businesses are presumed to have been badly affected as 81% of households in affected areas reported some level of damage (REACH, 2015, p. 2), but no specific data on home-based small businesses could be located. However, despite the high frequency of natural hazards affecting Vanuatu, in a survey of MSMEs carried out in November 2016, only 1% of respondents identified natural hazards as being among their most pressing problems; most businesses identified more routine concerns such as competition from other businesses (31%) and finding customers (24%) as their most pressing problems (Reserve Bank of Vanuatu, 2016b, p. 27). MSMEs in the agriculture sector did, however, identify natural hazards and climate change as creating credit risk which inhibited borrowing (Reserve Bank of Vanuatu, 2016b, p. 46).

## 2.5. Housing and settlements

**Housing in Vanuatu is often low-quality and vulnerable to cyclone damage.** Seventy-five percent of the population of Vanuatu live in rural areas, with 19% living in the capital, Port Vila, and 6% in the country's second city, Luganville (Vanuatu National Statistics Office, 2017, pp. 95–96). Most construction in rural areas is informal, unregulated, and not built according to any standards or codes, which makes communities vulnerable to building damage and injury resulting from natural hazards (Handmer & Iveson, 2017, p. 64). Vanuatu has a large stock (43%) of houses built using traditional locally-available materials and techniques such as thatch, woven palm fronds, and woven cane; 30% of houses are built of locally-available materials supplemented with features such as timber framing and corrugated galvanized iron roofs; and 27% are of more durable timber or concrete block construction (Government of Vanuatu, 2015b,

p. 36). Studies looking at housing damage after TC Pam arrived at different conclusions: the Shelter Cluster found that buildings constructed in the traditional style survived better than houses using modern materials or methods, while a report by Save the Children concluded that roofs constructed from traditional materials suffered greater damage than roofs constructed from modern materials (Handmer & Iveson, 2017, p. 64) and the government's post-disaster needs assessment concluded that buildings constructed to modern standards survived better and called for more inspections to improve compliance with standards (Government of Vanuatu, 2015b, p. 27). Port Vila also has large informal settlements which house 35% of the city's population (as of 2013), where housing and infrastructure are not disaster-resilient and access to services is poor (NDMO [National Disaster Management Office], 2018, p. 11). These informal settlements

do not have official sanction and are generally based on agreements with local land owners (Handmer & Iveson, 2017, p. 61).

**TC Pam caused extensive damage to housing stock and temporarily displaced 65% of households in affected areas.**

In affected areas, 81% of households reported some level of damage, with the most vulnerable houses being those with thatched roofs (55% to 77% of such houses reported total destruction of the roof, depending on the materials used) and walls and floors of bamboo (56% of bamboo walls and 63% of bamboo floors were completely destroyed) (REACH, 2015, pp. 20–21). Damage to homes also results in loss of income from home-based livelihood activities, which particularly affects women (Government of Vanuatu, 2015b, p. 38). Sixty-five percent of households in the affected areas left their houses to stay in safer locations, suggesting widespread fears that houses were not sufficiently robust to withstand the cyclone (REACH, 2015, p. 2). Most stayed with friends or family in their own community (53%) or in a community-managed shelter such as a school or church (30%) (REACH, 2015, p. 12). By five to

six months after the cyclone, 86% of displaced households had returned home and half of the remainder expected to return home at some point (Shelter Cluster, 2015, p. 14). Rebuilding after TC Pam often tended to be done quickly and cheaply, and buildings were typically restored to their previous conditions in the same locations and using the same materials rather than raising standards (Handmer & Iveson, 2017, pp. 63–64). Within one to one and a half months after the cyclone, 72% of households had completed enough repairs that they “perceived that their immediate shelter needs had been met”, and by five to six months after the cyclone, this had risen to 85% (REACH, 2015, p. 24; Shelter Cluster, 2015, p. 20). Five to six months after the cyclone, 68% of households reported that they had received shelter assistance, consisting mostly of tarpaulins (82%), building materials (35%), blankets (27%), and tool kits (26%) (Shelter Cluster, 2015, p. 16). However, most households (81%) reported that they had relied on using recovered materials (sifting through debris) and locally-available natural materials (Shelter Cluster, 2015, pp. 21–22).

## 2.6. Low-income and informal workers

**Worldwide and across the Pacific, poor and marginalized people are disproportionately exposed to natural hazards.** Poor people often live on low value land in locations where they are more exposed to hazards (including frequent, low-intensity hazards) than wealthier people are. They lack resources to invest in disaster-resilient housing and other infrastructure, their employment and incomes are less secure and they have less access to social protection schemes, and they have limited savings and limited access to insurance or affordable credit. When disaster strikes they are often forced to adopt coping strategies that have long-term negative impacts, such as taking children out of school, selling productive assets, or reducing food intake, and they often receive less post-disaster support, and

less quickly (Hallegatte et al., 2017, p. 4; ILO [International Labour Organization], 2019a, p. 4; SPC, 2018, p. 108; Utz, 2017, p. 90; Wehrhahn et al., 2019, p. 60).

**The impacts of natural hazards are also disproportionately higher for poorer people** (Wehrhahn et al., 2019, p. 60). The same loss affects poor people more severely than wealthy people because “their livelihoods depend on fewer assets, their consumption is closer to subsistence levels, they cannot rely on savings to smooth the impacts, their health and education are at greater risk, and they may need more time to recover and rebuild” (Hallegatte et al., 2018, p. 4). The monetary value of damage to assets and losses to economic production does not fully reflect the

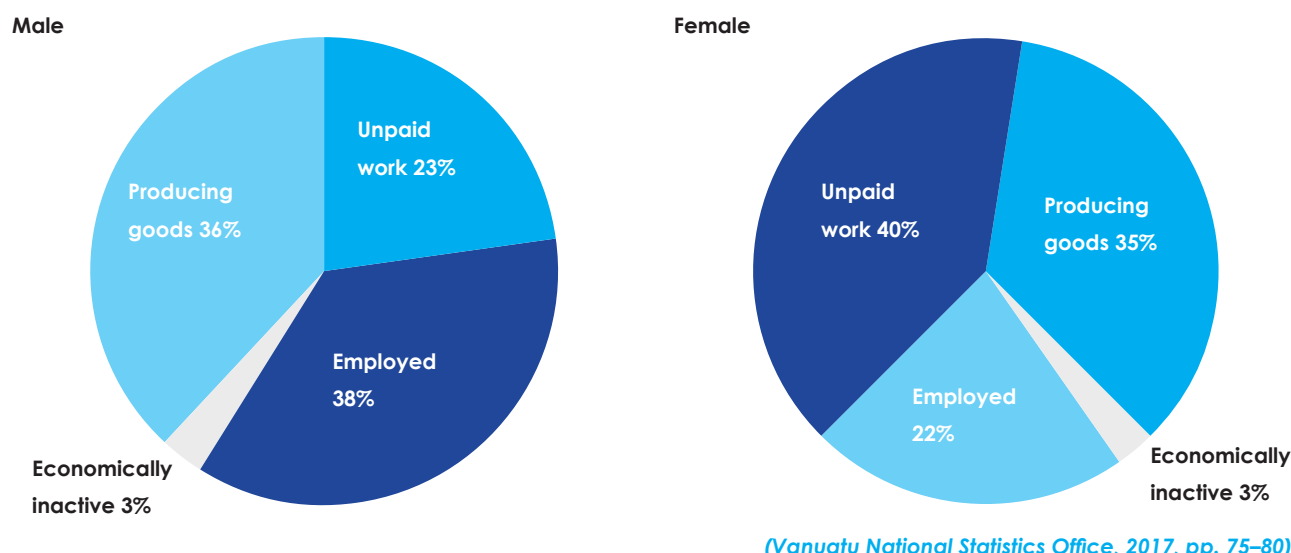
impacts on people's well-being (Hallegatte et al., 2018, p. 4). For example, in Vanuatu, most of the rural population lives in traditional housing made of palm leaves, bamboo and other local materials, which has a low value in monetary terms but is essential to inhabitants (Handmer & Nalau, 2019, p. 374). Women, youth, children, the elderly, people living with disabilities, and people belonging to ethnic or religious minorities are also more severely affected by natural hazards than people who have more wealth, power, and influence. Vulnerable people in all these groups tend to be overrepresented in the informal economy, more likely to be unemployed or in insecure work, and have less access to resources with which to restore their livelihoods or adapt to climate change (ILO, 2019a, p. 12).

**Poverty is a significant issue in Vanuatu, although there is a lack of recent data to confirm the current situation.** The most recent data available are from the 2010 Household Income and Expenditure Survey, which showed

that 13.2% of the population fell below the USD 1.90 per day international poverty line, and 39.5% fell below the USD 3.20 per day lower-middle-income poverty line (World Bank, 2018, p. 1). Vanuatu also has a nationally-defined basic needs poverty line and food poverty line; in 2010, 12.7% of individuals were in basic needs poverty and only 3.2% were in food poverty (Anderson et al., 2017, p. 108). Poverty rates are higher in urban areas than in rural areas (Anderson et al., 2017, p. 23).

**Vanuatu has high levels of subsistence economic activity, and employment is largely informal and vulnerable.** Only 30% of the adult population (excluding full-time students) is in paid employment, with 35% producing goods for their own consumption or for sale, 32% doing unpaid work in a family business or agricultural plantation, or undertaking household duties, and 3% considered economically inactive (Vanuatu National Statistics Office, 2017, pp. 75, 232).

**Figure 5: Adult population by economic activity**



The formal economy is relatively small, but the size of the informal economy is difficult to measure: the government's post-disaster needs assessment following TC Pam estimated that 20% of the labor force (26% of working-age males and 14% of working-age females) were in

formal employment (Government of Vanuatu, 2015b, pp. 88–89), while the ILO estimates that 40% of total employment is informal (ILO, 2017b, p. 31). The ILO also considers 74% of employment in Vanuatu to be vulnerable (including people working on their own account

and contributing family workers) in the sense of suffering from low job and income security and less protection under employment regulation than work in the formal economy (ILO, 2019a, p. 4). Approximately 80% of Vanuatu's population relies on agriculture (mainly crops, livestock, and fisheries) for livelihood and for food and nutrition security, and at least 71% of the rural population derives some income from agricultural activities (VNSO 2013, cited in Government of Vanuatu, 2015b, p. 16).

