

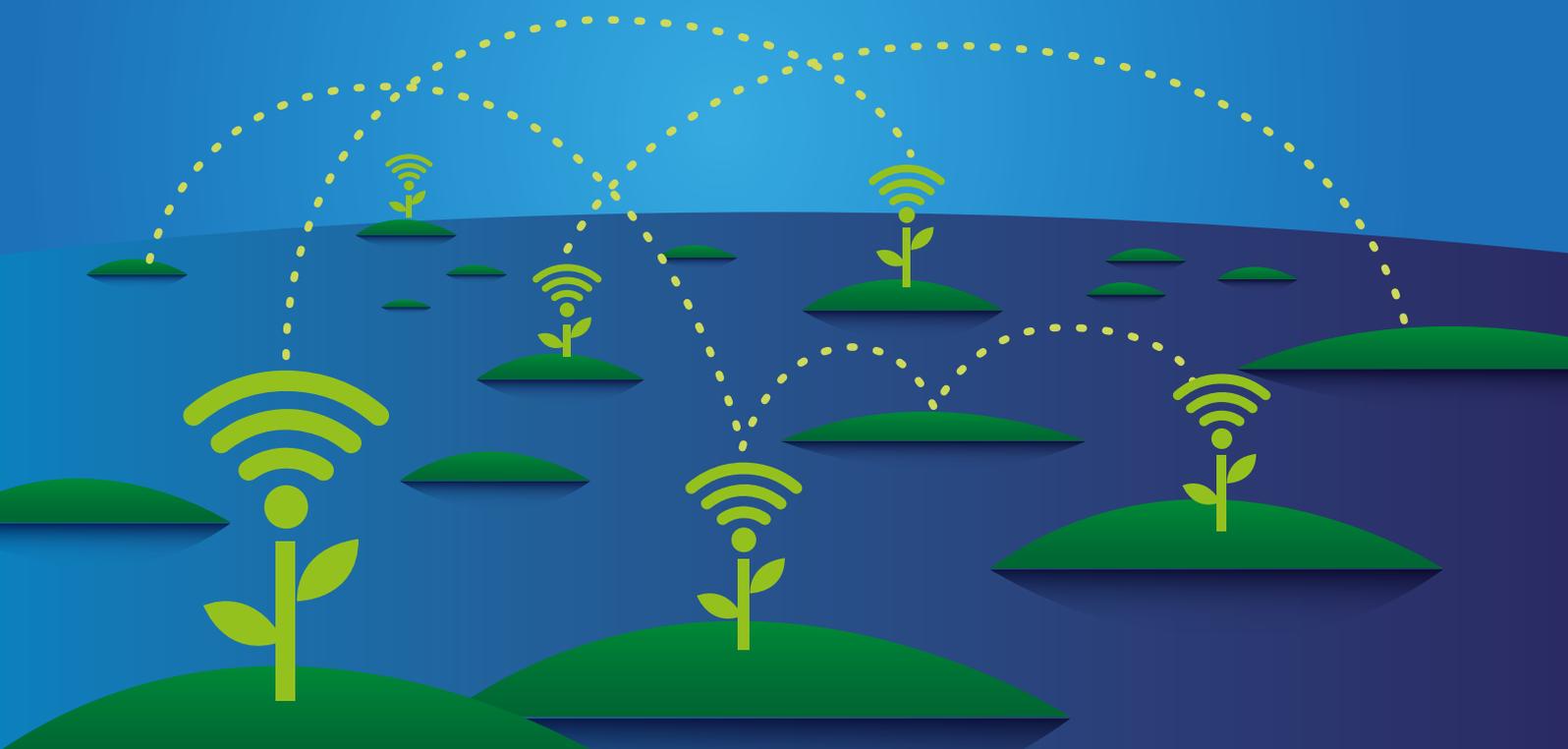


Food and Agriculture
Organization of the
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SIDS Solution Forum 2021

Gender, women and youth:
Implications for innovation
and digitalization Pacific

30-31 August 2021



SIDS Solution Forum 2021

Gender, women and youth: Implications for innovation and digitalization Pacific

This paper is focused on the Pacific SIDS (Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia (Federated States of), Nauru, Niue, Palau, Papua New Guinea (PNG), Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu) as well as the Maldives and Timor-Leste because of geographic proximity.

Summary

Bridging the youth and gender gap as it relates to digitalization and innovation could substantially contribute towards achieving the 2030 Agenda in the Pacific Small Island Developing States (SIDS). Acknowledging this need, the present paper seeks to analytically articulate the opportunities and challenges that are associated with the ability of youth and women, as both users of innovation and innovators, to optimize innovation and digitalization in the Pacific.

The paper starts by assessing the involvement of women and youth in agri-food systems in the Pacific SIDS and their capacity to adopt and devise digital and non-digital innovations. It then identifies the challenges that lead to substantial digital and innovation gaps that affect women and young farmers and entrepreneurs. Finally, the paper discusses ongoing and potential solutions for empowering women and youth as well as facilitating their engagement and participation in agri-food systems, particularly in the wake of the COVID-19 pandemic.

Introduction

1. The agri-food systems of the Pacific SIDS face specific economic, social and environmental challenges. Given their geographical isolation and limited arable land, they are generally dependent on food imports and, to a limited extent, on small-scale agriculture and fishery production.¹ This makes them vulnerable to external shocks, such as food price, supply volatility and the COVID-19 pandemic. SIDS are also facing a health crisis where undernutrition, micronutrient deficiencies and obesity coexist. Furthermore, they often lack the infrastructure and human capacities commonly found in larger countries, and their fragile ecosystems are especially at risk from the impacts of climate change. The high costs of energy, infrastructure, transportation and communication discourage the private sector from investing in stimulating domestic food production.²
2. To help address these issues, FAO is about to launch the SIDS Solutions Platform to enhance the exchange of information and solutions to accelerate the achievement of the Sustainable Development Goals (SDGs) related to agri-food systems, nutrition, health, the environment and climate change resilience in SIDS. The platform, which is being launched in the Pacific in 2021, will be gradually expanded to all other SIDS and feature a portal and a forum. The SIDS Solutions Portal will operate as an interactive knowledge exchange portal, specifically aimed at identifying, promoting and scaling up development solutions. The SIDS Solutions Forum will convene policymakers, private-sector leaders, development partners, local communities and academia to identify, discuss and prioritize local solutions to accelerate development.
3. The theme of the first biennial forum on 30 and 31 August 2021 is the identification of innovation and digitalization solutions to address the impacts of COVID-19 on the economy and to accelerate SDG delivery. In an increasingly connected world, digital transformation has the potential to enhance or undermine the competitiveness of the economy in general, and of the agri-food sector in particular, in Pacific SIDS. Overcoming digital connectivity issues across the Pacific has the potential to create 300 000 new jobs and increase gross domestic product (GDP) by more than USD 5 billion by 2040.³

¹ FAO. 2019. FAO's Work with Small Island Developing States. *Transforming food systems, sustaining small islands*. <http://www.fao.org/3/ca5170en/ca5170en.pdf>

² FAO. 2019. See note 1.

³ Asia Pacific Data for Development (APD4D) Initiative, Australian Aid and Catalpa. 2019. Empowering Pacific Women in Tech.

4. Yet, innovation and digitalization are neither gender- nor age- neutral. Rural women face greater constraints than men in accessing productive resources, services, technologies, markets, financial assets, employment opportunities and local institutions due to social norms as well as time and mobility constraints.⁴ The COVID-19 crisis has deepened these gender inequalities for both female farmers and agripreneurs.⁵ The pandemic is impacting Pacific men and women differently, exacerbating current asymmetries and risking a reversal of progress made towards closing the gender gap,⁶ including in innovation and digitalization.
5. The Pacific population is young,⁷ with more than half of the population under the age of 25.⁸ Youth in the Pacific SIDS face high unemployment⁹ and underemployment, limited access to resources, and insufficient participation in decision-making processes. The COVID-19 pandemic has made youth vulnerable to income and job loss, particularly those employed in the informal sector. It has also negatively impacted 92 percent of youth-led enterprises in Asia and the Pacific due to lockdowns, collapsing demands, broken supply chains and a credit crunch.¹⁰ As a result, more than half of these youth-led enterprises have experienced a decrease in sales and have had to partially or fully close at some point, while 21 percent have laid off staff or reduced staff hours or wages.¹¹

⁴ FAO. 2020 (a). *Gendered impacts of COVID-19 and equitable policy responses in agriculture, food security and Nutrition*. <http://www.fao.org/3/ca9198en/CA9198EN.pdf>

⁵ FAO. 2020 (a). See note 4.

