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FAO REGIONAL CONFERENCE FOR ASIA AND THE PACIFIC

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**Conserving, restoring and sustainably using biodiversity for food security
and nutrition in the Pacific Islands**

Executive Summary

The Pacific Islands are primary centers of biodiversity. The Pacific region, where land makes up less than 2 percent of the total area, includes some of the richest and most diverse terrestrial and marine ecosystems on the planet. Closely interlinked, biodiversity and ecosystem services support the agricultural sector in multiple ways, benefiting producers' livelihoods and well-being. However, the increasing pace of transition from traditional to more intensive agricultural production systems is threatening this rich biodiversity heritage in the Pacific Island Countries and Territories (PICTs), including the indigenous and local knowledge on which its survival depends. The majority of the PICTs have taken important steps to reverse these negative trends and embed the conservation and sustainable utilization of biodiversity into national strategies, but the capacity and coordination mechanisms to implement these measures are widely lacking. There is a clear need for a more systemic and coordinated approach among key sectors and stakeholders for the sustainable management of biodiversity for food and agriculture in the Pacific region. FAO has been working together with Members and regional partners in the Pacific region to build capacity and collaboration to strengthen the sustainable management of biodiversity for food and agriculture from policies to the field level. This document presents an overview of the efforts made and existing opportunities to promote a regenerative, ecosystem-based agriculture.

Suggested action by the Regional Conference

The Regional Conference is invited to:

- a. take note of FAO's work on conservation, restoration and sustainable use of biodiversity for food and agriculture in PICTs;

This and other documents can be consulted at www.fao.org

b. recommend FAO to develop a regional action plan to promote cohesive action on mainstreaming biodiversity for food and agriculture¹ across sectors in the Pacific region. The action plan will align with relevant global and regional frameworks and initiatives (e.g. FAO Strategy on Mainstreaming Biodiversity across Agricultural Sectors² and the corresponding 2021-2023 Action Plan³ (FAO Biodiversity Strategy and Action Plan); UN Decade on Ecosystem Restoration;⁴ Pacific Islands Framework for Nature Conservation and Protected Areas 2021-2025).⁵ The action plan will contain key areas/actions for FAO's technical support to the Pacific region in developing and meeting regional and national goals, and in monitoring and reporting obligations under the Post-2020 Global Biodiversity Framework.⁶ It will also integrate additional recommendations arising from important global fora (e.g. UN Food Summit 2021⁷ and the Fifteenth meeting of the Conference of the Parties (COP 15) to the Convention on Biological Diversity (CBD)).⁸

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¹ "Biodiversity is the variety of life at genetic, species and ecosystem levels. Biodiversity for food and agriculture is, in turn, the subset of biodiversity that contributes in one way or another to agriculture and food production. It includes the domesticated plants and animals raised in crop, livestock, forest and aquaculture systems, harvested forest and aquatic species, the wild relatives of domesticated species, other wild species harvested for food and other products, and what is known as 'associated biodiversity', the vast range of organisms that live in and around food and agricultural production systems, sustaining them and contributing to their output [such as natural enemies of pests, pollinators, soil micro-organisms]. Agriculture is taken here to include crop and livestock production, forestry, fisheries and aquaculture" (FAO. 2019. The State of the World's Biodiversity for Food and Agriculture. J. Bélanger & D. Pilling (eds.). FAO Commission on Genetic Resources for Food and Agriculture Assessments. Rome).

² FAO. 2020. FAO Strategy on Mainstreaming Biodiversity across Agricultural Sectors. Rome.

<https://doi.org/10.4060/ca7722en>

³ FAO. 2021. 2021-23 Action Plan for the Implementation of the FAO Strategy on Mainstreaming Biodiversity across Agricultural Sectors. Rome. <https://doi.org/10.4060/cb5515en>

⁴ United Nations Decade on Ecosystem Restoration 2021-2023. <https://www.decadeonrestoration.org/>

⁵ Secretariat of the Pacific Regional Environment Programme. 2021. Pacific Islands Framework for Nature Conservation and Protected Areas 2021-2025. Apia, Samoa. <https://library.sprep.org/sites/default/files/2021-11/2021-2025-Framework-nature-conservation-EN.pdf>

⁶ First draft of the Post-2020 Global Biodiversity Framework, released on 5 July 2021.

<https://www.cbd.int/doc/c/abb5/591f/2e46096d3f0330b08ce87a45/wg2020-03-03-en.pdf>

⁷ United Nations Food Systems Summit 2021. <https://www.un.org/en/food-systems-summit>

⁸ Fifteenth meeting of the Conference of the Parties to the Convention on Biological Diversity. 11-15 October 2021 and 25 April-8 May 2022. Kunming, China. <https://www.cbd.int/meetings/COP-15>

I. Introduction

1. The Pacific Islands are primary centres of biodiversity. The Pacific region, where land makes up less than 2 percent of the total area, includes some of the richest and most diverse terrestrial, coastal and marine ecosystems on the planet and hosts six out of the 36 global biodiversity hotspots.⁹ Peoples in the Pacific Islands are strongly connected to biodiversity by longstanding spiritual and cultural traditions.