**TC Pam had severe impacts on people living on low incomes and subsistence livelihoods.**

In affected areas, half of all agricultural households lost part or all of their crops and required support in the short term to

meet minimum needs, and 75% to 95% of income-generating activities were disrupted (Government of Vanuatu, 2015b, pp. xii, 94). On Tanna island, food crops took at least a year to recover, partly due to the impacts of drought conditions caused by El Niño; some remote communities which lacked access to monetary income experienced significant food insecurity with increased health problems (Handmer & Nalau, 2019, p. 375). People dependent on subsistence farming, especially in remote locations with limited market economies, have limited options available to them; they “cannot simply change their livelihoods” (Handmer & Nalau, 2019, p. 371).

## 2.7. Gender

**Worldwide and across the Pacific, women and girls are disproportionately vulnerable to the effects of natural hazards and climate change** (Bogdan et al., 2019; Utz, 2017, p. 90). Women and girls have less ability than men to influence, participate in, and benefit from disaster risk reduction and recovery efforts, and from climate change mitigation and adaptation efforts (Utz, 2017, p. 90). They have less access than men to the resources necessary to cope with and respond to hazardous events, including information, employment opportunities, education, health, land, financial resources and other economic assets, and basic rights (Utz, 2017, p. 90; Vincent et al., 2014, p. 105). Women often have less access than men to early warning systems such as weather forecasts and warnings of floods and water levels, and are often less prepared to understand and act on the information due to gender differences in literacy, mobility, access to public venues, work schedules, and preferences for different communication media (Bogdan et al., 2019, pp. 26–33; IFRC [International Federation of Red Cross and Red Crescent Societies], 2010, p. 32). Women's livelihoods often depend on natural resources that are affected by natural hazards, and on assets that are vulnerable to disasters or to being sold as a negative coping

strategy (Bogdan et al., 2019, pp. iv–v; ILO, 2019a, p. 12). Women also usually have more limited opportunities than men to diversify their livelihoods by taking up new occupations, because of social norms, home-based responsibilities, or limited education (Thomas et al., 2019, p. 706). “Socially constructed roles and responsibilities, occupational segregation, and cultural norms” lead to women bearing burdens that include “increased time and labour workloads, health issues like malnutrition, increased rates of sexual and gender-based violence and even early child marriage” (Bogdan et al., 2019, p. 33). Worldwide, even fatality rates in disasters tend to be higher for women than for men, “primarily due to gendered differences in support to cope with such events and insufficient access to information and early warnings” (Bogdan et al., 2019, p. 33; ILO, 2019a, p. 12).

**Gender also interacts with other social characteristics to affect how individuals are impacted by natural hazards** (Bogdan et al., 2019, p. 4). Across Asia, the Pacific, and Africa, women in rural areas tend to be more vulnerable than those in urban areas; older women and women with disabilities are more severely affected because of a lack of accessible infrastructure and information;



pregnant and lactating women are at higher risk because of inadequate health services following disasters; and widowed and divorced women tend to be more vulnerable (Bogdan et al., 2019, p. 23).

**Gendered social norms mean that men suffer different risks compared to women, particularly physical and mental health risks and pressures for migration.**

Most research on the gendered impacts of climate-related hazards considers effects on women, with “scarce evidence” available about impacts on men (Bogdan et

al., 2019, p. iv). Social norms generally call for men to be “brave and heroic, and engage in risky life-saving behaviors that increase their likelihood of mortality” (Bogdan et al., 2019, p. 25; Vincent et al., 2014, p. 106). They also have increased tendencies to suffer mental health issues from isolation and worry, including depression, and to use alcohol as a coping mechanism (Bogdan et al., 2019, p. 25). Men often migrate (from rural to urban areas, or overseas) in search of new livelihoods, which can strain households and break up families (Bogdan et al., 2019, p. 25).

**Table 2: Gendered impacts of climate change in Asia, the Pacific, and Africa**

	Women	Men
Physical	<ul style="list-style-type: none"> <li>• Higher mortality and morbidity rates in disasters</li> <li>• Extra workloads (time and labor)</li> <li>• Malnutrition</li> <li>• Sexual and gender-based violence during and after disasters</li> </ul>	<ul style="list-style-type: none"> <li>• Mortality risks among men with heroic behavior and rescue workers</li> <li>• Migration for livelihood diversification</li> <li>• Other health issues, like rheumatism</li> </ul>
Material	<ul style="list-style-type: none"> <li>• Loss of small household livestock</li> <li>• Loss of livelihoods connected with natural resources, less time to re-establish them</li> <li>• Loss of land because of inheritance issues</li> <li>• Disparities in access to disaster relief and aid</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of livestock and assets</li> </ul>
Psychological	<ul style="list-style-type: none"> <li>• Psychological issues associated mostly with fear of gender-based violence and feelings of shame during disasters and stress for providing food for the family</li> </ul>	<ul style="list-style-type: none"> <li>• Psychological impacts including social isolation, trauma, depression, stress that can lead to alcohol abuse and even suicide</li> </ul>
Most affected groups	<ul style="list-style-type: none"> <li>• Girls (early marriage) and adolescent girls (risk of sexual harassment)</li> <li>• Rural women and women without access to resources</li> <li>• Women living in low-lying areas</li> <li>• Disabled and older women</li> <li>• Widowed, divorced, and single women</li> <li>• Pregnant and lactating women</li> <li>• Female-headed households</li> </ul>	<ul style="list-style-type: none"> <li>• Rural and poor men</li> <li>• Widowers</li> </ul>
Gender relations	<ul style="list-style-type: none"> <li>• Negative: weaker family structures, domestic violence</li> </ul>	<ul style="list-style-type: none"> <li>• Positive: change in household and community roles, women taking leadership</li> </ul>

(Bogdan et al., 2019, p. 22)

**In Vanuatu, gender inequality is a significant challenge, and women's political and economic participation is significantly limited by social norms.** Women are largely excluded from decision-making processes at the national and local levels, including the traditional local governance systems present in all communities, and face challenges accessing paid employment outside of agriculture (CARE, 2015, p. 3; Government of Vanuatu, 2015b, p. 103, 2015a, p. 26). Men and women tend to undertake different types of livelihood activities: men typically undertake more profitable activities including fishing, growing cash crops, and operating shops, while women are typically involved in activities such as weaving mats and baskets, selling prepared food at markets, sewing clothes for sale, and growing vegetables for subsistence or sale (Government of Vanuatu, 2015b, p. 95). Gender-based inequality is deeper in urban areas than in rural areas, and there is significant disparity in wages and economic opportunities (Rust, 2019, p. 10). The labor force participation rate in 2016 was 61.7% for women and 80.5% for men (ILO, 2017b, p. 29). The government has made significant efforts to acknowledge the impacts of natural hazards on women's social and economic well-being and to collect sex and age disaggregated data in disaster risk reduction work, and is seeking to increase women's participation in decision-making forums (Government of Vanuatu, 2015a, pp. 16, 26), and recent post-disaster needs assessments such as the one that followed TC Pam in 2015 demonstrate significant attention to gender issues.

**Gender-based violence in Vanuatu is widespread and widely accepted based on traditional social norms.** A study on violence against women and girls conducted in 2009 found that 60% who have ever been in a relationship have experienced either physical or sexual violence or both by a husband or intimate partner (Vanuatu Women's Centre,

2011, p. 55). A 2013 survey showed that 56% of men and 60% of women agree that a husband is justified in beating his wife.<sup>11</sup> (Vanuatu Ministry of Health; Vanuatu National Statistics Office; and the Secretariat of the Pacific Community, 2013, pp. 228–232). Marriage at a young age is common (21% of girls are married before the age of 18), which put girls at high risk of abuse (Girls not Brides, 2020; Taylor & Michael, 2013, pp. 12–13), and the practice of bride-price is cited as a factor in perpetuating violence against women (Taylor & Michael, 2013, p. 12). National policy and law criminalizes gender-based violence, provides access to protection orders, and seeks to counter some traditional discriminatory practices and address gender inequalities (Taylor & Michael, 2013, p. 17), but nevertheless gender-based violence is high, widely accepted, and often considered to be a private matter to be resolved within families following traditional customs (Anderson et al., 2017, p. 119; Government of Vanuatu, 2015b, p. 103).

**There is limited evidence available about gender-based violence under emergency conditions in Vanuatu.** Worldwide, evidence shows that gender-based violence often increases following disasters, in all countries at all stages of development (Masson et al., 2016, p. 11). Assessment reports for disasters in Vanuatu have raised concerns and highlighted risks, but provide little robust evidence on the incidence of gender-based violence following disasters. Following two tropical cyclones in 2011, a counseling center on Tanna island reported more than a tripling in domestic violence cases (CARE, 2015, p. 8). Surveys of evacuees from Ambae island in 2017 found that between 10% and 35% of respondents had observed increases in domestic violence and child abuse (Gender & Protection Cluster, 2017b, p. 5, 2017c, p. 5, 2017a, p. 3). Following TC Pam in 2015, emergency shelter facilities on Emae and Tanna islands were noted to be often overcrowded and lacking privacy and

<sup>11</sup> Specifically, respondents agreed that a husband is justified in hitting or beating his wife for one or more of the following reasons: she burns the food, argues with him, goes out without telling him, neglects the children, or refuses to have sexual intercourse with him.

lighting, particularly around toilet facilities, which are identified as risk factors for sexual violence (CARE, 2015, p. 8; Government of Vanuatu, 2015b, p. 106), but no data on outcomes regarding gender-based violence following TC Pam could be located. A review of the Australian government's response to Cyclone Pam stated that "Vanuatu Women's Crisis Centre and communities reported that domestic violence had increased in the weeks and months following the cyclone," but no figures are given (Office of Development Effectiveness, 2017, p. 61).