⁶ United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). 2021. *The Future is Equal: Gender Equality in the Technology Industry* https://www.unescap.org/sites/default/d8files/knowledge-products/Report_Gender%20Equality%20in%20the%20Technology%20Industry_0.pdf

⁷ There are differences in national definitions of “youth” across Pacific SIDS. For example, PNG defines youth as the 15-30 age group, while the Cook Islands, Nauru, Niue and Palau define youth as the 15-34 age group.

⁸ The Pacific Community (SPC). 2015. *Pacific Youth Development Framework 2014-2023*.

⁹ Average youth unemployment rates in the Pacific are 23 percent. Secretariat of the Pacific Community. 2015. See note 8.

¹⁰ United Nations Development Programme (UNDP) and Youth Co:Lab. 2021. *How Young Entrepreneurs in Asia-Pacific Responded to COVID-19*. <https://www.undp.org/publications/how-young-entrepreneurs-asia-pacific-responded-covid-19>

¹¹ UNDP and Youth Co:Lab. 2021. See note 10.

6. This paper assesses the involvement of women and youth in agri-food systems in the Pacific SIDS, Maldives and Timor-Leste as well as their capacity to adopt digital and non-digital innovations. It identifies the challenges that lead to a substantial digital and innovation gap that affects women and young farmers and entrepreneurs, as well as ongoing and potential solutions for empowering them and facilitating their engagement and participation in agri-food systems. Bridging the gender and youth gap as it relates to digitalization and innovation could substantially contribute towards achieving the 2030 Agenda in SIDS. For example, at the global level, bringing online an additional 600 million women and girls could boost global GDP by USD 18 billion.¹² Bridging this gap is particularly important in countries like Fiji, which loses 20 percent of its GDP due to the gender gap.¹³

¹² <http://www.intel.com/shewill/>

¹³ Asian Development Bank (ADB). 2018. *Women and Business in the Pacific*.
<https://www.adb.org/sites/default/files/publication/445821/women-business-pacific.pdf>

Innovation and digitalization in agri-food systems across the Pacific SIDS

7. Innovations to agri-food systems in technologies, policies and institutions are critical for the Pacific SIDS to achieve the SDGs. This paper discusses two main types of innovations, namely digital and non-digital innovations. Digital innovations can be defined as the “fusion of advanced technologies and the integration of physical and digital systems, the predominance of innovative business models and new processes, and the creation of smart products and services”.¹⁴ To properly work and reach scale, digital innovations need to be delivered within a functioning business model and be increasingly mobile-based. Non-digital innovations encompass a range of solutions that can be technological in nature, such as physical innovations¹⁵ and advances in science,¹⁶ as well as innovations related to product, process, marketing and organizational practices.¹⁷
8. Agri-food systems in the Pacific SIDS are undergoing a digital transformation driven by changes in demand, technological factors, climate change and the COVID-19 pandemic, among other factors. All actors along the agricultural value chain, from farmers to agro-industries and retailers, are increasingly using digital solutions to generate, store and process data and turn them into insights to make their businesses more competitive and sustainable. Governments are also turning to information and communication technologies (ICTs) to deliver extension services, improve agricultural insurance programmes and monitor food security, among other needs.
9. Although the transformative effects of digitalization are already being felt in Pacific SIDS, this process has not fully picked up the pace yet, compared to China, the Southeast and South Asia.¹⁸ This is largely due to poor connectivity—the backbone of digitalization—in the Pacific Islands, despite significant investments in international bandwidth (submarine cable and satellite), domestic broadband access and cybersecurity awareness.¹⁹

¹⁴ European Environment Agency (EEA). 2020. Digital waste management. Eionet Report - ETC/WMGE 2020/4; p. 3.

¹⁵ FAO. 2021. *Scaling up inclusive innovations in food value chains in Asia and the Pacific*. Gálvez Nogales, E. Bangkok, FAO. Examples of physical innovations include autonomous and near-autonomous vehicles; advanced, smart robotics; additive manufacturing and multidimensional printing, including of food; and advanced materials and nanotechnologies.

¹⁶ Advances in science comprise next-generation biotechnologies (e.g. cellular agriculture and synthetic foods) and genomics, as well as energy creation, capture, storage and transmission. FAO, 2021. See note 15.

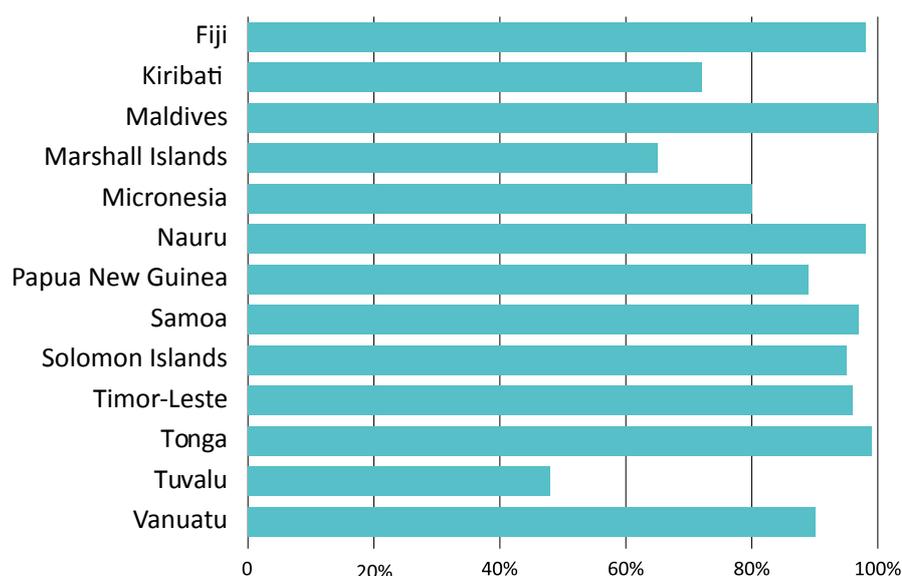
¹⁷ FAO. 2021. See note 16. Product innovation: changes or additions to goods produced or services delivered. Process innovation: changes to the way goods are produced or services are delivered. Marketing innovation: changes in the method or conditions for marketing the good, or changes in the placement or target of the good or service. Organizational innovation: changes in an organization’s structure, activities or services; in its processes or methods; or in its relationship with other stakeholders.

¹⁸ FAO. 2021. See note 15.

¹⁹ International Telecommunication Union (ITU). 2020. *The Report on the Implementation of Regional Initiatives by ITU from 2019 to 2020*. https://www.itu.int/en/ITU-D/Regional-Presence/AsiaPacific/Documents/Events/2020/RDF2020/RDF%20report%20ASP%20R1-an-is_.pdf

10. Fixed broadband penetration stands at less than 1 percent of the population and is often prohibitively expensive. Mobile Internet penetration across the islands was just 18 percent of the population in 2018, the lowest of any region. Similarly, only 38 percent of the population had subscribed to a mobile service, compared to 44 percent for least developed countries.²⁰ There are remarkable differences in terms of network coverage, mobile cellular subscriptions and Internet access. Network coverage (population covered by a mobile-cellular network) ranges from a high of 100 percent in the Maldives to a low of just 48 percent in Tuvalu (Figure 1). Internet penetration also ranges from 11 and 12 percent in Papua New Guinea (PNG) and the Solomon Islands, respectively, to 63 percent in the Maldives and Timor-Leste (Figure 3). Connectivity issues are worsened by poor access to affordable and reliable electricity, with access rates as low as 17 percent for rural dwellers in Vanuatu,²¹ and by the prohibitive cost of data in countries without a submarine cable.²²

Figure 1. Network coverage in Pacific SIDS, Maldives and Timor-Leste. This figure uses the latest data available. No data are available for the Cook Islands and Niue.