2. Closely interlinked, biodiversity and ecosystem services support the agricultural sectors in multiple ways, benefiting producers' livelihoods and well-being. However, the increasing pace of transition from traditional to more intensive agricultural production systems is threatening this rich biodiversity heritage in the Pacific Island Countries and Territories (PICTs), including the indigenous and local knowledge on which its survival depends. These intensive agrifood systems are often based on a reduced number of species, breeds and varieties, and they are associated with land overexploitation, uncontrolled clearing of forest, and agrochemical pollution.

3. The majority of the PICTs have taken important steps to reverse these negative trends and embed the conservation and sustainable utilization of biodiversity into national strategies, but the capacity and coordination mechanisms to implement these measures is reported by many countries to be lacking at the national level.¹⁰

4. In response, and in alignment with FAO's overall vision to support the transformation to MORE efficient, inclusive, resilient and sustainable agrifood systems for better production, better nutrition, a better environment and a better life, leaving no one behind, FAO has been working with Members and regional partners in the Pacific region to build capacity to strengthen the sustainable management of biodiversity for food and agriculture. Efforts have included, among others: facilitation of national and regional policy dialogues and knowledge exchange; support to governments in the development and implementation of enabling policies and legislations and compliance with relevant Multilateral Environmental Agreements (MEAs);^{11 12 13} promotion of sustainable agrifood systems and diversified diets; and capacity-building of producers on sustainable agriculture.

5. However, there is a need to foster a more systemic and coordinated approach among key sectors to managing biodiversity for food and agriculture in the Pacific region. FAO proposes the development of a regional action plan aligned with the global biodiversity agenda (e.g. Post-2020 Global Biodiversity Framework,¹⁴ FAO Biodiversity Strategy and Action Plan,^{15 16} UN Decade on Ecosystem Restoration)¹⁷ and with important regional initiatives (e.g. the Pacific Islands Framework for Nature Conservation and Protected Areas 2021-2025).¹⁸ The action plan will address identified key priority areas and will aim to support the region in developing and implementing Post-2020 Global

⁹ Critical Ecosystem Partnership Fund. <https://www.cepf.net/our-work/biodiversity-hotspots/>

¹⁰ FAO. 2019. *Pacific Regional Synthesis for the State of The World's Biodiversity for Food and Agriculture*. Rome. Information provided in country reports submitted by Cook Islands, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands and Tonga. <http://www.fao.org/3/ca7324en/ca7324en.pdf>

¹¹ FAO. 2021. Building capacity related to Multilateral Environmental Agreements in African, Caribbean and Pacific countries (ACP MEAs 3). <http://www.fao.org/in-action/building-capacity-environmental-agreements/overview/en/>

¹² FAO. 2016. Mainstreaming ecosystem services and biodiversity into agricultural production and management in the Pacific Islands. Biodiversity & ecosystem services in agricultural production systems. Technical guidance document. <http://www.fao.org/in-action/building-capacity-environmental-agreements/resources-news/resources/en/>

¹³ FAO. 2017. Ecosystem approaches to agriculture for sustainable management of natural resources and livelihoods in the Pacific Islands. Policy brief. <http://www.fao.org/3/i7969e/i7969e.pdf>

¹⁴ First draft of the Post-2020 Framework, released on 5 July 2021 <https://www.cbd.int/doc/c/abb5/591f/2e46096d3f0330b08ce87a45/wg2020-03-03-en.pdf>

¹⁵ FAO. 2020. *FAO Strategy on Mainstreaming Biodiversity across Agricultural Sectors*. Rome. <https://doi.org/10.4060/ca7722en>

¹⁶ FAO. 2021. *2021-23 Action Plan for the Implementation of the FAO Strategy on Mainstreaming Biodiversity across Agricultural Sectors*. Rome. <https://doi.org/10.4060/cb5515en>

¹⁷ United Nations Decade on Ecosystem Restoration 2021-2023. <https://www.decadeonrestoration.org/>

¹⁸ SPREP. 2021. *Pacific Islands Framework for Nature Conservation and Protected Areas 2021-2025*. Apia, Samoa. <https://library.sprep.org/sites/default/files/2021-11/2021-2025-Framework-nature-conservation-EN.pdf>

Biodiversity Framework goals and in monitoring indicators. It will also integrate biodiversity-related recommendations arising from the UN Food Systems Summit 2021.¹⁹

6. This document presents an overview of the major threats to biodiversity for food and agriculture in the Pacific region, efforts made and opportunities to promote a regenerative, ecosystem-based agriculture. The paper seeks guidance from the FAO Regional Conference for Asia and the Pacific (APRC) on FAO's work in this area.