**Natural hazards can disproportionately affect women's livelihoods by damaging natural resources that women rely on and because women's social roles can inhibit them from pursuing alternative income-earning activities.**

In Vanuatu, for example, making handicrafts is a major economic activity for women which was badly affected because of extensive damage to pandanus trees<sup>12</sup> (Government of Vanuatu, 2015b, p. 97; Morioka, 2016, p. 24). The government lifted a seasonal ban on sandalwood harvesting, a role taken by men, to stimulate the economy, but the damage to pandanus trees that affected women's livelihoods did not attract much attention because they were not officially regarded as an agricultural commodity (Morioka, 2016, p. 24). The loss of food crops was a double blow

to women, not only affecting households' own food supplies but also affecting women who prepared and sold food in markets, which is another major economic activity for women (Morioka, 2016, p. 24). The government's post-disaster needs assessment of TC Pam noted that women were more likely than men to be affected by the cyclone because of women's higher poverty levels, disproportionate share of family care work, and because women are often employed in low-skilled work (Government of Vanuatu, 2015b, pp. 94, 105). Women spend four times as many hours as men on unpaid household work (27.2 hours per week compared with 6.6 hours for men) during normal times<sup>13</sup>, and women's domestic and caring workloads increased dramatically following the cyclone (Government of Vanuatu, 2015b, p. 105). Following TC Pam, women tended to have high workloads, experience post-disaster emotional distress, have their voices filtered through male managers, have their finances controlled by husbands, and undertake stereotypical income-generating activities (Clissold et al., 2020, p. 108). Some authors also note that women played an important role in post-disaster recovery by sharing resources, helping each other across formal and informal social networks, and through diversification, adaptation, and entrepreneurialism (Clissold et al., 2020, p. 108).

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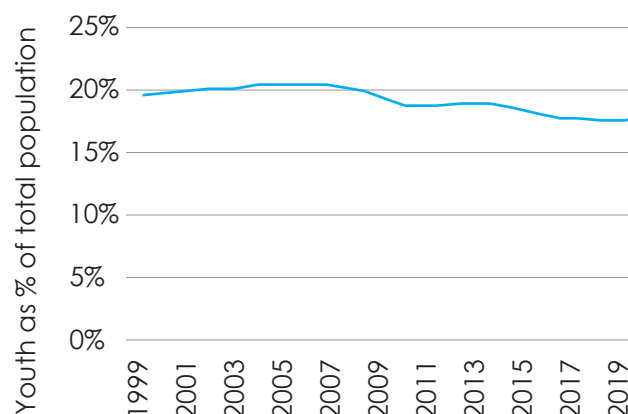
<sup>12</sup> A tree whose leaves are cut into strips and used for weaving baskets, mats, and other handicrafts.

<sup>13</sup> These figures are cited by multiple sources; they come from a study carried out in 2000 by Foundation of the People of South Pacific International: Whyte, J., S. Siwatibau, et al. (2000). Vanuatu Rural Time Use Survey.

## 2.8. Youth

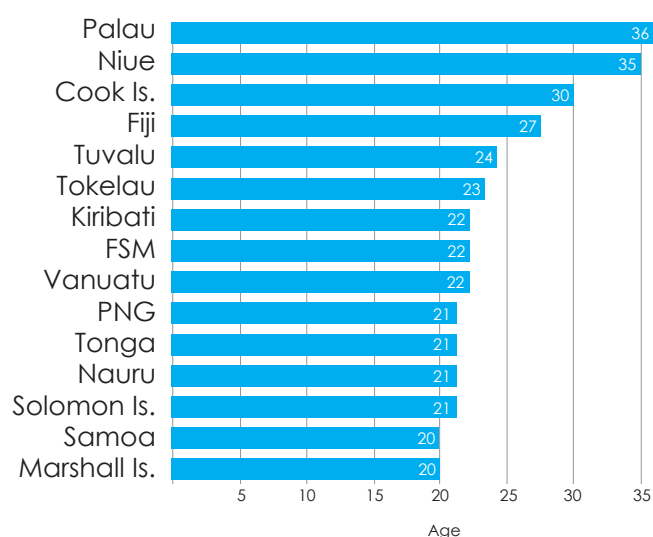
Countries across the Pacific region have young populations that are growing, marginalized, and experiencing challenges accessing quality education and employment. Across the region, youths aged 15-24 make up 19.7% of the population, compared with the global average of 15.5% (Clarke & Azzopardi, 2019, p. 6; United Nations Population Division, 2019). In Vanuatu, 18% of the population is between the ages of 15 and 24 years<sup>14</sup> (United Nations Population Division, 2019). Youth development is a major concern across the region, particularly in relation to educational quality and relevance, employment and entrepreneurship, health (particularly non-communicable diseases, sexual and reproductive health, and mental health), civic and political representation and participation, protection from abuse and exploitation, gender equality, and equality for young people with disabilities (Clarke & Azzopardi, 2019, pp. vi–viii; SPC [Secretariat of the Pacific Community], 2015, pp. 5–6, 18–19). There is, however, a general lack of statistical data disaggregated by age in areas such as education, health, and employment, which makes it difficult to identify priorities and evaluate progress (Clarke & Azzopardi, 2019, p. vi; SPC, 2015, pp. 6, 11). In Vanuatu, school enrolment rates are high at the primary school level, but most children do not go onto secondary school due to the limited number of places available, distances, and costs (Ireland, 2016, p. 26) and because many subsistence households rely on the labor of younger family members (Government of Vanuatu, 2015b, p. 88). Gross enrolment rates for primary school are 130% for males and 125% for females, and for secondary school are 44% for males and 50% for females (Ministry of Education and Training, 2020, p. 20). Only about 5% of the population goes on to tertiary education (SPC, 2015, p. 25).

**Figure 6: Vanuatu youth population (ages 15-24) as a percentage of total population**



(United Nations Population Division, 2019)

**Figure 7: Median ages for Pacific region countries**



(UNFPA, 2014, p. 100)

<sup>14</sup> Vanuatu also uses a national definition of youth that spans ages 15 to 29 years (Vanuatu National Statistics Office, 2017, p. 1).

### 2.8.1. Education

**Across the Pacific, evidence shows that natural hazards can disrupt education with long-term consequences for young people.**

In the Philippines, for example, one year after Typhoon Washi (2011), 23% of families in one of the most severely affected cities said their children had permanently dropped out of school (Barber, 2014, p. 11), and in Australia, research five years after the 'Black Saturday' bushfires in Victoria state (2009) found that children in some affected areas were suffering developmental delays of between one and five years (Hubbard, B., 2014, cited in Barber, 2014, p. 10). Disasters often exacerbate existing inequalities, notably gender inequality, and in many countries, girls are more likely than boys to be pulled out of school during crises, and many do not return (Barber, 2014, p. 11).

**In Vanuatu, cyclones have damaged schools and disrupted education provision, but very little evidence is available about the resulting outcomes for students.** A UNICEF report notes a lack of data on the impacts of disasters on school infrastructure and school attendance in Vanuatu, although noting that disasters have an impact in the form of reduced access to schools and school closures, and that "anecdotal evidence suggests that children in Vanuatu are often kept out of school in the aftermath of a natural disaster to help their families with clean-up activities" (Anderson et al., 2017, p. 64). The physical damage inflicted on schools for recent events is increasingly well documented, but there is a lack of information about the

impact on educational outcomes. TC Pam, for example, is reported to have damaged 64% of primary and secondary schools in affected areas, as well as damaging kindergartens and staff housing, affecting 34,614 students (Government of Vanuatu, 2015b, pp. 47–48). Many school facilities had been built to poor standards or not well maintained, including some built by local communities on limited budgets and not following building standards (Government of Vanuatu, 2015b, p. 46). Schools were typically closed for 10 to 30 days following the cyclone (Ireland, 2016, p. 28); those with minor damage resumed lessons within about two weeks, and all schools were operating within about two months (SPC, 2016, p. 41). However, some schools were still using tents as temporary facilities in late 2016, a year and a half after the cyclone (IMF, 2016, p. 69). Following disasters, children are more likely to drop out of school to support their family through agricultural or domestic work and because of reduced household income to pay for school fees, which is more likely to affect girls than boys because girls tend to take on more domestic responsibilities (Government of Vanuatu, 2015b, pp. 49–50). A UNICEF report suggests that damage caused by TC Pam in 2015 may have contributed to a reduction in primary school enrolment in 2015 (Anderson et al., 2017, p. 77) (the primary gross enrolment rate fell by nine percentage points, from 118% to 109%, between 2013 and 2015) (UNESCO, 2020).

### 2.8.2. Employment

**Across the Pacific region, youth employment and employability are significant concerns and there is evidence that youths are particularly vulnerable to the impacts of economic crises and natural hazards.** Many youths experience difficulty making the school-to-work transition, job opportunities in the formal economy are limited and economic growth is low, the number of youth reaching working age is large, and there is a mismatch between the skills taught

by education and training institutions and employers' needs (Clarke & Azzopardi, 2019, pp. 95–108; ILO, 2017a, p. 7). Across the region, youths are over-represented in the informal economy and more likely to be unemployed or in vulnerable work (ILO, 2019a, p. 12). They are disproportionately employed as temporary workers and in low-quality and low-skilled jobs; they are perceived to lack education, skills, and experience; and they lack the social networks,



job market information, and experience to find new work (Marcus & Gavrilovic, 2010, pp. 9–10). Official unemployment figures may understate youth unemployment as many youths drop out of the labor force and give up actively seeking work (ILO, 2017a, p. 7). In economic crises and as a result of severe weather events, young people are pushed into the informal sector, underemployment, deteriorating employment conditions, and lower earnings (Marcus & Gavrilovic, 2010, pp. 9–19). The effects of a crisis can be long-term, including depreciation of skills, failure to develop human capital, delayed transition to adulthood, permanently reduced employment prospects and incomes, and increased vulnerability of social exclusion (Marcus & Gavrilovic, 2010, pp. 9–19). Many young people are employed in an informal capacity in agriculture, tourism, and fisheries, which are particularly vulnerable to climate change and natural hazards (ILO, 2017b, p. 138).