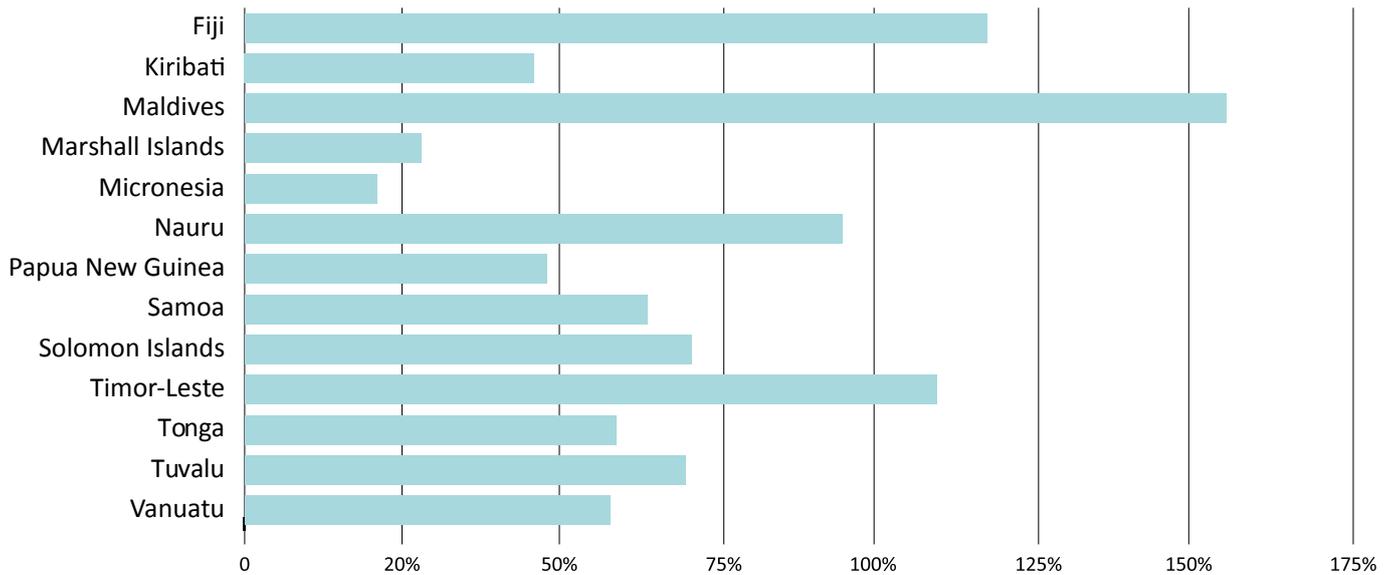
Source: <https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/Digital-Development.aspx>

²⁰ GSMA. 2019 (a). The Mobile Economy –Pacific Islands 2019. https://www.gsma.com/mobileeconomy/wp-content/uploads/2020/03/GSMA_MobileEconomy2020_Pacific_Islands.pdf

²¹ GSMA. 2019 (a). See note 20.

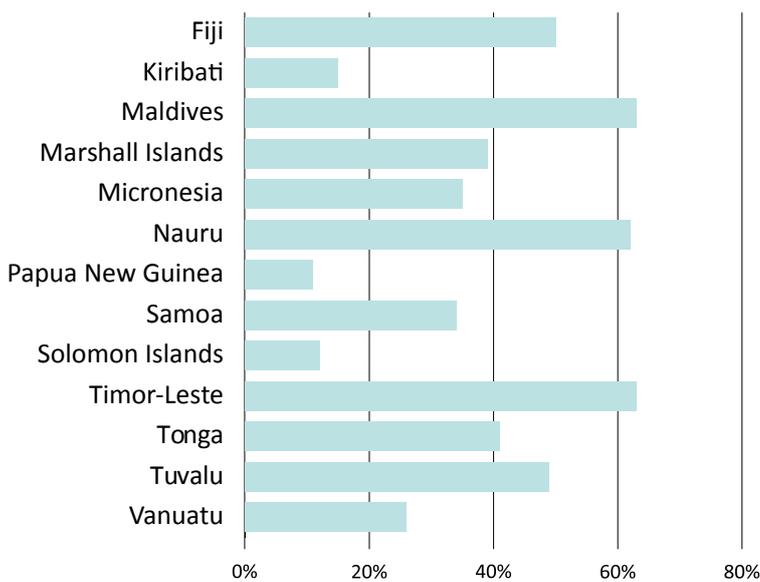
²² APD4D Initiative, Australian Aid and Catalpa. 2019. See note 3.

Figure 2. Mobile-cellular subscriptions in Pacific SIDS, Maldives and Timor-Leste. This figure shows mobile-cellular subscriptions per 100 habitants. This figure uses the latest data available. No data are available for the Cook Islands and Niue.



Source: <https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/Digital-Development.aspx>

Figure 3. Percentage of people using the Internet in Pacific SIDS, Maldives and Timor-Leste. This figure uses the latest data available. No data are available for the Cook Islands and Niue.



Source: <https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/Digital-Development.aspx>

11. Despite the above issues, there are four main areas where digital solutions are progressively introduced in food and agricultural value chains in the Pacific SIDS: e-commerce for agri-food products, online food delivery services, digital farming services for smallholder farmers, and financial technology (fintech) solutions for farmers and agri-food entrepreneurs.
12. While Asia has become the global leader in e-commerce and e-grocery,²³ the Pacific Islands have yet to take advantage of the potential of e-commerce in general, especially for the agri-food sector. E-commerce revenue is projected to reach USD 136 million in PNG and USD 62 million in Fiji in 2021, with user penetration rates estimated at 25.4 percent and 32.5 percent, respectively.²⁴ This nascent e-commerce activity is mostly related to the importation of consumer goods, tourism, banking and the entertainment industry, whereas the agri-food sector currently does not benefit much from e-commerce.²⁵ A key reason why agri e-commerce is not well developed is because electronic payment solutions are not yet widespread, which will be explained in more detail later in this paper. There are, however, some notable exceptions in some Pacific SIDS. For example, Vanuatu has seen a surge in e-commerce transactions by exporters of high-value agricultural products that do not need refrigeration, including essential oils, coconut-derived products and coffee. In the Solomon Islands, a number of companies within the fisheries sector are using buy/sell Facebook groups as an advertising mechanism for selling fresh catch.²⁶ Fiji and Samoa have recently launched e-commerce platforms—VitiKart and the Maua app, respectively—to buy and sell food, among many other items.

²³ FAO. 2021. See note 15.

²⁴ The penetration rate refers to the share of active paying customers (or accounts) from the total population of the selected market (market segment, region) for each year. <https://www.statista.com/outlook/dmo/ecommerce/fiji>; <https://www.statista.com/outlook/dmo/ecommerce/papua-new-guinea>

²⁵ United Nations Conference on Trade and Development (UNCTAD). 2019. *Kiribati/Tuvalu Rapid eTrade Readiness Assessment*; UNCTAD, 2018. *Solomon Islands/Vanuatu Rapid eTrade Readiness Assessment*.

²⁶ UNCTAD. 2018. See note 25.

13. Online food ordering and delivery platforms are providing new ways for restaurants and catering services to connect with Pacific Island consumers. However, the economic importance of delivering restaurant meals to the home in these countries is small,²⁷ as can be seen in Fiji and PNG, where user penetration in the online food delivery segment is estimated at only 2.9 percent and 0.9 percent, respectively, compared to 32.9 percent in Asia.²⁸ However, during COVID-19, Pacific SIDS have witnessed the launch of new online food delivery services and the growth of existing ones, including Cyber Food Fiji and Fiji Eats, Go Food PNG, and Seki Eats (Samoa).²⁹
14. Digital agriculture solutions can enable smallholder farmers to continue receiving farming advisory, acquire much-needed financing, receive inputs for their farms, and sell their products online or insure them. Digital agriculture can help Pacific Islanders overcome bottlenecks and make them more resilient to future shocks. For example, in Fiji, the PacFarmer App is a mobile-based digital platform that allows farmers to access information on government support schemes, commodity prices and weather information, as well as other features, such as market linkages with potential buyers, digital payments, credit and other financial services.³⁰ Another example is TraSeable, a digital platform for seafood and agriculture value chain stakeholders in Fiji to ensure product traceability and provenance.³¹ A third example is SkyEye Samoa, a tech startup that offers digital solutions that leverage geographic information systems (GIS) intelligence and geospatial and mobile technologies in Samoa, the Solomon Islands, Tonga and Vanuatu.³² For instance, SkyEye has conducted a drone-enabled coconut tree inventory for the not-for-profit Women in Business Development Inc. (WIBDI) in Samoa, which has supplied coconut oil and coconut products to clients in Australia, New Zealand and the United Kingdom for many years. The aerial survey counted 600 000 coconut trees in 558 farms and allowed WIBDI to estimate the ages of the trees and forecast the yield and production of coconut oil to ensure that supply matches demand. SkyEye Samoa also helped WIBDI digitize the organic certification forms that coconut producers use. In PNG in 2019, the Fresh Produce Development Agency launched the FARMIS app, a one-stop information portal with end-to-end solutions for farmers growing fresh produce. The services offered, such as market prices and weather and crop advisory services and input availability, can be tailored to farmers' needs in different locations and for various crops.³³

²⁷ FAO. 2021. See note 15; <https://www.statista.com/outlook/dmo/eservices/online-food-delivery/>

²⁸ <https://www.statista.com/outlook/dmo/eservices/online-food-delivery/>

²⁹ ITU. 2020. See note 19.