II. Biodiversity for food and agriculture in the Pacific region: status and threats²⁰

7. The Pacific Islands comprise three ethno-geographic groupings: Melanesia, Micronesia and Polynesia. Each of these subregions possess sensitive and threatened habitats. Ecosystems on the high continental and oceanic islands range from tropical montane cloud forests²¹ that harbour high levels of endemism to some of the most extensive mangrove forests and coral reefs on Earth. In the East Melanesian Islands, such habitats include coastal vegetation and various types of forests (mangrove forests, freshwater swamp forests, lowland rainforests, seasonally dry forests and grasslands, and montane rainforests). Polynesia–Micronesia (all the islands of Micronesia and Polynesia, plus Fiji) contain 12 principal vegetation biomes, the most widespread of which is strand vegetation, which consists of salt-tolerant species. In most PICTs, especially on atolls and other small and highly populated islands and at lower elevations and near urban areas, where there is little or no remaining forest, much of the biodiversity and ecosystem services traditionally provided by forest ecosystems have been replaced by agricultural land-use systems.²²

8. The Pacific region is experiencing a disproportionate loss, relative to the rest of the world, of native flora and fauna. Although there are a multitude of factors which contribute to biodiversity loss, the primary factors are considered to be agriculture intensification and climate change. Land degradation has become an emerging concern in recent years. The shift in farming systems from a subsistence to a market orientation has led to significant land-use changes. Traditional crop varieties are reportedly being lost in Kiribati (breadfruit, pandanus, giant swamp taro, native fig and coconut) and Papua New Guinea (banana, aibika, yam, taro and sweet potato), and the diversity of fruit trees is declining in Tonga. Forest landscapes continue to be under threat from commercial logging, agriculture (predominantly expansion of oil-palm plantations), mining and infrastructure developments. Mangrove ecosystems, which provide goods and services that are highly valued by the people of the Pacific region, face continuing threats from overharvesting, degradation and land reclamation. Increased cross-border trade has also exposed the region to incursions of invasive pests.

¹⁹ United Nations Food Systems Summit 2021. <https://www.un.org/en/food-systems-summit>

²⁰ References:

- FAO. 2016. Mainstreaming ecosystem services and biodiversity into agricultural production and management in the Pacific islands. Biodiversity & ecosystem services in agricultural production systems. Technical guidance document.

<http://www.fao.org/in-action/building-capacity-environmental-agreements/resources-news/resources/en/>

- FAO. 2019. Pacific Regional Synthesis for the State of the World's Biodiversity for Food and Agriculture. Information provided in country reports submitted by Cook Islands, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands and Tonga. <http://www.fao.org/3/ca7324en/ca7324en.pdf>

- FAO. 2019. The State of the World's Biodiversity for Food and Agriculture. J. Bélanger & D. Pilling (eds.). FAO Commission on Genetic Resources for Food and Agriculture Assessments. Rome.

- The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. 2018. The IPBES regional assessment report on biodiversity and ecosystem services for Asia and the Pacific. Karki, M., Senaratna Sellamuttu, S., Okayasu, S. and Suzuki, W. (eds). Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. 612 pages. <https://doi.org/10.5281/zenodo.3237373>

²¹ Tropical Montane Cloud Forests (TMCF) can be found in high altitude areas with high rainfall and are frequently covered in clouds or mist. Due to their high altitude and high humidity, cloud forests regulate water supply, ensuring continuous high-quality water for communities and landscapes downstream. TMCF are also important for biodiversity. Because cloud forests are naturally fragmented, they are characterized by high species richness and endemism, including a great diversity of epiphytes and insects, and are thus considered priority hotspots for biodiversity conservation (FAO.2020. Mountains and Cloud Forests matter:

Celebrating International Mountain Day. Rome. <https://www.fao.org/in-action/forest-and-water-programme/news/news-detail/en/c/1396772/>

²² Thaman, R. 2008. A matter of survival: Pacific Islands' vital biodiversity, agricultural biodiversity and ethno-biodiversity heritage. *Pacific Ecologist*, 16(Winter): 53–61.

Population growth, urbanization and land-use changes or intensification

9. The population of the Pacific region grew from 6 million people in 1990 to an estimated 12.3 million people in 2020 and it is expected to double again by 2050. In many urban areas, the population is increasing at twice the national growth rates (e.g. Solomon Islands, Vanuatu). On the smaller islands, the population is often concentrated in coastal areas.

10. In many countries, the need to produce food for an increasing population has led to reductions in fallow periods and to the use of increasingly steep land (>20 percent slope) for farming. This has caused various forms of soil erosion and a decline in beneficial soil micro-organisms and soil fertility in some cases. Population growth is also often associated with overharvesting of wild foods and wood from forests and mangroves, and with reported pollution of marine lagoon and coastal resources from agricultural toxic waste.

11. Urbanisation tends to increase reliance on and demand for imported foods, which gives rise to a degree of indifference to the land and the biodiversity it supports.

Climate change

12. Pacific Island countries are also some of the most vulnerable in the world to the effects of climate change and disasters. Five PICTs rank among the top 20 most at-risk countries, according to the World Risk Index 2019. Extreme climate events, such as cyclones, floods and droughts, can threaten the reservoir of genetic resources that can be drawn on and bred from to support climate adaptation and mitigation. The recent El Niño has had a devastating effect on agricultural production in many Pacific Island countries and could have affected the future viability of some varieties and breeds.