**Vanuatu's labor market fails to provide sufficient employment opportunities for the majority of the population** (Government of Vanuatu, 2015b, p. 89). The formal economy produces fewer than 700 new jobs each year, and 3,500 to 5,000 young people join the labor force each year (Government of Vanuatu, 2015b, p. 89; ILO, 2017a, p. 7). The youth unemployment rate (8.8% overall, 8.5% for young men and 9.1% for young women) is twice the overall unemployment rate (4.4%) (ILO, 2017a, p. 6; World Bank, 2020c). However, the ILO cautions that official unemployment figures may understate youth unemployment, as many youths drop out of the labor force and give up actively seeking work (ILO, 2017a, p. 7). Youth employment tends to be informal and insecure (Anderson et al., 2017, p. 112). A UNICEF report warns that a lack of opportunities for adolescents and young people perpetuates cycles of poverty and has led to unhealthy behavior, such as drug and alcohol abuse, and mental health issues. (Anderson et al., 2017, p. 5).

**Very little information appears to be available specifically addressing the impacts of natural hazards on youth employment in Vanuatu.** The Government of Vanuatu's post-disaster needs assessment of TC Pam notes that youth are particularly vulnerable: "youth are generally the first to lose their jobs in times of economic contraction and the last to gain employment when the economy rebounds" (Government of Vanuatu, 2015b, p. 92). A UNICEF report cites exposure to natural hazards as one of the factors contributing to weak economic growth and a shortage of employment opportunities for youth in Vanuatu (Anderson et al., 2017, p. 112), but specific details of how natural hazards have affected employment, beyond generally inhibiting economic growth, do not appear to be available.

**It is often presumed that there is a link between youth unemployment and participation in crime and political violence, but there is little hard evidence of this.** There are suggestions in the literature that widespread youth unemployment leads to participation in insurgencies, extremism, and violent gangs, but this appears to be "based more on intuition and assumption than on evidence" (Cramer, 2015, p. 1). Research does not directly disprove such a link, but there is insufficient data to show clearly that a link exists, and studies suggest that more important drivers of instability include weak governance, corruption, injustice, discrimination, humiliation, leadership offered by armed groups, availability of weapons, drug use, dysfunctional family relationships, and experience of violence in a culture of acceptance of violence (Idris, 2016, pp. 2–4).

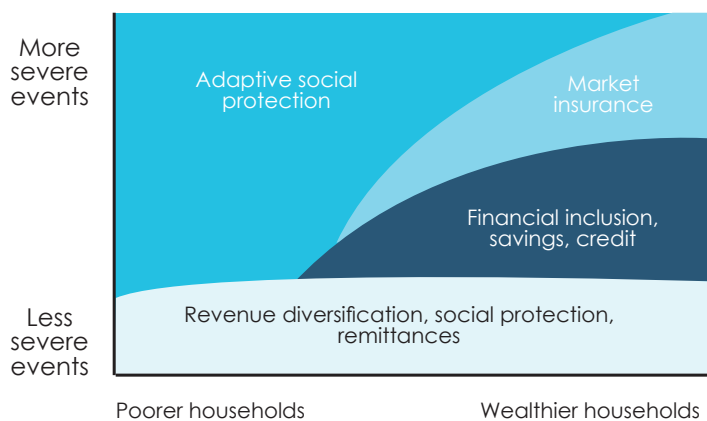
## 3.0. Coping mechanisms

### 3.1. Types of coping mechanisms

The Global Facility for Disaster Reduction and Recovery outlines four broad types of financial mechanisms for helping households cope with disaster risk (Hallegatte et al., 2017, pp. 11–13):

- **Revenue diversification** including cash transfers from social programs and remittances from family members abroad can help households at all wealth levels cope with relatively small shocks;
- **Adaptive social protection**, or scaling up social safety nets, can protect poor households against larger shocks if targeting and delivery are flexible and can respond quickly to need;
- **Financial inclusion** enables people to save in ways that are less vulnerable to hazards than property like livestock and housing, and enables them to access credit which can accelerate recovery and reconstruction, although poor people's own resources are likely to be insufficient for larger shocks; and
- **Market insurance** can protect against larger losses, but efforts to provide universal access to insurance face challenges of weak institutional and legal capacity, affordability, and high transaction costs, especially for the poor.

Figure 8: Financial coping mechanisms



(Hallegatte et al., 2016, p. 2017, pp. 11-13)

Two other disaster resilience mechanisms that are particularly relevant are:

**Migration**, including rural-urban migration, international migration, and the relocation of entire settlements, is also a widely used adaptation strategy in response to natural hazards and environmental change (Melde & Laczko, 2017, p. 85); and

**Community-based support** systems and strong traditions of informal social protection and resource-sharing, which are common across the Pacific (Hobbs & Jackson, 2016, p. 23).

### 3.2. Adaptive social protection

**Scaling up social protection schemes quickly by providing cash payments or vouchers to people affected by humanitarian crises is increasingly common worldwide** (Idris, 2017a, pp. 1–2; Save the Children and ACAPS, 2018, p. 12). Experience has shown that cash-based response is efficient and effective, enables recipients to identify and prioritize their own needs, supports dignity of recipients, can be more timely and flexible than other types of assistance, and supports the recovery of local

markets (Fabre, 2017, p. 3; Holt & Hart, 2019, p. 2; Save the Children and ACAPS, 2018, p. 12). Concerns about cash-based programming leading to risks of theft, diversion, corruption, security, targeting, misuse by beneficiaries, inflation, and disempowerment of women have not been shown to be significant in practice, and there is consensus that the risks of cash-based programming are no greater than those associated with in-kind assistance (Fabre, 2017, p. 9; Idris, 2017b).

**In the Pacific, cash-based programming has not been widely used until quite recently, but it is now becoming more accepted** (Hobbs & Jackson, 2016, p. 11; Save the Children and ACAPS, 2018, p. 12). Large-scale, in-kind distributions of aid have been preferred to cash transfers (Holt & Hart, 2019, p. 2), but lessons learned after TC Pam (2015) and TC Winston (2016) demonstrated some of the weaknesses of in-kind aid, including the challenges of dealing with unnecessary or inappropriate donations which delayed distribution of relief and imposed costs for storage and disposal. In Vanuatu following TC Pam, for example, donations of goods included food items, half of which were expired by the time they were accessed, as well as large quantities of clothes, shoes, bedding, and other items that were inappropriate for the local culture, living conditions, and climate. The processing and disposal of these items caused delays and congestion at the port and diverted time and money from disaster relief operations (WTO, 2019, pp. 33–34). Cash transfers in crisis situations are more feasible in countries with prior experience of cash transfers through social protection programs and remittances, and with well-developed financial services and a high degree of financial inclusion, although country-specific social, cultural, and gender-related issues also affect feasibility (Hobbs & Jackson, 2016, pp. 8–9).

**Vanuatu has limited activity in the area of social protection, and no existing large and scalable cash transfer programs.** Vanuatu's social protection programs are small and limited by regional standards, ranking second-last in the Pacific on the Asian Development Bank's Social Protection Indicator<sup>15</sup> (above only Papua New Guinea) (ADB, 2016, pp. 11–12). Social protection is a relatively new area of activity for Vanuatu (Costella & Ivaschenko, 2015, p. 37); there are no regular social transfer schemes, "the comprehensiveness and impact of Vanuatu's 'formal' social protection system appears quite weak" (Anderson et al., 2017, pp.

112–116), and there are no broad-based social protection programs apart from employment-linked pension schemes such as the Vanuatu National Provident Fund (Holt & Hart, 2019, p. 26). Four targeted social assistance programs existed as of 2012: a Home Island Passage Allowance scheme, details of which appear to be unavailable; scholarships for students; a Family Assistance Support Program providing short-term financial assistance to destitute families; and disaster assistance which consists of emergency supplies such as food, water, clothing, blankets, temporary shelter, and transportation services (Alatoa, 2012, pp. 6–9). Some small-scale cash transfer programs have been undertaken in the country, including:

- Following the evacuation of Ambae island in 2017 and 2018 due to volcanic activity, Oxfam led a cash transfer program to help displaced people buy goods from local markets (Nalau et al., 2020, p. 31).
- Following TC Pam, members of the national contributory pension scheme, the Vanuatu National Provident Fund, were permitted to withdraw up to 20% of their pension savings; 21,634 of the approximately 31,000 members of the pension scheme did so, releasing funds amounting to VUV 1.7 billion (approximately USD 15.6 million), equivalent to about 2.1% of GDP (Government of Vanuatu, 2015b, p. 24; IMF, 2016, p. 27; Vanuatu National Provident Fund, 2017, p. 13). The average amount withdrawn was VUV 78,600 (approximately USD 720) per person.
- Cash-for-work projects were also undertaken following TC Pam: Oxfam provided vouchers for agricultural inputs and managed a cash-for-work program in Port Villa for around 500 people to support debris removal and recovery activities (Hobbs & Jackson, 2016, p. 29), and UNDP provided a small-scale cash-for-work project for around 100 people in Port Villa and on Tanna island (Hobbs & Jackson, 2016, p. 29).

<sup>15</sup> ADB's Social Protection Indicator calculates countries' total expenditures on social protection divided by the number of intended beneficiaries, expressed as a percentage of GDP per capita (ADB, 2016, p. 4).