³⁰ <http://www.pfip.org/our-work/work-streams/financial-innovation/pacfarmer-app/>

³¹ <https://www.traseable.com/>

³² <https://skyeyepacific.com/>

³³ GSMA. 2019 (b). *Landscaping New Opportunities for Digital Agriculture in Papua New Guinea*. <https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/09/Landscaping-New-Opportunities-for-Digital-Agriculture-in-Papua-New-Guinea.pdf>

15. Financial technology, or fintech, providers are creating new market structures in underbanked developing countries by digging deeper into the financial services value chain and applying technologies, such as artificial intelligence, blockchain, cloud computing and the Internet of things. Farmers and agri-food entrepreneurs in Pacific Island countries could benefit from fintech solutions, such as mobile money, digital lending and insurance services, as well as digital peer-to-peer lending and crowdsourcing for farming and agri-food activities (i.e. connecting farmers and/or entrepreneurs with a crowd of small investors through digital platforms and storytelling techniques).³⁴ Nevertheless, the uptake of these solutions is rather low. The largest market segment is digital payments, with a total transaction value of USD 189 million in PNG and USD 87 million in Fiji, figures that pale in comparison with the value of digital payments made in Asia in 2021, amounting to USD 3.72 trillion, even when considered in per capita terms.³⁵ This goes to show that most people in the Pacific still use cash for most transactions, and alternative lending using ICT solutions is almost inexistent.³⁶ As the end of 2018, there were only nine live mobile money services available in the Pacific region: two in Fiji; three in PNG; and one each in Samoa, the Solomon Islands, Tonga and Vanuatu.³⁷ Although 80 percent of Fijians have heard of mobile money, only 6.5 percent have a mobile money account, and cash is generally preferred.³⁸ Securing donations through crowdfunding is being utilized in Samoa, while peer-to-peer funding is being used in PNG.³⁹

³⁴ FAO. 2021. See note 15.

³⁵ <https://www.statista.com/outlook/dmo/fintech>; Per capita transaction values are USD 795 in Asia, USD 96 in Fiji and USD 21 in PNG.

³⁶ International Monetary Fund (IMF). 2019. Strategy for Fintech Applications in the Pacific Island Countries. <https://www.imf.org/-/media/Files/Publications/DP/2019/English/sfapicea.ashx>

³⁷ GSMA. 2019 (a). See note 21. This study did not cover the Maldives and Timor-Leste.

³⁸ ADB. 2018. See note 13.

³⁹ ADB. 2018. See note 13.

16. Non-digital innovations identified in the Pacific SIDS are heterogeneous in nature and take place at all stages of the agri-food value chain. The following are some illustrative examples. Samoan processors, including Natural Foods, have developed a breadfruit flour that is high-quality and gluten-free, and a Samoan beer-maker has started to produce a special beer using local, pesticide-free breadfruit instead of importing commercially-grown barley.⁴⁰ In the Maldives, the startup Binheyo is helping urban citizens cope with the COVID-19 crisis by introducing micro-farming in urban spaces and helping them gain access to the tools and skills to grow and sell nutritious produce locally.⁴¹ In Timor-Leste, the startup Timor Mie has developed nutritious instant noodles that feature moringa, pumpkin and purple sweet potato, as an alternative to imported dry noodles.⁴² And the list goes on and on.
17. These innovations notwithstanding, the business environment in the Pacific Islands is not conducive to introducing non-digital innovations in the agri-food sector. The primary impediments to innovation in agriculture are the lack of land titling associated to customary land tenure, the remoteness and small size of the economy causing a high cost of operations, and limited human capital and significant brain drain. Moreover, economic wealth is rather concentrated, and the local business community is concerned with maintaining the status quo. All these elements translate into a lack of incentives for farmers and incumbent domestic firms to innovate.⁴³

⁴⁰ United Nations Industrial Development Organization (UNIDO). 2016. *Innovation in the Pacific: An Assessment*. <https://www.unido.org/api/opentext/documents/download/9927177/unido-file-9927177>

⁴¹ UNDP and Youth Co:Lab. 2021. See note 10.

⁴² <https://www.timorlestefoodlab.com/blog/2020/2/5/mie-marungi-healthy-instant-noodles-for-timor-lestenbsp>

⁴³ UNIDO. 2016. See note 40.

The gender and youth imbalance

18. In the Pacific, there is an innovation and digital divide influenced by gender and age group. The Global Gender Gap Index⁴⁴ 2021 of the World Economic Forum (WEF) ranks Pacific countries among the worst performers globally. The highest-ranked country is Timor-Leste (64 out of 156), followed by Fiji (113), while the Maldives, PNG and Vanuatu are in the bottom twenty-fifth percentile.⁴⁵ The Pacific Islands perform slightly better in terms of youth equality. According to the 2016 Global Youth Index, Samoa was the highest-ranked Pacific SIDS (50 out of 179), followed by the Maldives and Tonga, whereas other countries, such as Vanuatu and PNG, ranked much lower (113 and 126, respectively).⁴⁶
19. Several studies on entrepreneurship have pointed out inequality, on the basis of age and gender, as prevalent in the Pacific Islands. This affects women, young innovators and entrepreneurs, in both personal and professional contexts, from undermining their personal confidence to hindering their ability to innovate and access technologies, land, assets, credit and support services owing to discriminatory practices.⁴⁷
20. Pacific women often face a range of barriers that limit their participation in the digital and broader economy, as both users of innovations and innovators. Key barriers preventing women from innovating, adapting innovations and starting businesses, in addition to a general lack of digital capacity and literacy and of access to financial assets, are the lack of access to land and technology—including ICT—and not having a say in decision-making fora, such as local government councils and community-based organizations, that are critical for accessing digital and entrepreneurial opportunities.⁴⁸ In Vanuatu, for instance, women have no control over customary land, except through male family members, and are usually not allowed to have a voice in intra-community decision-making.⁴⁹

⁴⁴ The Global Gender Gap Index benchmarks the evolution of gender-based gaps among four key dimensions (economic participation and opportunity, educational attainment, health and survival, and political empowerment) and tracks progress towards closing these gaps over time. World Economic Forum (WEF). 2021. *Global Gender Gap Report 2021*. http://www3.weforum.org/docs/WEF_GGGR_2021.pdf

⁴⁵ WEF. 2021. See note 44.

⁴⁶ Commonwealth Secretariat. 2016. *Global Youth Development Index and Report 2016*.

⁴⁷ Scaling Frontier Innovation. 2020. *Mapping and Analysis of Entrepreneurial Ecosystems Incubators and Accelerators in the Asia-Pacific*. https://scalingfrontierinnovation.org/wp-content/uploads/2020/03/8_Frontier-Incubators_Entrepreneurial-Ecosystem-Mapping-Report-2019.pdf; and <https://www.pacific.undp.org/content/dam/fiji/docs/Entrepreneurship%20Innovation.pdf>

⁴⁸ FAO and SPC. 2019. *Country gender assessment of agriculture and the rural sector in Samoa*.

⁴⁹ FAO, 2020 (b). *Country Gender Assessment of Agriculture and the Rural Sector in Vanuatu*.

21. A significant divide persists between women and men in mobile phone ownership⁵⁰ and Internet access and use, particularly in rural and agricultural areas. The implications of this are far-reaching because when women have access to the Internet and the skills to use digital technologies, they have the opportunity to use virtual farming advisory services, buy inputs, sell agri-food products online and access financial services, among other things. Yet, 41 percent of women were using the Internet in the Asia-Pacific region, compared to 48 percent of men in 2019,⁵¹ and the gender parity score⁵² has increased slightly since 2013.⁵³
22. As there are limited gender- and age- disaggregated data on the above issues available for Pacific countries, it is not feasible to come up with accurate estimates. On one hand, the estimated usage figures for the Pacific SIDS are much lower and the gender gap may be higher, as tends to be the case in low-income countries.⁵⁴ On the other hand, in some countries, such as Tuvalu, sensitivity to gender equality is fairly present in all aspects of life, given that a majority of the male workforce is employed on merchant ships or as seasonal workers in Australia and New Zealand,⁵⁵ which may result in a much lower gender gap.
23. In terms of mobile ownership, the overall gender gap remains largely unchanged in low- and middle-income countries (LMICs) at around 8 percent, but the gender gap in mobile usage is even greater.⁵⁶ This is particularly true for mobile Internet, IP messaging (e.g. WhatsApp and Line) and other more sophisticated services. Affordability is the second biggest barrier to mobile ownership for both men and women in the Asia region, following literacy and digital skills.⁵⁷ Yet, for women in some countries, an additional impediment is the cultural barriers that they face. As a result, women are also less likely than men to acquire their own devices and even when connected, they often have inferior hardware (basic or feature phones instead of smartphones) than their male peers.

⁵⁰ Mobile is the primary way most Pacific Islanders access the Internet, but mobile access and use remains unequal.

⁵¹ ITU. 2020. *Measuring digital development Facts and figures 2020*. <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/FactsFigures2020.pdf>

⁵² The gender parity score is calculated as the proportion of women who use the Internet divided by the proportion of men. A value smaller than one indicates that men are more likely to use the Internet than women, while a value greater than one indicates the opposite. Values between 0.98 and 1.02 reflect gender parity. See ITU 2020, note 51.