13. Studies have indicated that forest-tree populations are unlikely to be able to migrate sufficiently quickly to keep pace with the changing climate.²³ They will therefore have to adapt *in situ*, relying on their phenotypic plasticity and genetic diversity. Among the region's forest systems, mangroves and coastal forests are projected to be the most affected by climate change. It is predicted that montane- and cloud-forest ecosystems will contract and that their distributions will shift, moving upslope where this is possible. Damage to montane forests caused by climate change will affect water catchments and harm the region's biodiversity.²⁴

14. Warmer climate is likely to negatively impact high-elevation native bee species which are found above 800 metres. Their current restriction to very high elevations raises the possibility that, if mean temperatures continue to increase, they may be unable to persist by retreating to even higher habitats. As pollinators, this has broader implications for the plant species they interact with and may disrupt angiosperm reproduction.²⁵

15. Climate change is likely to exacerbate the threat from pests and diseases – countries in the Pacific that are currently free from taro leaf blight, a particularly damaging disease of taro, could be at risk in the future given projected increases in temperature and rainfall.²⁶

Invasive species from international trade

²³ FAO. 2015. Coping with climate change, the roles of genetic resources for food and agriculture. Rome. <http://www.fao.org/3/a-i3866e.pdf>

²⁴ FAO. 2019. Pacific Regional Synthesis for the State of the World's Biodiversity for Food and Agriculture. Information provided in country reports submitted by Cook Islands, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands and Tonga. <http://www.fao.org/3/ca7324en/ca7324en.pdf>

²⁵ Lisson, S., Taylor, M., Nonga, N., Cokanasiga, K. & Manuelli, P. 2016. Vulnerability of livestock to climate change. M. Taylor, A. McGregor & B. Dawson (eds.). Vulnerability of Pacific agriculture and forestry to climate change, pp. 347–238. Pacific Community, Noumea, New Caledonia. <https://www.spc.int/sites/default/files/wordpresscontent/wp-content/uploads/2016/12/Vulnerability-of-Pacific-Island-agriculture-andforestry-to-climate-change.pdf>

²⁶ FAO. 2019. Pacific Regional Synthesis for the State of the World's Biodiversity for Food and Agriculture. Information provided in country reports submitted by Cook Islands, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands and Tonga. <http://www.fao.org/3/ca7324en/ca7324en.pdf>

16. Increased ease and availability of transportation and expansion of international trade have led to a rise in the number of invasive alien species across the PICTs, with severe impacts on endemic biodiversity as well as on key economic sectors such as agriculture, tourism and trade. Invasive alien species and diseases constitute one of the greatest threats to all biodiversity and related ecosystem services, including those associated with agriculture. Threats from invasive species include direct predation of native wildlife, competition for resources and ecosystem damage (e.g. through the removal of a key species such as a pollinator), habitat loss and soil destabilization.

Market pressure and deforestation

17. The activities of timber-logging, forest conversion for plantation agriculture or monocultural cash-crop production together with the increased application of agrochemical inputs, have had severe localized impacts on water and soil resources as well as on nearshore coral reefs and coastal ecosystems. This pressure to meet market demand has encouraged less sustainable practices across agricultural sectors. Commercial farming in the Pacific has expanded (e.g. taro in Fiji and Samoa, squash in Tonga, oil palm in the Solomon Islands). Mining and deforestation rates on some of the islands are particularly destructive, both socially (e.g. landslides destroy farms and cause conflict between communities) and environmentally (e.g. increased greenhouse gas emissions, siltation of coral reefs, fragmentation of critical habitat). The total loss of native forests in Nauru is clear evidence of the impact of uncontrolled mining. In the Solomon Islands, more than half of the country's primary commercial forest resources had already been logged in 2011, and timber harvest in 2014 (approximately 2.1 million m³) was seven times greater than the recommended sustainable harvest levels. Over 25 tree species in the country are reported to be threatened, including ebony, rosewood, rattan and some palms.

18. Most of these challenges are interrelated and cannot be addressed individually. Therefore, there is an urgent need to sustainably manage biodiversity for food and agriculture in a way that is more holistic, integrated and ecosystem-based.

III. Biodiversity's key contribution to the sustainability, resilience and inclusivity of agrifood systems in the Pacific Islands

19. The increased reliance on processed, imported food items in Pacific countries has made many locally grown foods economically uncompetitive, has increased malnutrition and the spread of non-communicable diseases, and has made food security more vulnerable to external shocks such as the COVID-19 epidemic. The critical role that biodiversity needs to play in restoring and transforming agrifood systems was recently highlighted at the Pacific Food System Dialogue (May 2021).

20. For many households in the Pacific region, traditional home gardens, agroforestry and silvo-pastoral systems are the only insurance against poverty, malnutrition, poor health and economic downturns. The genetic diversity of these traditional agrifood systems, composed of native and introduced trees, cultivated staple crops²⁷ combined with indigenous leafy vegetables and fruits, and in some cases subsistence production of livestock, chicken and pigs or in-shore reef fish, can provide for a healthy diet.

21. These small and diverse production systems can be input-efficient and more resilient to climate change, e.g. through improved soil moisture conditions. Their production capacity relies on enhanced biological control services by fostering suitable habitats for beneficial insects, enhanced erosion control through soil stabilization and deep soil nutrient capture by tree roots. Overall, they provide a reliable source of food over time.