**Cash transfer programs may be feasible in some parts of Vanuatu, depending on local conditions on each island.** A 2016 survey by the Cash Learning Partnership showed that government and humanitarian respondents agreed that there was potential for increasing the use of cash transfers in emergency response in the most central islands, but that the majority of outer islands could not support cash transfers due to a lack of markets with sufficient capacity, a lack of knowledge and practical experience across the country, poor access to financial services, risk of fraud, poor coordination among implementing agencies, and the potential to undermine longer-term development programming (Hobbs & Jackson, 2016, p. 29). A follow-up study by Oxfam in 2019 agreed that cash transfer programs were feasible in some locations, but that the level of feasibility varies greatly across different islands with challenges including limited access to markets with necessary goods and capacity to meet surges in demand, limited

availability and capacity of financial services providers, questions about fairly distributing cash payments between male and female heads of households, targeting of assistance, requirements for formal identification of recipients, and robustness of communications networks to support electronic payment solutions (Holt & Hart, 2019, pp. 3–4). Oxfam and the financial technology firms Sempo and ConsenSys carried out a small-scale trial of a digital cash transfer system using electronic cards and cryptocurrency (blockchain) technology in a project called “UnBlocked Cash” in 2019, distributing VUV 966,443 (approximately USD 8,600) and involving 187 heads of households and 29 vendors in Port Vila over four weeks. The pilot project showed “modest cost savings and significant time savings” compared with other methods of distributing cash and vouchers, particularly in registering beneficiaries and simplifying identification requirements (Rust, 2019, pp. 4–5).

### 3.3 Remittances

**Remittances – money and goods sent by migrants back to their country of origin – are an important source of income for many low-income countries, both in normal times and following disasters** (Pairama & Le Dé, 2018, p. 331). Worldwide, remittances have been increasing in recent years and currently amount to more than three and a half times the total value of official development assistance, with unrecorded remittances sent through informal channels possibly even greater (Pairama & Le Dé, 2018, p. 332). Remittances tend to be more stable than other international financial flows, and are countercyclical, often increasing to compensate for income shocks in migrants’ home countries (Brown et al., 2014, p. 434). A study of remittances sent by migrants working in Italy to 107 developing countries found that even when negative shocks occur in both the source and recipient countries, remittances remain countercyclical with respect to the recipient country (Bettin et al., 2014). Remittances significantly increase following

disasters, contributing to reconstruction and substituting for local financial systems which are not able to provide local credit (Bettin & Zazzaro, 2018, pp. 481–482, 497). Remittances can also take the form of goods and commodities, but sending cash is often considered to be more useful than sending goods: in one study of migrants in New Zealand collecting goods to send to various Pacific islands in response to disasters, half of the donated goods were unusable or unnecessary, an experience which is supported by other studies (Pairama & Le Dé, 2018, p. 336). It is unclear how well remittances support disaster preparedness: some authors argue that there is good evidence that remittances have substantially contributed to welfare, increased consumption, and improved housing, and that there has been a shift in the use of remittances from consumption to investment where it is feasible to do so and opportunities exist (John Connell, 2015, p. 140) including one study that examined 98 countries and found that

remittances contribute significantly (Bettin & Zazzaro, 2018, pp. 491, 497), while other authors argue that remittances are more often spent on basic needs such as food than on investments in adaptive capacity (Melde & Laczko, 2017, p. 86; Pairama & Le Dé, 2018, pp. 340–341). Remittances contribute to macroeconomic stability following disasters, except in very few cases where they reach very high levels, in excess of 17% of GDP, where they can be destabilising by causing inflation and creating moral hazard (Ebeke & Combes, 2013).

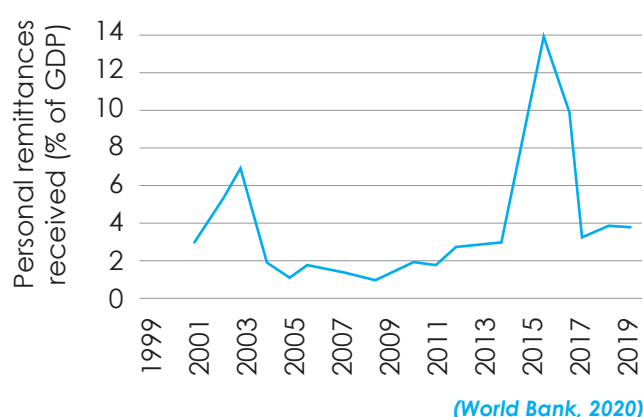
**Evidence from many countries worldwide shows that households that receive remittances are better able to respond to and recover from disasters than those that do not receive them, including rebuilding more quickly and avoiding negative coping strategies** (Bettin & Zazzaro, 2018, p. 483; Le Dé, Gaillard, & Friesen, 2015, p. 538).

Remittances help maintain consumption during crises and contribute positively to local economic activity (El-Zoghbi et al., 2017, p. 15). For example, in Samoa, remittances following a tsunami in 2009 and TC Evan in 2012 were used to rebuild housing, recover agricultural production, and rebuild community facilities (Le Dé, Gaillard, & Wardlow, 2015, p. 3). There is debate in the literature regarding the degree to which remittances contribute to reproducing existing inequalities: in the past, remittances have been more often received by middle- and upper-income families with better education and with funds to pay for transportation and visas, who can then invest further in these assets, but recent evidence suggests that migration has become cheaper and more accessible, and that remittances have contributed to reducing income inequality (John Connell, 2015, p. 139; Le Dé, Gaillard, & Wardlow, 2015, p. 2).

**International remittances are a small but increasingly important source of income for households in Vanuatu.** Amounts received have been gradually trending upwards over the past two decades, reaching 3.8% of GDP in 2019, with a significant surge in 2015 and 2016 following TC Pam (World Bank, 2020c). The Government of Vanuatu estimates that 15% of urban and 38% of rural households receive

remittances (Government of Vanuatu, 2015b, p. 89). A survey led by the Reserve Bank of Vanuatu and the Vanuatu National Statistics Office in 2016 estimated that 27% of adults had sent remittances, and 33% of adults had received remittances in the previous 12 months; most of the latter (72%) receive remittances from within Vanuatu rather than from overseas (Reserve Bank of Vanuatu, 2016a, p. 24). Most people (72%) report spending remittances on short-term personal expenses such as food and utility bills, 34% report spending on education costs, and smaller proportions report spending on housing, health, and other costs (Reserve Bank of Vanuatu, 2016a, p. 25).

**Figure 9: Remittances received in Vanuatu**



**There is good evidence globally and regionally that remittances provide resources that help recipients manage economic shocks, but there is a lack of information about exactly how remittances have been used for disaster relief and recovery in Vanuatu.** In 2015 following TC Pam, remittances spiked to five times the average of the previous 15 years (World Bank, 2020c), suggesting a significant overseas response to the disaster, but data on exactly how remittances are used during disasters do not appear to be available. This is generally true across the Pacific: most research on remittances has looked at their impacts on development, but very little work has been done on the role of remittances in disaster resilience (Campbell & Warrick, 2014, p. 31).

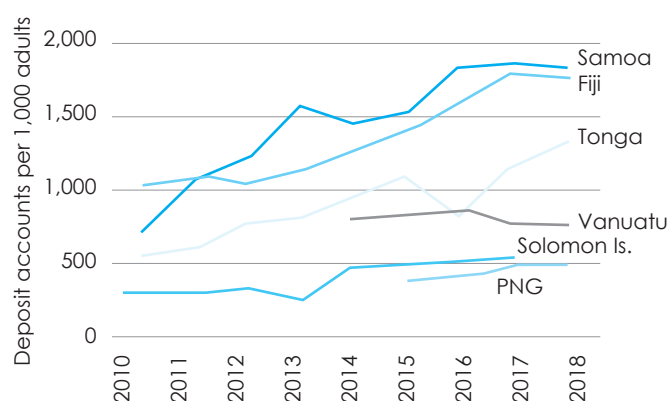


### 3.4. Financial inclusion

**Worldwide, financial inclusion is an important contributor to development, poverty reduction, and disaster resilience.** Access to financial services enables and incentivizes people to accumulate savings and smooth consumption over time, obtain loans, start businesses, receive remittances and other payments, obtain insurance, and improve resilience to financial shocks while reducing reliance on negative coping strategies and predatory lending (ESCAP [Economic and Social Commission for Asia and the Pacific], 2019, pp. 6–9). Evidence from multiple countries shows that financial inclusion contributes to poverty reduction and improving food security (Klapper et al., 2016, p. 2). Financial inclusion also helps poor people save in forms that are less vulnerable to natural hazards than physical property, and to preserve resources to help with recovery and reconstruction (Hallegatte et al., 2017, pp. 135–137). Evidence from villages in Thailand, for example, showed that financial inclusion was more helpful for smoothing consumption in the face of income shocks than financial support from relatives, at least when smaller sums of money were involved (Kinnan & Townsend, 2012, pp. 291–293). Evidence about the impacts of *microcredit*, however, shows little or no improvement to household welfare through lending to individuals, although better results are observed when lending to small businesses (Dimble & Mobarak, 2019; Klapper et al., 2016, p. 8).