⁵³ From 0.83 percent in 2013 up to 0.86 percent in 2019. See ITU 2020, note 51.

⁵⁴ GSMA, 2020. *The Mobile Gender Gap Report 2020*. <https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/05/GSMA-The-Mobile-Gender-Gap-Report-2020.pdf>

⁵⁵ UNCTAD. 2019. *Kiribati Rapid eTrade Readiness Assessment*.

⁵⁶ GSMA. 2020. See note 54.

⁵⁷ GSMA. 2020. See note 54.

24. Once women own smartphones, their mobile Internet awareness and use, mobile money adoption, and wider mobile use all more closely resemble rates for men.⁵⁸ When this happens, female farmers can access a digital farming advisory to increase their efficiency and resilience and e-commerce platforms to sell their products. Food e-commerce is also vital for cottage industries, which are typically female-led, and for women traders. As Pacific women have traditionally played an important role in agricultural marketing and petty trading,⁵⁹ as food e-commerce grows in the region, they run the risk of being crowded-out, should they fail to transition from physical to virtual shopfronts and omnichannel modalities. Besides Internet access, for women to participate in food e-commerce, they require access to dry and cold storage facilities and transportation services, coupled with skills development related to digital marketing, mobile payments, etc.⁶⁰
25. Another major barrier pertains to perceptions of women's "appropriate" roles, which hamper their capacity to access ICT solutions as well as innovate and build new businesses. Social and cultural attitudes can discriminate against women's access to technology and technology education. For example, it might be inappropriate for women to visit telecentres or cybercafés, or women might be reluctant to visit these places because they do not feel at ease due to various reasons, such as the location of these facilities or the types of customers who frequent these places. Cultural and social norms can also create mobility constraints for women, which make using telecentres or cybercafés more difficult for them, or even impossible.⁶¹ It is important to find a good location to ensure the attendance of women, such as a venue close to a market or a hospital, for example.

⁵⁸ GSMA. 2020. See note 54.

⁵⁹ ESCAP. 2014. *Putting Gender Equality centre stage in the Pacific*.

⁶⁰ FAO. 2021. See note 15.

⁶¹ FAO. 2018. *Gender and ICTs: Mainstreaming gender in the use of information and communication technologies (ICTs) for agriculture and rural development*. <http://www.fao.org/3/I8670EN/i8670en.pdf>

26. Rural women’s multiple roles and heavy domestic responsibilities limit the time they can allocate to learning about and using ICTs. Rural women tend to have a significantly heavier workload, and they are often in charge of fetching water, cooking, taking care of the children and cleaning, aside from the agricultural activities that they manage during the day.⁶² Rural women’s work burden and time poverty are also the result of discriminatory social norms that allocate roles and responsibilities unequally within the household, with domestic and care work still falling mainly on women’s shoulders. Women’s work burden should be reduced by enhancing their access to technologies, practices and infrastructure and by promoting an equitable distribution of responsibilities, including at the household level.⁶³ These gender gaps tend to be larger in rural areas or for certain age groups so that “the unconnected are disproportionately less educated, rural and female”.⁶⁴
27. These barriers translate into higher female engagement in informal activities where it is harder to innovate⁶⁵ and a 30 percent gender gap in participation rates in the workforce.⁶⁶ Wide disparities in male and female employment are evident in countries like Fiji, PNG, the Republic of Marshall Islands (RMI) and Samoa,⁶⁷ with the ratio being almost 2:1 in Samoa. It is also uncommon to find women in leadership positions. For example, women hold only 7 percent of positions on the boards of state-owned enterprises in Vanuatu and 19 percent in Samoa.⁶⁸ In addition, ICT jobs in agri-food and other sectors are dominated by men, the result of which is missed innovation and digitalization potential.⁶⁹

⁶² FAO. 2018. See note 60.

⁶³ FAO. 2020 (c). *FAO Policy on Gender Equality 2020 – 2030*. <http://www.fao.org/3/cb1583en/cb1583en.pdf>

⁶⁴ GSMA. 2020: p.14. See note 53. In Asia and the Pacific, the digital rural/urban divide is significant, whereby only 37 percent of rural households had access to the Internet in 2019, compared to 70.4 percent of urban households. ITU, 2021. *Digital trends in Asia and the Pacific 2021. Information and communication technology trends and developments in the Asia-Pacific region, 2017-2020*. <https://www.itu.int/en/myitu/Publications/2021/03/08/09/13/Digital-Trends-in-Asia-Pacific-2021>

⁶⁵ ESCAP. 2014. See note 59.

⁶⁶ Scaling Frontier Innovation. 2020. See note 47.

⁶⁷ https://www.ilo.org/asia/areas/WCMS_117542/lang--en/index.htm

⁶⁸ ADB, 2018. See note 13.

⁶⁹ APD4D Initiative, Australian Aid and Catalpa, 2019. See note 3.

28. Pacific youth face a real challenge to engage in entrepreneurial activity and work, as the labour markets are simply not producing enough jobs.⁷⁰ The gap between the number of labour force entrants and the number of new jobs is alarming in countries like Fiji, where 27 000 enter the labour force annually compared to only 600 new jobs created, or the Solomon Islands, with a 10 000: 400 ratio.⁷¹ Youth unemployment in the Pacific is estimated at 23 percent, and the situation is particularly dire in countries like RMI, Kiribati and the Solomon Islands, where close to half the population aged 15-24 is unemployed.⁷² Because of an income divide between rural communities and capital cities, many youth migrate from rural communities to participate in higher education or search for employment opportunities that often do not materialize. Although the rural Pacific has rich natural resources, young people are driven away from considering a farming job or business because of the lack of access to land and finance.⁷³
29. Young people with key digital competences and skills have the potential to be active participants and innovators in agri-food systems. The lack of disaggregated data by age group for Pacific SIDS prevents further analysis on youth access to Internet. However, some insights can be drawn from household-level surveys that find that the younger generation has more access to Internet and computers than older adults in Kiribati and Samoa.⁷⁴ Data related to youth access to Internet at the Asia-Pacific level also reveal that 70.3 percent of 15- to 24-year-olds used the Internet in 2019, a bit over the world average of 69 percent.⁷⁵

⁷⁰ International Labour Organization (ILO). 2017. *Improving Labour Market Outcomes in the Pacific: Policy challenges and priorities*.

⁷¹ ILO. 2017. *A Study on the Future of Work in the Pacific*.

⁷² <https://www.ilo.org/suva/areas-of-work/youth-emp-policy/lang--en/index.htm>;
https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-suva/documents/newsitem/wcms_181337.pdf

⁷³ Pacific Community. 2021. *Policy Review Farming the future- youth-inclusive agriculture policies, resourcing and programmes for a resilient Pacific*.

⁷⁴ UNICEF. 2021. Samoa Demographic and Health Survey (DHS)-Multiple Indicator Cluster Survey, <https://mics.unicef.org/surveys> ; <https://asiapacific.unfpa.org/en/publications/kiribati-social-development-indicator-survey-2018-19>

⁷⁵ ITU. 2021. See note 64.

Involvement of women and youth in the current solutions of innovation and digitalization in Pacific SIDS agri-food systems

30. Women and youth are currently involved in the current transformation of agri-food systems prompted by innovation and digitalization as both users and innovators. From the user perspective, there are fewer women than men in the Pacific Islands who are able to adopt digital and non-digital innovations in the context of food systems. More than 60 percent of Pacific women work in the agriculture sector, so it is essential to enhance their digitalization and innovation opportunities to generate income and close the gender gap. Digital technologies, for example, can reduce gender and age gaps by generating new opportunities for women and youth in smart agriculture, food e-commerce, online work and the sharing economy. There are multiple spaces, stakeholders and tools that contribute to expanding the access of women and men to these innovations, as shown hereunder.
31. Women and youth in the Pacific SIDS play a key role as innovators who develop or adapt the digital and non-digital innovations profiled in this paper. This is applicable to all type of solutions along the agri-food value chain, but in recent years, it has been most remarkable when it comes to digital innovations. Many examples of digital solutions mentioned earlier have been developed by young founders (e.g. TraSeable, SkyEye Samoa, Maua, Seki Eats and Fiji Eats) and to a lesser degree by female (co)founders (e.g. Maua and Timor Mie). Equally important are the spaces, programmes and tools to support these innovators across the Pacific Islands.
32. The COVID-19 pandemic has pushed female and young agripreneurs to innovate even faster. In response to the threats posed by COVID-19, 92 percent of young entrepreneurs in Asia and the Pacific have increased their use of mobile or digital solutions.⁷⁶ Their main digital innovation in response to COVID-19 has been to transfer marketing and sales to online channels by using social media or digital marketing (71 percent of enterprises) and increasing their use of e-commerce and e-payment channels or platforms (48 percent). Only 39 percent have increased their use of digital business-to-business solutions. In addition, 86 percent have launched new products and services and others have transformed their operating business models, or a combination of these strategies.⁷⁷

⁷⁶ UNDP and Youth Co:Lab. 2021. See note 10.