22. In preparation for the UN Food Systems Summit 2021, several dialogues were held in the region that have voiced the need and urgency to achieve and maintain the stability of food supplies in

²⁷ Predominant staple crops include coconut, banana, breadfruit, pandanus sweet potato, taro, cassava and yam.

the Pacific while fighting poverty, combating hunger and malnutrition, and preserving resilient ecosystems.^{28 29 30}

IV. Good practices and priority areas for the conservation and sustainable use of biodiversity

Existing ecosystem-based production systems that underpin sustainable agrifood systems in the Pacific

23. Notwithstanding the significance of the threats that agricultural intensifications poses to native ecosystems, there are numerous examples of ecosystem-based, agrifood systems that conserve and sustainably use biodiversity in the PICTs³¹ to build on the transformation of food systems.

24. **Agroforestry systems** – where forests and trees are combined with agriculture, waterways, protected areas and settlements on a landscape scale – are effective in restoring deforested or degraded land and in increasing resilience to climate change. Agroforestry makes up 23.8 percent of the Pacific region's total agricultural land, and is increasing.³² Traditional agroforestry systems in Melanesia, Polynesia and the larger islands of Micronesia vary widely and generally include staple and non-staple food crops, often represented by several distinct cultivars, more than 100 multipurpose tree or tree-like species, and countless other useful plants and animals.³³ Even in the extreme conditions of the atolls of Kiribati, Marshall Islands and Tuvalu, a single garden area commonly has more than 40 useful tree or tree-like species, a limited number of ground crops and other useful non-tree plants.^{34 35} For instance, in small Pacific islands, tree fruits and nuts are important components of intensive farming systems.³⁶ In Papua New Guinea, native and exotic tree species such as casuarina (*Casuarina oligodon*), betelnut palm (*Areca catechu*) and gliricidia (*Gliricidia sepium*) provide important agro-ecological services and products for sale or home consumption.^{37 38}

25. **Organic farming** in the Pacific Islands is a holistic system founded upon a respectful relationship with the land, the community and its cultural values. Overall, organic certification continues to expand across the Pacific, although some countries have experienced a decrease in certified land area in recent years. Its expansion has been actively supported by the Pacific Organic and Ethical Trade Community, a not-for-profit membership organization. In 2019, the Pacific Islands had ten approved organic participatory guarantee systems.³⁹ Most of the certified products are for

²⁸ Asia Pacific Regional Food Systems Dialogue. June 2021. <https://www.unescap.org/events/2021/asia-pacific-regional-food-systems-dialogue#>

²⁹ Integrated Sustainable Food Production Systems for a Resilient Pacific, June 2021. <https://summitdialogues.org/dialogue/1355/>

³⁰ Whose paradigm counts? An Australia-Pacific perspective on unheard voices in food and water systems. 9 May 2021. <https://summitdialogues.org/dialogue/16641/>

³¹ Descriptions of more than 20 biodiversity-friendly management practices and approaches, and trends in their level of adoption, are discussed in detail in chapter 5 of *The State of the World's Biodiversity for Food and Agriculture* (FAO, 2019).

³² Zomer R.J., Trabucco A., Coe, R., Place, F., van Noordwijk. M & Xu J.C. 2014. Trees on farms: an update and reanalysis of agroforestry's global extent and socio-ecological characteristics. Working Paper 179.

Bogor, Indonesia: World Agroforestry Centre Southeast Asia Regional Program. DOI: 10.5716/WP14064.PDF

³³ Thaman, R.R. & Clarke, W.C. 1993. Pacific island agroforestry: functional and utilitarian diversity. W.C. Clarke & R.R. Thaman (eds.). Pacific Island agroforestry: systems for sustainability, pp. 17–33. Tokyo, United Nations University Press.

³⁴ Thaman, R.R. 2008. Pacific Island agrobiodiversity and ethnobiodiversity: a foundation for sustainable Pacific Island life. *Biodiversity: Journal of Life on Earth*, 9(1 & 2): 102–110.

³⁵ Thaman, R.R. & Whistler, W.A. 1996. A review of uses and status of trees and forests in land-use systems in Samoa, Tonga, Kiribati and Tuvalu with recommendations for future action. Working Paper 5 (RAS/92/361). Suva, South Pacific Forestry Development Programme.

³⁶ Evans, B.R. 1999. Edible nut trees in Solomon Islands: a variety collection of *Canarium*, *Terminalia* and *Barringtonia*. Australian Centre for International Agricultural Research (ACIAR) Technical Report No. 44. Canberra, ACIAR.

³⁷ Page, T., Murphy, M.E., Mizrahi, M., Cornelius, J.P. & Venter, M. 2016. Sustainability of wood-use in remote forest-dependent communities of Papua New Guinea. *Forest Ecology and Management*, 382: 88–99.

³⁸ Bourke, R.M. & Harwood, T., eds. 2009. *Food and agriculture in Papua New Guinea*. Canberra, The Australian National University Press.