**The level of financial inclusion in Vanuatu is similar to that of other Pacific island countries and other lower-middle-income countries** (Reserve Bank of Vanuatu, 2016a, pp. 1, 4). In Vanuatu, 37% of adults (32% of women and 41% of men) hold a commercial bank account, which is in the middle of the range for Pacific island countries and similar to the average of 42% for lower-middle-income countries worldwide (Reserve Bank of Vanuatu, 2016a, pp. 1–4). The proportion of people who reported saving money is 59% (65% of women and 53% of men), which is above the average for upper-middle-income countries worldwide, but most people use informal savings instruments, such as saving at home or through savings clubs, and only 21% report saving in a formal financial institution (Reserve Bank of Vanuatu, 2016a, pp. 16–18). Financial inclusion is higher in urban areas and among people with higher incomes; people living outside Port Vila and Luganville face long journeys to reach bank branches (Reserve Bank of Vanuatu, 2016a, pp. 8–12). Lack of identification is a barrier for many, as 27% of adults across the country do not have either formal identification or a birth certificate (Reserve Bank of Vanuatu, 2016a, p. 7). Use of other types of financial services is low, with 16% of adults borrowing from a bank, only 1% reported using a mobile money account to send money and 0.7% to receive money, and 5% having any type of insurance (Reserve Bank of Vanuatu, 2016a, pp. 27, 32–39). Cash is customarily used for most transactions: 100% of adults who work in agriculture and 69% of those who work in the private sector receive their income in cash (Hahm et al., 2019, pp. 19–20; Reserve Bank of Vanuatu, 2016a, p. 7; Rust, 2019, p. 10), and only 0.2% of MSMEs use electronic payments (Reserve Bank of Vanuatu, 2016b, p. 39). A survey of MSMEs found that only 8% use internet banking (25% of those in urban areas, but only 3% of those in rural areas) (Reserve Bank of Vanuatu, 2016b, pp. 39–40). Remittances (which are mostly sent within the country, rather than internationally) are most often sent through Western Union (55%) or

**Figure 10: Number of deposit accounts with commercial banks per 1,000 adults**



(IMF 2020)

hand-delivered in cash (21%) (Reserve Bank of Vanuatu, 2016a, pp. 24–25). Two mobile money service providers are operating as of 2019: ANZ GoMoney Pacific, a service of the Australian bank ANZ, and M-Vatu, operated by Telecom Vanuatu Limited in association with Vodafone Fiji; neither service supports international money transfers (Hahm et al., 2019, p. 16; Pacific Financial Inclusion Programme, 2019). Two microfinance organizations operate in the country: VANWODS Microfinance (Vanuatu Women Development Scheme),

a non-profit charitable organization offering various small-scale savings and loan products to individuals and small businesses (Reserve Bank of Vanuatu, 2016a, p. 2; VANWODS Microfinance, n.d.); and South Pacific Business Development Microfinance (SPBD), an international microfinance organization that operates in five countries, primarily working with women and supporting micro-enterprise development, savings, life insurance, and loans for education and housing (South Pacific Business Development, n.d.).

### 3.5. Insurance

**Worldwide, insurance is recognized as an important tool for managing risks associated with natural hazards** (Le Quesne et al., 2017, p. 11), **but the Pacific region is “one of the least insured regions in the world”** (Leith & Subramanian, 2013, p. 9). The insurance penetration rate<sup>16</sup> in the region is 3.6% (Leith & Subramanian, 2013, p. 9), which is well below the average of 8.9% in Organisation for Economic Co-operation and Development (OECD) countries (OECD, 2020). Barriers to uptake include affordability, inadequate disaster risk mitigation measures, insufficient baseline information for designing insurance products, limited availability of reinsurance, consumer awareness and cultural issues, lack of trust, inadequate building codes and certification mechanisms, lack of public asset registers, aid dependence, and weak mechanisms for distributing pay-outs (Lucas, 2015, pp. 4–5). There is both limited demand for and limited availability of insurance products in the region, and many communities have limited access to financial institutions (ADB, 2018, p. 18).

**In Vanuatu, the majority of people and businesses have no insurance coverage against natural hazards.** The non-life insurance penetration rate in Vanuatu was 2.1% in 2012 (PCRAFI, 2015, p. 32), which is below the

average for the Pacific region. Only 5% of adults have any kind of insurance, and this is mostly vehicle, health, or life cover; only 14% of people who do have insurance have coverage for their homes (Reserve Bank of Vanuatu, 2016a, pp. 27, 39). Nearly half (48%) of adults state that they do not know what insurance is (Reserve Bank of Vanuatu, 2016a, pp. 27, 39). Only 23% of MSMEs (58% in urban areas, 13% in rural areas) have any kind of insurance coverage (Reserve Bank of Vanuatu, 2016b, p. 42). Sources in the insurance industry estimate that 80% of clients are in Port Vila and the island of Efate, with 15% in Luganville and only 5% spread throughout the rest of the country (PCRAFI, 2015, p. 34); the government concurs that there is virtually no insurance in the outer islands, no insurance in the agriculture sector, and no insurance products designed for MSMEs (Government of Vanuatu, 2015b, pp. 26–27). Insurance against cyclone and earthquake damage is commercially available, but cyclone insurance is not automatically included in standard property coverage and is available only by extension, and only for properties with an engineer's certification of compliance with standards for cyclone wind loads (PCRAFI, 2015, pp. 31–34). Following TC Pam, “many business owners who had not procured cyclone insurance folded in the aftermath of the storm,

<sup>16</sup> An indicator of insurance industry development, calculated as the ratio of total insurance premiums to GDP.

unable to reinvest sufficient savings in their businesses or to tap sources of credit" (WTO, 2019, p. 31).

**The insurance market in Vanuatu is constrained by its small size and by the difficulty and cost of obtaining reinsurance coverage from the global market.**

The market currently includes three local insurance companies (QBE Insurance, VanCare Insurance, and Tower Insurance), two external insurance companies (Capital Insurance and Lloyds Australia), and several additional agents, brokers, and managers, all licensed and regulated by the Reserve Bank of Vanuatu (Reserve Bank of Vanuatu, 2020). The market has limited capacity and regulatory requirements and high premiums inhibit obtaining coverage from overseas insurers (PCRAFI, 2015, pp. 32–34). Insurance companies in Vanuatu have faced difficulties following recent disasters due to the scale of

losses suffered: after Cyclone Uma in 1987, five of the eight insurance companies operating at the time had to close, and after an earthquake in 2002, two of the five insurers operating had to close, in both cases due to difficulty obtaining adequate reinsurance coverage (PCRAFI, 2015, p. 37).

**Insurance may not be cost-effective for the poorest of the poor, and is not an appropriate approach for frequently recurring events or for slow-onset, highly predictable events**

(Germanwatch, 2020, pp. 18–19; Schaefer & Waters, 2016, pp. 50–51; Warner et al., 2012, p. 13). Microinsurance has generally been considered unsuitable for covering risks associated with natural hazards, which affect many people simultaneously, because of the large capital reserves required and the high cost of assessing claims (Ramachandran & Masood, 2019, p. 11).

## 3.6. Migration and relocation

**Globally and across the Pacific, migration both within a country and internationally is recognized as a positive adaptation strategy in response to natural hazards and environmental change**

(Melde & Laczko, 2017, p. 85). Voluntary, well-managed migration of individuals and communities can enhance the adaptive capacity of the migrant-sending community through the generation of remittances, reduced population pressures, and the transfer of knowledge and skills (Campbell & Warrick, 2014, p. 3). In one study of five countries around the world, migration in response to environmental change was linked to positive impacts on income and employment and a higher likelihood of adopting future preventive measures including using better building materials (Melde & Laczko, 2017, p. 86). The ILO reports that across the Pacific, labor migration has produced benefits including employment, remittances, and increased education and skills development, although some countries have also suffered from the loss of skilled workers where migration has been permanent rather than temporary or seasonal (ILO, 2019b, pp. vi–vii). However, studies consistently show that

there is psychological or political resistance to climate change-related migration, with many economic, social, cultural, and psychological costs associated with both internal and international relocation, including risks such as loss of tradition, language, identity, livelihoods and community cohesion (Campbell & Warrick, 2014, pp. 3, 24).

**Vanuatu does not have a history of overseas migration for economic opportunities, but numbers of temporary migrants, especially seasonal workers, are increasing.**

Vanuatu has historically had few migration outlets, but has been sending increasing numbers of temporary workers overseas since the launch of New Zealand's Recognised Seasonal Employer scheme in 2007 and Australia's Seasonal Worker Programme in 2012 (ILO, 2019b, pp. v, 2, 37). For example, Vanuatu's share of visas under the Australian Seasonal Worker Programme has increased from 8% in 2012–2013 to 40% in 2017–2018, amounting to 3,350 visas (Government of Vanuatu, 2015b, p. 89; Howes, 2018). Direct recruitment of workers for overseas employment is supported by the Vanuatu Department of

Labour, which maintains “a work-ready pool of workers” (ILO, 2019b, p. 31). Vanuatu's overseas diaspora is estimated at about 7,300 people or 2.5% of the population (IOM [International Organization for Migration], 2020), mostly in neighboring New Caledonia (ILO, 2019b, p. 21). A small-scale study of the effects of migration on food security in one village on Epi island found that migration reduced the availability of labor for agricultural production, and that remittances enabled and encouraged purchasing of food, including imported food, leading many households with migrant family members to abandon agriculture altogether and seek other income-earning opportunities (Craven & Gartaula, 2015). Rural-urban migration is a strong trend in Vanuatu, driven partly by environmental changes in places of origin, but also by people seeking jobs, education, health care, and other services (NDMO, 2018, p. 11).

**Relocation of settlements at extreme risk due to natural hazards is considered a last resort, with potentially severe social and cultural impacts.** Global experience with planned relocation of settlements has identified many risks, including landlessness, unemployment, homelessness, social marginalization, reduced access to common-property resources, food insecurity, increased morbidity, and community disarticulation (Cernea, 1997, cited in Campbell & Warrick, 2014, p. 24). Across the Pacific, particular risks relate to land, including loss of identity, culture, family ties and community, and conflict and governance issues around customary land rights (Boege, 2011; Campbell, 2010; cited in Campbell & Warrick, 2014, p. 24). In most cases, except perhaps where communities have directly experienced severe coastal erosion or flooding due to subsidence, residents typically resist the idea of relocation, and prefer in-place adaptation and sustainable management practices (Beyerl et al., 2018, p. 26; John Connell, 2012).