⁷⁷ UNDP and Youth Co:Lab. 2021. See note 10.

They mostly demand grants and in-kind resources, followed by technical advice related to digital solutions, marketing and trade intelligence.⁷⁸ Although no major differences have been observed between women-led and men-led enterprises in terms of innovations introduced,⁷⁹ female-led businesses are less confident that their business will survive the COVID-19 crisis (65 percent compared to 73 percent of male-led businesses), have received less government support (40 versus 45 percent), have found more barriers to taking initiative (56 versus 47 percent) and have incurred a higher rate of permanent closure (4 versus 0 percent).⁸⁰

33. Pacific Island innovators do not work in isolation. A survey about innovation conducted by the United Nations Industrial Development Organization (UNIDO) in 2016 among 150 firms from various sectors in five Pacific Island countries found that innovators habitually collaborated with other partners, herein listed in order of importance: government (38 percent of firms), other firms (32 percent), public research institutes and universities (20 percent), and private research institutes (10 percent).⁸¹ When innovators belong to disadvantaged groups, such as women and youth, this support is even more precious.
34. In the Pacific SIDS, multiple actors offer support and empower women and young entrepreneurs to innovate, often through multi-stakeholder partnerships. These actors include governments; the development community; large businesses; networks (e.g. chambers of commerce, professional and industry bodies, and business associations, particularly women's business associations); and civil service and non-governmental organizations, such as Oxfam, World Vision and Save the Children.
35. Some Pacific SIDS governments have launched entrepreneurship programmes targeting women and youth. For example, the Fijian Government launched an initiative in 2018 to empower young entrepreneurs through the Youth Entrepreneurship Scheme.⁸² However, the majority of governments in the region lack the resources to support farmers and entrepreneurs, let alone these vulnerable groups. A recent study on entrepreneurial ecosystems in Asia and the Pacific managed to identify 68 public and private providers of entrepreneurial support in the Pacific Islands, mostly coming from regional programmes and groups and some efforts from local chambers of commerce and business associations, rather than from government institutions.⁸³

⁷⁸ UNDP and Youth Co:Lab. 2021. See note 10.

⁷⁹ UNDP and Youth Co:Lab. 2021. See note 10.

⁸⁰ <https://pacifictradeinvest.com/media/1782/pti-pacific-business-monitor-wave-14.pdf>

⁸¹ UNIDO. 2016. See note 41.

⁸² GSMA. 2019 (a). See note 20.

⁸³ Scaling Frontier Innovation. 2020. See note 47.

36. Tech hubs and business incubators and accelerator programmes have become critical tools to promote innovation in agri-food systems across Pacific Islands. As of 2018, there were only six hubs operating in four Pacific Island countries, including Fiji and PNG.⁸⁴ In contrast, Asia’s digital ecosystems are growing exponentially, with 559 technology hubs, an increasing number of tech startups—including agritech firms—and a surge in financial capital injected into tech ventures.⁸⁵ This dearth of business incubation and acceleration ecosystem in the Pacific SIDS can be explained by a lack of economies of scale and the significant leverage of larger regional hubs in China, India, Singapore or Thailand that are dominated by the venture-backed and scale-at-all-cost models.⁸⁶
37. Nonetheless, over the past three years—even more so in light of the COVID-19 crisis—private-driven, international incubation and acceleration programmes have switched to virtual formats and have fitted their programmes to target Pacific startups. Several of them have specifically targeted women- and youth-led enterprises. One such case is Seedstars, which supports the development of the local entrepreneurial ecosystem in Fiji, PNG and Samoa and facilitates access to investment using a gender-lens approach.⁸⁷ In the 2019 and 2020 Seedstars events for the Pacific Islands, a majority of female founders from tech startups pitched business models that ranged from e-commerce and food delivery platforms to apps that enabled women-led households to cultivate and market mushrooms.⁸⁸ Similarly, the Australian not-for-profit social change incubator and accelerator programme ygap launched “yher Pacific Islands” in 2018 to support female entrepreneurs and female-led impact ventures across the region. Over the 2018-2020 period, yher supported 22 female ventures representing six Pacific Island countries in many fields, including agriculture and fisheries.⁸⁹ Another example is the Hub Pacific, an incubator that promotes access to digital skills among Samoa’s youth. It is a venue and virtual learning environment that facilitates digital events and online learning, and it helps incubate digital ideas into full-blown inclusive business solutions.

⁸⁴ GSMA, 2019. See note 20.

⁸⁵ Tech hubs can be defined as physical spaces designed to foster and support tech startups, including agritech startups. These include incubators, accelerators, co-working spaces, fab labs, makerspaces, hackerspaces, and other innovation centres. <https://www.gsma.com/mobilefordevelopment/blog-2/1000-tech-hubs-are-powering-ecosystems-in-asia-pacific-and-africa/>

⁸⁶ <https://www.pacific.undp.org/content/dam/fiji/docs/Entrepreneurship%20Innovation.pdf>; FAO. 2021. See note 15.

⁸⁷ Seedstars’ first global seed stage fund seeks to have over 30 percent of female-led companies in its investment portfolio; <https://www.seedstarsworld.com/>

⁸⁸ APD4D Initiative, Australian Aid and Catalpa. 2019. See note 3.

⁸⁹ <https://ygap.org/pacificislands/>

38. The donor community has also implemented several programmes specifically targeted at women entrepreneurs in the Pacific Islands, including in the agri-food sector.⁹⁰ Such efforts include those implemented by the United Nations (UN), the Asian Development Bank (ADB), the World Bank, the Department of Foreign Affairs and Trade (DFAT) of Australia, and New Zealand's Ministry of Foreign Affairs and Trade (MFAT). Specific examples range from Australia's Pacific Trade Invest (PTI) programme to DFAT's Pacific Readiness for Investment in Social Enterprise (Pacific RISE) and MFAT's Business Link Pacific (BLP). PTI develops and promotes businesses and people from the Pacific through trade, investment, tourism and labour mobility.⁹¹ Pacific RISE also facilitates investments in the Pacific aimed to deliver greater economic empowerment, particularly for women.⁹² Finally, BLP connects small- and medium-enterprises (SMEs) in Vanuatu, Fiji, Samoa, PNG, the Solomon Islands and Cook Islands to local advisory services, mainstreaming a gender equality and social inclusion approach.⁹³
39. UN initiatives that support youth and women farmers and agripreneurs are manifold. Such support is typically provided in the framework of programmes regarding digitalization and entrepreneurship and agri-food value chain development. For example, the United Nations Development Programme (UNDP) is implementing a project in Fiji concerning the use of digital financial services, such as the PacFarmer App, to improve women's access to different methods of doing business by enabling women's access to digital financial services and other information.⁹⁴ FAO's European Union (EU)-funded programme "Support to Rural Entrepreneurship, Investment and Trade in Papua New Guinea (STREIT PNG)"⁹⁵ is introducing gender-sensitive, labour-saving technological innovations for men and women involved at different nodes of the cocoa, vanilla and fisheries value chains, such as fish smoking devices, solar dryers for vanilla and energy-saving cooking stoves. STREIT PNG is implementing a gender- and youth-inclusion strategy that highlights the promotion of ICT tools/applications for better access among women and youth farmers and agripreneurs to agricultural information, markets and support services, including financial products and services such as mobile money.

⁹⁰ Scaling Frontier Innovation. 2020. See note 47.

⁹¹ <https://www.pacifictradeinvest.com/about/what-we-do>

⁹² <https://www.pacificrise.org/about/>

⁹³ <https://about.businesslinkpacific.com/>

⁹⁴ <https://www.unCDF.org/article/5790/empowering-women-with-technology-lessons-learnt-from-a-talanoa-dialogue>

⁹⁵ FAO is implementing the EU STREIT programme in collaboration with the ILO, ITU, UNCDF and UNDP and in close collaboration with the government and local partners.