³⁹ Pacific Organic and Ethical Trade Community. 2015. 2015 Annual Report: a review of organic growth. Suva, the Pacific Community.

export; however, the local market for organic products is growing in some countries, e.g. Cook Islands, Fiji, Niue and Samoa.⁴⁰

26. **Domestic and school gardens** in both urban and peri-urban areas contribute to improving the quality and diversity of nutrition, protect culturally valuable traditional plants, herbs and medicines, promote awareness of the benefits of a biodiverse food ecosystem and provide a foundation for learning and recreation. Good examples of such promotion are the supsup gardens in the Solomon Islands, the Give Me Five Programme in Tonga and the Grow and Green in Nauru. All Pacific countries also have school feeding programmes that support local agriculture and contribute to strengthening and diversifying local food systems.

Other key areas to support the conservation and sustainable use of biodiversity for food and agriculture

27. **Conservation of genetic resources.** Conservation is an important element to ensure that diversity in production systems can be maintained and enhanced. The Pacific Community Centre for Pacific Crops and Trees (CePaCT) maintains a regional gene bank with accessions of important staple food crops such as taro, banana and yam, including foreign varieties. The gene bank includes the largest *in vitro* taro collection globally, consisting of over 850 varieties from the Pacific and Asian countries. CePaCT's collections are also composed of varieties that are nutritionally rich (high in carotenoids), pest- and disease-resilient (fusarium wilt, black leaf streak, nematodes, bacterial wilt, anthracnose) and have a degree of resiliency to drought, salt and waterlogging. CePaCT has a mandate to make this genetic material available to the Pacific Islands. Overall, countries need capacity-building to benefit from the provisions of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA – seven contracting countries in the Pacific region) and the Nagoya Protocol (three contracting parties in the Pacific region), and to implement at national level the global plans of action for animal, forest and plant genetic resources for food and agriculture negotiated by the Commission on Genetic Resources for Food and Agriculture (11 Members in the Pacific region).

28. **Ecotourism and food traditions.** Prior to the arrival of the COVID-19 pandemic, tourism had become an increasingly important component of the economies in the Pacific region, accounting for more than 60 percent of gross domestic product in some countries. Agriculture currently has a limited role in ecotourism and ecosystem conservation in the Pacific Islands. However, there is an excellent opportunity, through agritourism, to establish a niche but viable industry based around food and medicinal crops which are native and/or unique to the region and that are produced sustainably. Some examples are the former sugarcane plantation Aviva Farms in Fiji and the Farm to Table programme in Samoa to create a sustainable source of income for farmers, and the Tetepare Descendants Association in the Solomon Islands, which has successfully incorporated conservation, tourism and sustainable community development.

29. **Cost evaluation.** Fundamental to the formation of good policy and the measurement of outcomes is the ability to evaluate the costs and benefits of ecosystem services and biodiversity. A robust quantification of the costs and benefits can support the case for increased investment in ecosystem service capacity-building, management and monitoring. In the case of the Pacific Islands, close attention should be paid to the social and cultural value inherent in a healthy ecosystem, as well as the extensive traditional ecological knowledge within the region. Although there are some good examples of cost-benefit evaluations, such as the economic valuation of mangrove ecosystem services in Vanuatu,⁴¹ these studies are still rare in the Pacific region.

⁴⁰ Research Institute of Organic Agriculture and International Federation of Organic Agriculture Movements. The World of Organic Agriculture. Statistics and emerging Trends 2021. <https://www.organic-world.net/yearbook/yearbook-2021/pdf.html>

⁴¹ Pascal, N. & Bulu, M. 2013. Economic valuation of mangrove ecosystem services In Vanuatu: case study of Crab Bay (Malekula Is.) and Eratap (Efate Is.). Suva, IUCN (available at <http://www.ircp.pf/wpcontent/uploads/20130913MESCALeconomic-valuation-of-mangrove-ecosystems-in-vanuatu.pdf>).

V. FAO's work on biodiversity for food and agriculture in the Pacific region

30. FAO is fully committed to and engaged in promoting an ecosystem-based agriculture to reverse the trend of biodiversity loss. The FAO Strategy on Mainstreaming Biodiversity across Agricultural Sectors⁴² – adopted by the FAO Council at its 163rd Session in December 2019 – and its 2021-23 Action Plan⁴³ aim to mainstream biodiversity across agricultural sectors at national, regional and international levels in a structured and coherent manner, taking into account national priorities, needs, regulations and policies and country programming frameworks. Similarly, FAO coordinates the implementation of the International Initiative for the Conservation and Sustainable Use of Soil Biodiversity, and, through its Global Action on Pollination Services, the implementation of the International Pollinators Initiative 2018-2030, which promote collective, worldwide action to protect soil biodiversity and pollinators, respectively. In 2019, FAO launched its flagship report on The State of the World's Biodiversity for Food and Agriculture,⁴⁴ prepared under the guidance of its Commission on Genetic Resources for Food and Agriculture. The Report presents the first global assessment of the diversity of plants, animals and micro-organisms at genetic, species and ecosystem levels, present in and around crop, livestock, forest and aquatic production systems. In addition, FAO developed a range of biodiversity-related tools and guidance across sectors, including an International Code of Conduct for the Sustainable Use and Management of Fertilizers,⁴⁵ the 10 elements of agro-ecology⁴⁶ and a tool for agroecology performance evaluation (TAPE)⁴⁷ to support agro-ecological transitions, at different scales and in different locations, through informed policy-making processes. Notably, FAO, together with the United Nations Environment Programme, leads the implementation of the UN Decade of Ecosystem Restoration 2021-2030⁴⁸ and organized, jointly with the CBD Secretariat, the Global Dialogue on the role of food and agriculture in the post-2020 Global Biodiversity Framework in July 2021 to position the agricultural sectors as key contributors to the sustainable management and custodianship of biodiversity.