**In Vanuatu, several settlements have been relocated in response to natural hazards, and a national policy on relocation exists.** People in Vanuatu are generally reluctant to resettle except as a last resort, prefer in-situ adaptation measures, and are concerned with maintaining cultural and livelihood links should resettlement

occur (Perumal, 2018, p. 46). However, there are numerous examples of relocations taking place, including:

- Tegua island, 2005: a small coastal community of about 58 residents was relocated inland after suffering repeated flooding from high tides and cyclones, an earthquake, and a tsunami. The move was supported by strong traditional knowledge, belief systems, and local identity; strong social networks, collective action, and clear leadership; and availability of land and marine resources (Warrick, 2011).
- Mataso island, 2015: As a consequence of TC Pam in 2015, some communities were temporarily relocated, but lack of consultation with the community led to isolation and poor integration in the new locations (Perumal, 2018, pp. 54–55).
- Ambae island, 2017 and 2018: Eruptions of the volcano Manaro Voui led to the government evacuating the entire population of approximately 11,000 people to other islands for a month in 2017, and then again in mid-2018 for approximately six months; 4,178 people had returned to Ambae by mid-March 2019 (IDMC, 2018, p. 31; IOM, 2019; PCRAFI, 2018, pp. 2–5; Radio New Zealand, 2019; WTO, 2019, p. 27).

**In 2018, Vanuatu published a comprehensive policy on internal displacement, covering people who have been relocated or are at risk of relocation due to natural hazards or other reasons, as well as addressing people living in informal settlements and internal migrants.** The policy aims to minimize the drivers of displacement and relocation; minimize their negative impacts; work towards durable solutions for displaced populations; ensure that displaced people and host populations can make voluntary and informed choices and participate in planning solutions; facilitate well-managed and safe migration; promote access to disaster-resilient housing; and integrate human mobility into other sectoral policy areas (NDMO, 2018). Vanuatu (along with Fiji and Kiribati) is considered to be a leader in incorporating relocation, internally displaced peoples' rights, and cross-border movements into governance arrangements (IDMC, 2018, p. 29).

### 3.7. Community-based support

**Globally and in the Pacific region, community-based informal coping mechanisms are a common way to reduce risk in rural and poor communities** (Germanwatch, 2020, p. 5; UNDRR, 2019, p. 14). Community-based mechanisms rely on reciprocal exchange and trust in tight-knit social networks, and are well-suited to coping with relatively small-scale natural hazards that affect only a few community members at a time. Across the Pacific, strong extended family ties play a critical role in coping with disasters. (Fletcher et al., 2013,

p). 6). Pacific island countries tend to have “a strong tradition of informal social protection, with sharing of resources – in normal times and in times of emergency – common within families and the broader community, including sharing of cash or other items like food, clothing and tools” (Hobbs & Jackson, 2016, p. 23). However, community-based mechanisms can be overwhelmed by large-scale, long-term, or frequent events (Germanwatch, 2020, pp. 5–13).

**Table 3: Strengths and weaknesses of informal/ community-based risk-sharing arrangements**

Strengths	Challenges
<p><b>Adapted to local conditions:</b> Local knowledge of environmental conditions and understanding of needs, capacities and gaps</p> <p><b>Suitable for idiosyncratic risks</b> affecting a small number of individuals at a time</p> <p><b>Low transaction costs:</b> easier to determine the risk and impacts of shocks to a group member or household as well as the resulting needs</p> <p><b>Trust:</b> Emphasis on trust and reciprocity; strong relationships and extensive information-sharing in small communities lowers risk of fraud</p> <p><b>Affordability:</b> Flexible and affordable for the poorest members of the community</p>	<p><b>Suitability:</b> Traditional coping strategies are often only suitable for “familiar” and idiosyncratic natural events</p> <p><b>Traditional values and structures:</b> Not necessarily inclusive; may manifest and strengthen existing power structures</p> <p><b>Limited coverage of risks:</b> unable to deal with systemic risks that affect the whole community</p> <p><b>Put under stress by climate change:</b> increasingly frequent extreme weather events can push arrangements to their capacity limits</p> <p><b>Migration:</b> climate change can cause long-term migration of community members for work, which can lead to weakening ties, reducing trust, and weakening coping mechanisms</p>

(Germanwatch, 2020, p. 13)

**Vanuatu has a strong culture of community-based support, traditional knowledge, traditional governance systems, and faith-based organizations that all contribute to disaster resilience.** Vanuatu has long experience with natural hazards, and communities have well-established coping mechanisms for extreme weather events, which have been credited with contributing to the low

death toll resulting from TC Pam (Government of Vanuatu, 2015b, p. 37; Handmer & Iveson, 2017, p. 63). People in rural Vanuatu have a strong sense of community, high levels of social participation, and high levels of trust that helped maintain calm in the recovery period and supported collaborative work (Balaei et al., 2019, p. 715). One month after TC Pam, 72% of affected households reported that they had



completed repairs sufficient to meet their own perceived immediate needs, mostly without any external support (60%) or with support only from family and friends (24%) (REACH, 2015, p. 24). Some examples of communities undertaking preparation and recovery efforts on their own include:

- On the island of Erramango, the community disaster committee identified safe houses, organized an evacuation, and organized people to cut down trees in advance to avoid damage when they fell, and to store water. After the cyclone, the community committee conducted assessments, liaised with the relevant authorities, and cleared the airstrip so that relief supplies could be delivered, five days later (CARE, 2015, cited in Barber, 2018, p. 145).
- On Emae, people from three communities worked together to clear the coastal road of debris without any coordination from government (Jackson et al., 2017, p. 369).
- In urban areas on Efate island, residents reported mutual help between family members and at the neighborhood level included hosting those who lost their houses, sharing food and providing emotional support (Rey et al., 2017, p. 268).
- In the village of Laonkarai on Efate Island, where water supply systems were severely damaged, residents collaborated to share water resources within and between villages, repaired roofs and gutters, cleaned water catchments, removed obstacles, and fixed water pipes to restore creek-fed and rainwater-harvesting water supply systems using materials and equipment at hand (Balaei et al., 2019).

- A study of villages on the islands of Pele, Moso, and Tanna described how communities work together to move people to evacuation centres, help those who are in need, secure the houses, store water, collect and store breadfruit and bananas, preserve food, and cut down trees and trim leaves of plants to reduce storm damage (McNamara & Prasad, 2014, p. 127).

Local traditional governance structures provide leadership, coordination, and information during crises (Fletcher et al., 2013, p. 6). A study looking at one village on Tongariki island after TC Pam, for example, described how the village chief was central to coordinating and prioritizing reconstruction work, and in collecting food and money for those in greatest need (Jennings et al., 2020, pp. 32–33). Faith-based (predominantly Christian) organizations were also an important coping mechanism, with churches used as emergency shelters and church groups playing an important coordinating role in disaster response (Fletcher et al., 2013, p. 5). One study notes that self-reliance in remote rural communities can also mean that reconstruction efforts use locally-available materials that are not robust, and that progress can be slow: in one village recovering from TC Pam, most of the village was still rebuilding four years after the cyclone (Jennings et al., 2020, p. 34). Another study notes that traditional knowledge and cooperation systems may be in decline, with younger people being “more interested in modernity than tradition” and some traditional adaptations being lost while reliance on government, NGOs, and international aid increases (Handmer & Iveson, 2017, p. 63).

## 4. Conclusions

### 4.1. Hazard, exposure, and vulnerability

**Vanuatu is highly exposed to natural hazards, including tropical cyclones, earthquakes, volcanoes, tsunamis, and droughts.** The most damaging and regularly-occurring events are cyclones, which bring damaging winds, rains and storm surges (PCRAFI, 2011, p. 3). Vanuatu is also at risk of earthquakes and tsunamis (PCRAFI, 2011, p. 3), which are relatively rare but can be extremely damaging when they do occur, and of droughts, which are highly damaging because of the country's high dependence on subsistence agriculture. The country also has six active volcanoes, one of which has caused the evacuation of an entire island's population in 2017 and again in 2018 (WTO, 2019, p. 27).

**Vanuatu's relatively small economy, dominated by tourism and subsistence agriculture, is highly vulnerable to natural hazards.** Tourism is nature-based and highly dependent on coastal and inland ecosystems, which are vulnerable to damage from natural hazards, although even in the case of TC Pam, the industry suffered only short-term losses and was able to recover within a year (Eriksson et al., 2017, p. 52; WTO, 2019, p. 31). Agriculture is vulnerable to damage from cyclones and droughts, and the population of Vanuatu relies heavily on subsistence agriculture for livelihoods and food security (REACH, 2015, pp. 34–35).

**Natural hazards disproportionately affect poor people, workers in the informal economy, women, and youths.** Poor people tend to be more exposed to hazards than wealthier people, are more severely affected by hazards, and have fewer resources available to them to

cope when disasters do occur (Hallegatte et al., 2017, p. 4; ILO, 2019, p. 4; Wehrhahn et al., 2019, p. 60; World Bank, 2017a, p. 90). Poverty is a significant issue in Vanuatu, and the country has high levels of informal and vulnerable employment and subsistence economic activity (Government of Vanuatu, 2015b, pp. 88–89). Gender inequality is a significant challenge, and women and girls are often excluded from decision-making roles, limited in economic opportunities, and suffer high levels of gender-based violence (Anderson et al., 2017, p. 119; CARE, 2015, p. 3; Government of Vanuatu, 2015b, p. 103, 2015a, p. 26). Disasters affect women more severely than men because of women's higher poverty levels, disproportionate share of family care work, because women are often employed in low-skilled work, and because women often depend on locally-available natural resources, which can be damaged by disasters, for their livelihoods (Government of Vanuatu, 2015b, pp. 94, 105; Morioka, 2016, p. 24). Natural hazards damage schools and disrupt education (Anderson et al., 2017, p. 64; Government of Vanuatu, 2015b, pp. 47–48) but there is little evidence about the resulting impacts on educational outcomes. Vanuatu's youth suffer from a lack of employment opportunities and are vulnerable to insecure employment in times of crisis (Anderson et al., 2017, p. 112; Government of Vanuatu, 2015b, p. 92), but specific details of how natural hazards affect employment beyond generally inhibiting economic growth and causing short-term disruptions do not appear to be available.