40. Another example is the support provided by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the United Nations Capital Development Fund (UNCDF) to SkyEye in 2019 to develop MauaPay, Samoa's first interoperable e-payment system, which enhances the functionality of the Maua e-commerce app, among other things. The digitization of payments will allow Maua's women entrepreneurs to keep records, track their transaction history, increase their ability to receive a loan, increase working capital and expand their business.⁹⁶ The International Fund for Agricultural Development (IFAD), the EU, and the Technical Centre for Agricultural and Rural Cooperation (CTA) funded the Innov4AgPacific project, which organized the Pacific Agrihack Lab competition in 2018 to help young and women Pacific Islanders innovate. Two of the winners were innovative mobile applications in Fiji: TraSeable and My Kana. The latter application works by tracking dietary intake on a daily basis through a platform called "My meals," which creates specific recipes that are culturally familiar to the user. Another component called "My garden" includes information and step-by-step videos and information for home gardening.⁹⁷
41. Other key actors that play a critical role in supporting youth- and female- led enterprise development across the Pacific Islands, albeit through different mechanisms, are farmer and industry associations. For example, the Pacific Island Farmers Organisation Network (PIFON) is working with youth and women groups and helping them innovate to improve the productivity of farm enterprises, local processing and domestic marketing.⁹⁸ This support includes the introduction of new farming technology (e.g. equipment for pruning) or product development (flowers for the tourism industry, breadfruit, etc.). The support also includes diversifying into agritourism activities, as in the case of Talanoa, Fiji.⁹⁹ The Samoa Women's Association of Growers (SWAG) is encouraging its 50 members to adopt organic farming innovations for vanilla production and beekeeping, among other crops, sometimes complemented by ecological agritourism operations.¹⁰⁰ Another case is the Pacific Islands Private Sector Organisation (PIPSO), which organizes agribusiness fora, conferences and capacity building events for women entrepreneurs in the agribusiness and agritourism sectors.¹⁰¹

⁹⁶ <https://www.unescap.org/sites/default/files/Women-MSME-FinTech%20Innovation-Fund.pdf>

⁹⁷ <https://www.ifad.org/en/web/latest/-/boosting-food-security-in-the-pacific-with-innovative-technologies>

⁹⁸ www.pacificfarmers.com

⁹⁹ <https://pardi.pacificfarmers.com/opportunities/>

¹⁰⁰ https://digitalcollections.sit.edu/cgi/viewcontent.cgi?article=4225&context=isp_collection

¹⁰¹ www.pipso.org.fj

42. Women’s business networks are key to representing the interests and concerns of businesswomen in the Pacific, notably in Fiji, PNG, Samoa, the Solomon Islands and Tonga. Many of these networks, despite their small budgets and limited staff, have focused on providing business, digital and financial training to women. One such example is the Solomon Islands Women in Business Association, which has a large membership of women operating in both the formal and informal economies.¹⁰² In PNG, the Women’s Business Resource Centre (WBRC) is an entrepreneurial hub, which was established by the Center for International Private Enterprise¹⁰³ in 2016 with the aim of assisting women to establish and strengthen their businesses.¹⁰⁴ The WBRC has supported over 200 women to expand their businesses since 2018 and has trained close to 4 000 women in business and digital skills. In Samoa, WIBDI¹⁰⁵ manages a Certified Organic Grower Group comprising 750 women farmers and their families, and it specializes in supplying organic virgin coconut oil to the international retailer Body Shop. In 2018, WIBDI launched a “Farm to Table” app that helped link more than 1 300 small-scale farmers with hotels, restaurants, consumers and global retailers looking for locally-grown organic ingredients. As mentioned earlier, WIBDI has partnered with SkyEye Samoa to map coconut groves and count coconut trees from the air using drones¹⁰⁶ and to create the Maua e-commerce app, which aims to strengthen the link between Samoan farmers and the urban population to source and supply high-quality local produce.¹⁰⁷
43. There are also some initiatives that support innovation and entrepreneurship among youth. For example, the Vanuatu Young Entrepreneurs Council (VYEC) was established in 2016 to create awareness, offer training to young entrepreneurs and provide financial support. VYEC is supported by the International Labour Organization (ILO) and the Vanuatu Chamber of Commerce and Industry (VCCI). VYEC is also one of the few youth entrepreneurship councils in the region.¹⁰⁸

¹⁰² ADB. 2018. See note 13.

¹⁰³ The Center for International Private Enterprise is an independent, non-profit affiliate of the U.S. Chamber of Commerce. www.cipe.org

¹⁰⁴ <https://pacificwomen.org/stories-of-change/starting-or-growing-a-business-how-a-womens-business-resource-centre-can-help/>

¹⁰⁵ <https://www.womeninbusiness.ws/>

¹⁰⁶ <http://www.fao.org/asiapacific/perspectives/digital-villages/sids-dvi/en/>

¹⁰⁷ <https://pacificfarmers.com/women-in-business-development-inc-partners-with-sky-eye-to-strengthen-link-between-farmers-and-urban-population-in-response-to-covid-19/>

¹⁰⁸ Scaling Frontier Innovation. 2020. See note 47.

Findings and solutions

44. Pacific SIDS face many unique challenges, such as the limited size of individual markets, the cost of developing infrastructure between the archipelagos, the difficulty of formalizing a business,¹⁰⁹ high perceived environmental risks, and the inability to enforce contracts that appear to deter potential investors.¹¹⁰ As a result, their innovation and entrepreneurial ecosystems are very nascent, except in some countries. The bulk of agri-food system innovations, particularly digital ones, are concentrated in Fiji and Samoa, with some recent developments in PNG and Timor-Leste.
45. Even if the Pacific Islands are latecomers to the digital transformation process, their agri-food systems are witnessing the emergence of numerous digital applications concerning food e-commerce and meal delivery services, fintech solutions, and farming advisory services. There is also a wealth of non-digital innovations being introduced at all stages of the agri-food value chain and in different subsectors. However, not everyone is equally engaged nor benefits equally from the so-called digital revolution. Women and young farmers and agripreneurs are both innovators and users of digital and non-digital innovations. However, many studies indicate that despite the lack of disaggregated gender and age data, there are significant digital gaps concerning women and youth in agri-food systems. The COVID-19 crisis has further brought these inequalities to the spotlight.
46. The present paper has profiled several innovations—both digital and non-digital—by and for women and youth. It has also established that agripreneurs and innovators in the Pacific SIDS need tailored support to thrive, as do female farmers, who habitually encounter issues triggered by gender inequality, such as inequitable access to and control over natural resources, gender-based violence, low levels of participation in decision-making fora, and limited access to education and training. All these issues hamper their socio-economic development and can limit their access to and use of ICT programmes as well as innovation and entrepreneurial opportunities. Addressing these bottlenecks requires both general and targeted solutions.

¹⁰⁹ The World Bank's Ease of Doing Business ranking places the Pacific among the hardest places in the world: <https://www.doingbusiness.org/en/rankings>. In Fiji, starting a business costs 16.9 percent of annual income.

¹¹⁰ <https://www.pacific.undp.org/content/dam/fiji/docs/Entrepreneurship%20Innovation.pdf>; FAO. 2021. See note 16.

47. One of the first steps towards reducing gender and youth disparity is to provide Internet for all. Both governments and corporations are responding to the connectivity challenge in the Pacific islands, particularly in the wake of the COVID-19 pandemic. Some governments have sought to expand network coverage and capacity in the short term, particularly for broadband. For example, to enhance connectivity, the Government of Tuvalu has installed satellite dishes in all its outer islands.¹¹¹ The International Telecommunication Union (ITU) is currently adapting its smart/digital village template to Vanuatu and “smart islands” in general. ITU is also developing a pilot programme based on requests from Fiji and PNG.¹¹² Investments in infrastructure should be increased to promote network coverage. Governments can provide incentives for private-sector investments, for example through deregulations and tax incentives.
48. Yet, gender and youth inequality do not automatically disappear with growth and development, imposing high costs on women and girls and youth, as well as on societies more broadly. More targeted efforts are needed to enhance the access of women and youth to mobile phones and the Internet and to digital literacy training to enable them to use farming advisory services, mobile payment and credit, and digital marketplaces.¹¹³ In addition, promoting women’s adoption of efficient and socially acceptable technologies and practices is an important part of the solution to reduce women’s work burden. These technologies—from the simplest tools to more sophisticated digital solutions—need to be designed and disseminated to reduce the burden of rural women’s agricultural work and that associated with their household responsibilities. Engaging with rural institutions and organizations to raise their awareness of such gender discrimination and to overcome their implicit and explicit gender biases is a key first step towards ensuring that women’s work burden is effectively recognized, documented and addressed through informed technology-related policies and strategies.¹¹⁴
49. Business efforts can be made to make mobile phones more affordable, for example through innovations in subscription policies¹¹⁵ and business models to facilitate the access of resource-limited women and youth to mobile phones. Microfinancing institutes and banks and companies providing similar services can also develop a new business in making smartphones accessible for many, especially among women and youth, by developing financial products for mobile phones.

¹¹¹ UN. 2021. COVID-19 and E-commerce a Global Review.
https://unctad.org/system/files/official-document/dt1stict2020d13_en_0.pdf

¹¹² ITU. 2021. See note 64.

¹¹³ FAO. 2020 (a). See note 4.

¹¹⁴ FAO. 2020 (c). See note 63.

¹¹⁵ For example, in the early stages when smartphones were first introduced in Japan, SoftBank and other mobile phone operators provided mobile phone devices almost for free, with some conditions, such as having a long-term subscription contract.