31. In the Pacific, FAO has been working with Members and regional partners to build institutional and technical capacity on the conservation and sustainable management of biodiversity across agricultural sectors through a portfolio of normative and field programmes. Various policy and technical dialogues have taken place in the lead-up to CBD COP15. These much-appreciated dialogues provided policy support for the critical role that the agricultural sectors need to play in the implementation of the Post-2020 Global Biodiversity Framework in the region. These dialogues include: the Consultative Meetings on Biodiversity Mainstreaming across Agricultural Sectors in 2019 and 2021; the Pacific Food Summit in 2021; and the Fiji National Dialogue on Food Systems Summit in 2021.

32. Strategic partnerships have been established with the two regional organizations – SPC and SPREP – to foster a cross-sectoral approach between the agricultural and environmental domains. FAO actively participated in the Nature Conservation and Protected Areas Conference organized by the Pacific Islands Round Table for Nature Conservation in November 2020.

⁴² FAO. 2020. FAO Strategy on Mainstreaming Biodiversity across Agricultural Sectors. Rome. <https://doi.org/10.4060/ca7722en>

⁴³ FAO. 2021. 2021-23 Action Plan for the Implementation of the FAO Strategy on Mainstreaming Biodiversity across Agricultural Sectors. Rome. <https://doi.org/10.4060/cb5515en>

⁴⁴ FAO. 2019. The State of the World's Biodiversity for Food and Agriculture. J. Bélanger & D. Pilling (eds.). FAO Commission on Genetic Resources for Food and Agriculture Assessments. Rome.

⁴⁵ FAO. 2019. *The international Code of Conduct for the sustainable use and management of fertilizers*. Rome. <https://doi.org/10.4060/CA5253EN>

⁴⁶ FAO. 2018. The ten elements of agroecology: guiding the transition to sustainable food and agricultural systems. Rome. <https://www.fao.org/3/I9037EN/i9037en.pdf>

⁴⁷ FAO. 2019. TAPE Tool for Agroecology Performance Evaluation 2019 – Process of development and guidelines for application. Test version. Rome. <https://www.fao.org/3/ca7407en/ca7407en.pdf>

⁴⁸ The implementation strategy for the Decade defines ecosystem restoration as “encompassing a wide continuum of practices that contribute to conserving and repairing damaged ecosystems.” <http://www.fao.org/3/nd651en/nd651en.pdf>

33. The European Union-funded FAO FIRST Programme⁴⁹ has embedded important policy measures to improve production and access to local, safe and nutritious food for communities in the national agricultural development plans in Fiji and the Solomon Islands.⁵⁰ These measures include school food programmes to increase awareness of and demand for diverse, locally produced food, increase access to resilient crop varieties and livestock breeds, and provide social safety nets and market products that mitigate risks for farmers. Several Pacific Islands have also identified a clear need for more in-depth knowledge on the nutrient content of local and indigenous foods in biodiverse food and agriculture systems.

34. National and regional capacity to implement the CBD and mainstream biodiversity across agricultural sectors has been enhanced in the Pacific region under the FAO-European Union partnership programme ACP MEAs 3,⁵¹ which aims to propose effective policy measures and policy implementation mechanisms (e.g. Policy Brief on Ecosystem approaches to agriculture in the Pacific Islands)⁵², build knowledge and capacity on the use of the best ecosystem-based approaches in agriculture (e.g. Technical Guidance Document for the Pacific)⁵³ and help producers in transforming their production systems through participatory training. Collaborative action on protecting soil biodiversity and building resilience to climate change has advanced through the Pacific Soil Partnership and a series of knowledge-based initiatives organized within the Kiwa initiative and the ACP MEAs three programmes (Joint SPC/SPREP/FAO Technical Session on Soil Biodiversity in preparation for the 24th meeting of the Subsidiary Body on Scientific, Technical and Technological Advice of the CBD).

35. Under the Global Environment Facility (GEF)-funded Integrated Forest Management Project in the Solomon Islands, good management practices and integrated landscape approaches are being brought to scale in forestry (expansion of protected-area network; productive mixed-use corridor and buffer-zone landscape; improved non-timber forest product harvesting)⁵⁴ and in crop-based farming systems, with technical support from FAO. With the assistance of the FAO Technical Cooperation Programme, Cook Islands, Fiji, Samoa, Tonga and Vanuatu have committed to address the use of highly hazardous pesticides in agriculture in order to halt negative impacts on human health and the environment, including on beneficial insects, such as pollinators, and wildlife.