## 4.2. Coping mechanisms

**Recovering from disasters can offer opportunities to not just repair damage and restore pre-existing conditions, but to “build back better” to improve future resilience if coping mechanisms are designed appropriately** (United Nations, 2015, para. 32).

The Global Facility for Disaster Reduction and Recovery (GFDRR), managed by the World Bank, identifies three important elements to building back better (Hallegatte et al., 2018):

- **Building back stronger** ensures that repaired and reconstructed assets are more robust and resilient, better adapted to current and future needs, and use the best available and most productive technologies.
- **Building back faster** restores assets and incomes of affected populations sooner, reduces cumulative losses, and reduces the resources needed to support affected populations through the recovery period. This requires recovery plans, agreements, financial arrangements, and materials to be put in place in advance of disasters occurring.
- **Building back more inclusively** ensures that post-disaster support reaches all affected population groups, including the poor and marginalized, and particularly including women and girls, who are the most vulnerable to natural hazards and who experience the most serious consequences when disasters strike. This requires the development of adaptive social safety nets that can react to shocks, with delivery mechanisms that cover vulnerable populations.

**Vanuatu has no social protection schemes suitable for rapidly scaling up to support disaster relief and recovery.** A UNICEF report argues that the lack of social protection and other social welfare services “limits the ability of the Government to lift vulnerable persons out of poverty and support economic growth” (Anderson et al., 2017, p. 5). A feasibility study by Oxfam concluded that cash transfer programs could be considered as part of a possible emergency response in some parts

of Vanuatu, depending on local capacities, but recommended that: training and pilot-testing should be undertaken to fill capacity gaps; policies for cash transfer amounts should be set appropriately to meet needs; research should explore how to most effectively assist groups disproportionately affected by disasters; procedures for assessing the capacities of markets should be established as part of initial needs assessments; financial service providers should be encouraged to extend services to rural and remote areas; systems for mass registration of recipients and establishing cash-out points should be established; and a gender and protection analysis should be undertaken (Holt & Hart, 2019, pp. 4–5).

**International remittances are a small, but growing, source of income for households in Vanuatu, but high costs and low labor migration rates inhibit the growth of remittances.**

The cost of sending remittances in the Pacific region is high by global standards, and many authorities have called for costs to be reduced, particularly during and after crises (Bettin et al., 2014, p. 17; John Connell, 2015, p. 143; Hahm et al., 2019, p. 24; Le Dé, Gaillard, Friesen, et al., 2015, p. 5; Melde & Laczko, 2017, p. 88). In Vanuatu, for example, the cost of sending USD 200 from New Zealand or Australia averages 11.3% to 12.0% of the remitted amount, compared with a global average of 6.7% (World Bank, 2020a, 2020b). Remittances require functioning financial and communications systems, so it should be a high priority to ensure that these systems are operational as soon as possible after a disaster (Ebeke & Combes, 2013, p. 2251; Le Dé, Gaillard, Friesen, et al., 2015, p. 4). Across the Pacific region, some authorities recommend offering training to migrants and to recipients of remittances to encourage greater use of remittances for longer-term investment, including encouraging recipients to deposit funds in financial institutions to accumulate savings (Ebeke & Combes, 2013, p. 2252; Jayaraman et al., 2011, p. 538; Le Dé, Gaillard, Friesen, et al., 2015, p. 6). Other

measures identified region-wide that can help support remittances in disaster situations include increasing migrants' access to financial services in host countries (Bettin et al., 2014, p. 17), ensuring that systems are in place to enable people to identify themselves, including temporary identification papers if needed (Le Dé, Gaillard, Friesen, et al., 2015, p. 5), and supporting tracing and contacting family members affected by disasters (Le Dé, Gaillard, Friesen, et al., 2015, p. 5).

**Vanuatu has a moderate level of financial inclusion by regional standards, but little experience using cash transfers to support disaster resilience.** Globally and across the Pacific region, various experts recommend continuing to promote greater access to and use of financial services including developing more access points, agent networks, digital payment platforms, and mobile money (El-Zoghbi et al., 2017, p. 27; ESCAP, 2019, p. 24; Klapper et al., 2016, p. 9). In the longer term, efforts could be made to increase financial literacy and awareness, especially among marginalized populations (ESCAP, 2019, p. 23); develop regulatory frameworks that accommodate poorer households and improve consumer protection to increase trust in the financial system (ESCAP, 2019, p. 23); and incentivize the private sector to develop financial services that are resilient in crisis environments (El-Zoghbi et al., 2017, p. 27). In Vanuatu specifically, ESCAP suggests that fostering cross-border mobile money services and improving mobile telephone network performance are key policy considerations (Hahm et al., 2019, p. 20), and recommend supporting the development of mobile money operators to reduce costs and increase convenience of domestic and international money transfers (Hahm et al., 2019, p. 22). A survey undertaken by the Cash Learning Partnership found that government and humanitarian respondents from Vanuatu felt that there was potential for using cash transfers in emergency response in the core islands but that most outlying islands lacked markets with sufficient capacity, and highlighted concerns included lack of knowledge and

practical experience implementing cash and voucher programs, poor access to financial services, risk of fraud, poor coordination among the organizations that would be involved, and a potential to undermine longer-term development programming (Hobbs & Jackson, 2016, p. 29). The Reserve Bank of Vanuatu suggests that financial services providers could explore ways to "improve the fit between their products and their clients' needs" (Reserve Bank of Vanuatu, 2016a, p. 30). Vanuatu's National Financial Inclusion Strategy aims to increase the number of active users of formal and semi-formal financial services and develop MSME financing products by: creating an enabling policy environment and financial infrastructure; promoting and fostering inclusive products, services and channels; supporting MSME financing; and strengthening financial literacy and consumer empowerment (Reserve Bank of Vanuatu, 2018, p. 23). The strategy notes that financial inclusion helps people mitigate shocks and manage expenses related to unexpected events including disasters (Reserve Bank of Vanuatu, 2018, p. 11), but does not recommend actions specifically aimed at improving disaster resilience.

**In Vanuatu, the majority of people and businesses currently have no insurance coverage against natural hazards, but the need to develop insurance products tailored to local conditions has been recognized.** Demand for insurance products could potentially be increased through public awareness and financial literacy campaigns (Schaefer & Waters, 2016, p. 99) and increasing access to financial services including developing channels such as mobile phones (ADB, 2018, p. 18). However, the poorest and most vulnerable people cannot afford insurance at market prices and may require some form of support (Schaefer & Waters, 2016, pp. 92–93). The insurance industry also requires support to develop new products tailored to local market conditions including improving the availability and use of local risk data (ADB, 2018, p. 18). Parametric or index-based insurance could potentially be simpler, more transparent, and cheaper than indemnity insurance, but

requires considerable technical capacity, data, communications capacity, and public awareness and education (ESCAP, 2015, pp. 17–19; Lucas, 2015, pp. 4–5). In Vanuatu specifically, the government “considers the absence of microinsurance a key market failure that should be addressed to facilitate private sector growth”, noting that the absence of suitable insurance products for MSMEs is a barrier to investment, and calls for studying potential designs for insurance products suitable for informal markets and for the establishment of a private microinsurance market in Vanuatu (Government of Vanuatu, 2015b, p. 27). The government also recognizes the need to improve and enforce building standards and practices and to work with small builders and professionals to ensure uptake of improved standards (Government of Vanuatu, 2015b, p. 40). Vanuatu’s National Financial Inclusion Strategy calls for the development of inclusive insurance products that meet the needs of the excluded population, including insurance for MSMEs and value chains in the agriculture, fisheries and tourism sectors (Reserve Bank of Vanuatu, 2018, p. 25).

**Vanuatu does not have a history of overseas migration for economic opportunities, but numbers of temporary migrants, especially seasonal workers, are increasing.** Globally and across the Pacific region, various authorities argue that migration should generally be supported and managed, and integrated into environmental, climate change, and urban planning policies (Campbell & Warrick, 2014, p. 30; Melde & Laczko, 2017, pp. 87–89, 93). There is a lack of knowledge about migration and climate change across the Pacific and a need for better information about international and internal migration trends, the economic and social characteristics of migrants and vulnerable populations, and the links among climate change, adaptation options, and migration policy, and gender implications are of particular

concern (Campbell & Warrick, 2014, p. 30; Melde & Laczko, 2017, pp. 89–92). Vanuatu has only a small diaspora and has historically had limited seasonal migration, although numbers of temporary workers are now increasing (ILO, 2019b, pp. v, 2, 37). The Vanuatu Department of Labour supports recruitment of workers for overseas employment by maintaining “a work-ready pool of workers” (ILO, 2019b, p. 31). The Vanuatu government is also working on harmonizing national qualifications with the Pacific Qualification Framework to facilitate migration of skilled workers (ILO, 2019b, p. 23).

**Relocation of settlements at extreme risk due to natural hazards is a sensitive undertaking, but several settlements in Vanuatu have been relocated in response to natural hazards and a comprehensive national policy on relocation exists.** Vanuatu is considered to be a leader in incorporating relocation, internally displaced peoples’ rights, and cross-border movements into governance arrangements (IDMC, 2018, p. 29).

**Vanuatu has a strong culture of community-based support, traditional knowledge, traditional governance systems, and faith-based organizations that all contribute to disaster resilience.** The government’s Climate Change and Disaster Risk Reduction Policy calls for working collaboratively with and strengthening the capacity of local (including provincial and community) groups, traditional governance systems, and faith-based organizations working on climate change and disaster risk reduction decision-making and implementation (Government of Vanuatu, 2015a, pp. 9, 18–19). The government recognizes traditional knowledge and practices in disaster resilience and aims to collect and record them, incorporate them into planning, make traditional knowledge accessible to decision-makers, and include traditional knowledge in school curricula (Government of Vanuatu, 2015a, p. 14).



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