50. Pacific SIDS also need to create more opportunities for young people aged 15 to 24 to follow clear pathways from education to productive employment and entrepreneurship, with subsequent impacts on their ability to innovate and participate in the digital transformation of agri-food systems. This first requires better coordination between education providers and the private sector. There are opportunities to support women specifically as part of this process as they struggle to transition from ICT education to employment and entrepreneurship.¹¹⁶ Efforts to increase the focus on technological readiness in education may help young and female entrepreneurs find opportunities in e-commerce and agritech ventures.
51. In addition, it is essential to consistently put in place appropriate public policy to promote gender and youth equality and to empower women and youth to innovate and enter the digital economy.¹¹⁷ In this context, efforts to increase the access and use of ICT solutions among women and youth need to be coupled with concrete actions to address the root causes of inequality and discrimination in Pacific SIDS. When women do not have a voice and influence in society, their access to technology and, broadly speaking, development opportunities will always be limited. Consequently, promoting the increased use of and access to ICT solutions and non-digital innovations by women, government, development agencies and the private sector can take a series of actions to address gender discrimination and inequality. These actions include the following: i) fostering the participation of rural women in decision-making through dialogue and collaboration with customary institutions, including a review of gender-biased norms and practices; ii) adopting strategies to support women's representation in local and national institutions and in natural resource governance mechanisms; iii) supporting rural women's groups to increase their bargaining power to access financial resources, technology, markets and land as well as improve their business skills;¹¹⁸ and iv) reinforcing programmes targeting rural areas to raise awareness on the negative effects of discriminatory stereotypes and harmful practices affecting women's enjoyment of their human rights.¹¹⁹ Similar actions are equally valid for fighting youth inequalities. Women and youth can also be seen as un-tapped business actors, and thus could be a business source in the market.

¹¹⁶ APD4D Initiative, Australian Aid and Catalpa, 2019. See note 3.

¹¹⁷ World Bank. 2012. *Toward Gender Equality in East Asia and the Pacific: A Companion to the World Development Report*.

¹¹⁸ FAO and SPC. 2019. *Country gender assessment of agriculture and the rural sector in Fiji*.

¹¹⁹ FAO. 2019. *Country gender assessment of agriculture and the rural sector in Papua New Guinea*.

52. To close the digital gender and age gaps, the following success factors need to be linked to the principles of digital development: content; capacity development; gender/youth and diversity; access and participation; partnerships; technologies; and economic, social and environmental sustainability. Furthermore, ICT and non-digital technologies should be accessible, affordable, easily usable, safe and relevant. Further research and analyses are needed to ensure that women and youth really benefit from innovations and digitalization programmes that do not widen the existing gender and age gaps. The collection of sex- and age- disaggregated data on the participation of women and youth in the digital society at local, national and international levels is also crucial. Sex- and age- disaggregated data on education and income, as well as on attitudes towards technology use and entrepreneurship, should be collected to help identify the most appropriate digital and non-digital innovations.¹²⁰
53. The Pacific SIDS are absent from many international rankings about the topics concerning innovation, digitalization and entrepreneurship, including the Global Innovation Index that covers 131 countries and is elaborated by Cornell University, INSEAD¹²¹ and the World Intellectual Property Organization (WIPO),¹²² or the Mastercard Index of Women Entrepreneurs.¹²³ ILO also reports a shortage of comparative data on Pacific labour markets and varying definitions of employment and unemployment, which makes it difficult to analyse and compare labour market trends across the region as well as assess the particular situation of women and youth.¹²⁴
54. Digital strategies should be gender- and youth- sensitive and participatory. Governments are expected to establish policies and mechanisms to ensure men's and women's effective access to and participation in information society. This should include access to information and the use of ICTs at a reasonable cost for all. The involvement of women and youth in ICT and innovation policy-making and implementation at national, regional and international levels needs to be reinforced. In this context, proactive initiatives include creating fora and digital platforms to engage and connect youth and women and learn about their viewpoints and innovative solutions. These initiatives can also launch internship and professional programmes that foster the participation of women and youth in the digitalization of agri-food systems.

¹²⁰ FAO. 2018. See note 61.

¹²¹ Institut européen d'administration des affaires

¹²² <https://www.globalinnovationindex.org/analysis-indicator>

¹²³ <https://www.mastercard.com/news/research-reports/2020/mastercard-index-of-women-entrepreneurs-2020/>

¹²⁴ <https://www.ilo.org/suva/areas-of-work/employment-promotion/lang--en/index.htm>

55. Redoubled efforts are also required by all stakeholders to provide targeted support to women and young agripreneurs. More programmes that focus on mentoring women and youth in the digital economy and introducing non-digital creative solutions are needed across the Pacific Islands, particularly in those with less-developed entrepreneurial and innovation ecosystems. These programmes may include the following:
- Launching youth/women, digital skills and capacity-building programmes as well as innovation challenges or competitions targeting these two groups to find innovative ICT solutions to address challenges facing agri-food systems.
 - Incentivizing young and female agripreneurs through tax concessions, simplified and flexible business registration procedures, and preferential access to public procurement processes.
 - Rolling out youth and female leadership programmes whereby young and/or female tech- and agripreneurs become leaders who communicate, promote and organize youth and women empowerment programmes, campaigns and initiatives regarding innovation, digitalization and entrepreneurship at the domestic and regional levels.¹²⁵
 - Devising strategies to link remittances, which are of great economic importance in the Pacific Islands,¹²⁶ to programmes supporting entrepreneurship, innovation and digital opportunities for women and youth.
56. Given the role that women and youth associations play in the Pacific SIDS, it is critical to support them and even foster the creation of a regional entrepreneurial hub for women and youth across the Pacific Islands. This regional hub or network could facilitate networking and offer business advisory services to assist women and youth to link their entrepreneurial ideas to financing, markets and management services, helping them to innovate and make their businesses a success.
57. Non-state actors, such as the private sector and civil society, can play an important role in any strategy for the sustainable and equitable uptake of digital and non-digital innovations in agri-food systems.¹²⁷ It is necessary to engage the private sector more broadly, particularly from the agribusiness, telecommunication and financial sectors. For example, financial institutions in Fiji and PNG have successfully adopted financial literacy programmes that specifically target women. Further support to women and youth can be provided through codes of conduct, which can serve to alter behaviour within particular industries and agri-food chains across Pacific Island economies.¹²⁸
58. Finally, the SIDS Solutions Forum should be proposed as a periodic forum that allows stakeholders to meet and discuss these issues.

¹²⁵ ITU. 2020. Youth Strategy. Roadmap to 2021 and beyond.

¹²⁶ UNIDO. 2016. See note 40.

¹²⁷ FAO. 2018. See note 61.

¹²⁸ ADB. 2018. See note 13.

Recommendations

59. Pacific SIDS governments need to create an enabling environment that includes gender- and youth-responsive policies, strategies and initiatives to stimulate and accelerate innovation and digitalization. This requires mainstreaming a gender and youth lens and promoting gender and youth equality by empowering them to adopt and/or develop digital solutions and non-digital innovations throughout the food system and value chains. Given that mobile phones are the most frequently used means of accessing the Internet, addressing the mobile phone gender gap could help reduce the Internet usage gender gap. Such efforts must be accompanied by skills training in digital- and business-related topics (e.g. e-commerce and financial literacy), financial support and the development of productive infrastructure required for e-commerce, and complementary initiatives that target women and youth specifically.
60. The creation of an enabling environment also requires close cooperation and partnerships between various stakeholders, such as governments, development agencies, the private sector and civil society. Enhanced cooperation is also needed among Pacific SIDS countries as well as between Pacific SIDS and other countries in the Asia and Pacific region. Enhanced exchanges are also needed between Pacific SIDS and SIDS in other regions.
61. Pacific SIDS should scale up current efforts to create more programmes to empower women and youth to innovate and embrace digitalization. These efforts should include working at the national, regional and global levels as well as building on the current support structures identified, namely business incubation/acceleration programmes and tech hubs; digital villages; and farmer, industry, and women associations and youth councils.
62. In the current context, it is also vital to leverage digital solutions to deliver COVID-19 relief measures targeted to rural women and youth to facilitate their access to digital technologies and income-generation opportunities within the agri-food sector, as well as to dedicate funds for digital acceleration to support women-led and youth-led agri-food enterprises to help them survive the COVID-19 crisis.
63. Finally, it is necessary to bridge the significant gaps in the collection and analysis of gender-specific and sex- and age- disaggregated data regarding innovation, digitalization and entrepreneurship across Pacific Islands. Gathering data at a national level on these topics is essential for designing policies and programmes that can facilitate the participation of women and youth in creating a vibrant and sustainable economy. By collecting the disaggregated data required, Pacific SIDS will facilitate their inclusion in the international rankings on these issues, making it easier to benchmark their progress and raise awareness about the issues faced.

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