36. Through the Sustainable Wildlife Management Programme⁵⁵, FAO is also active in Papua New Guinea, and particularly in the Bismarck Forest Corridor, one of the most biodiverse regions in the world, with many endemic species. This is also an area with a high density of people and where wildlife is an important source of food as well as feathers and fur for traditional costumes. The Programme aims to establish community-led wildlife management initiatives, including community tree nurseries, to address the increasing scarcity of wildlife that represents a growing concern for indigenous and rural communities in the area.

37. Agriculture, livestock and forestry all affect biodiversity in freshwater and coastal ecosystems. FAO is promoting a Blue Transformation approach to the effective management of fisheries and aquaculture, as they too are essential components of transforming food systems in the Pacific islands. FAO's work includes improving the management of coastal fisheries and access to fishery resources, as well as the promotion of aquaculture where it offers an economically viable livelihood.

⁴⁹ European Union-funded FAO FIRST Programme <http://www.fao.org/europeanunion/eu-projects/first/en/>

⁵⁰ The Solomon Islands national agricultural development plan, the Agriculture Sector Growth Strategy and Investment Plan 2021-2030, was launched in October 2021.

⁵¹ Programme on Capacity-building related to Multilateral Environmental Agreements in African, Caribbean and Pacific countries (ACP MEAs 3). <http://www.fao.org/in-action/building-capacity-environmental-agreements/overview/en/>

⁵² FAO. 2017. Ecosystem approaches to agriculture for sustainable management of natural resources and livelihoods in Pacific Island Countries (PICs). Policy brief. Rome. <https://www.fao.org/3/i7969e/i7969e.pdf>

⁵³ FAO. 2016. Mainstreaming ecosystem services and biodiversity into agricultural production and management in the Pacific Islands. Biodiversity & ecosystem services in agricultural production systems. Technical guidance document. <http://www.fao.org/in-action/building-capacity-environmental-agreements/resources-news/resources/en/>

⁵⁴ Global Environmental Facility-funded Integrated Forest Management in the Solomon Islands project. <https://www.thegef.org/project/integrated-forest-management-solomon-islands>

⁵⁵ The Sustainable Wildlife Management (SWM) Programme is an international initiative that aims to improve wildlife conservation and food security. <https://www.swm-programme.info/>

VI. Future opportunities, directions and recommendations to conserve, restore and promote the sustainable use and management of biodiversity in the Pacific Islands

38. While the existing capacity gaps to adequately mainstream conservation, restoration, sustainable use and management of biodiversity for food and agriculture are known, efforts to address them remain diffuse and lack required scale. Many producers and policy-makers understand the important role of biodiversity, but there is a general lack of awareness of the impact that intensive agricultural practices have on ecosystem services. Furthermore, there is limited knowledge about or experience with alternate methods and practices that enhance system sustainability.

39. Concerted action and collaboration among key players across sectors need to be prioritized and strengthened. Based on the outcomes of the *Pacific Regional Synthesis for the State of the World's Biodiversity for Food and Agriculture* and follow-up exchanges with Members and regional partners, FAO would like to propose priority actions to preserve and sustainably use biodiversity for food and agriculture and ecosystem services in the Pacific region as follows:

Key areas/actions for FAO's technical assistance to conserve, restore, sustainably use and manage biodiversity in agrifood systems

- a. prioritize production systems and species at national and regional levels for the scaling out of technical assistance to conserve, restore, sustainably use and manage the biodiversity that underpins traditional agrifood systems;
- b. promote more integrated solutions between sectors that depend on the same natural resource base to identify appropriate and sustainable trade-offs: e.g. agriculture and urbanization for land, Ridge to Reef, Green Cities;
- c. increase taxonomic knowledge of biodiversity found within the various production systems, including conducting surveys in prioritized production systems;
- d. promote the use of alternatives to highly hazardous pesticides to reduce the negative impacts of agriculture on biodiversity;
- e. carry out cost-benefit evaluations of ecosystem-based services for food and agriculture to inform policies;
- f. support countries in the development, implementation (if adopted) and monitoring of the Post-2020 Global Biodiversity Framework;
- g. facilitate stronger collaboration (country-country, national-regional) to support capacity-building and explore innovative approaches that can help compensate for the limited capacity available in the smaller islands.

Key areas/actions for Members to conserve, restore, sustainably use and manage biodiversity in agrifood systems

- a. improve the uptake of technical/field knowledge on integrated approaches and management practices that contribute to the conservation, restoration and sustainable use of biodiversity for food and agriculture;
- b. increase farmers' access to genetic resources and improved varieties, including by integrating the provisions of the Nagoya Protocol and the ITPGRFA into national policies and plans, supported by suitable legal frameworks, to address local farmers' access to and exchange and sharing of genetic resources, use and management of these resources, farmers' rights, and intellectual property;
- c. establish a regional knowledge hub together with the relevant regional partners to ensure that all governments have access to the information and technologies they need for their work on the sustainable use and conservation of biodiversity for food and agriculture and that data and information can be easily shared.

Development of an action plan on mainstreaming biodiversity in the Pacific

40. FAO would also like to propose establishing a multistakeholder consultation process together with key national and regional partners to integrate these key areas and priorities into a coherent, regional action plan for the Pacific. The action plan will aim to provide guidance on how FAO and partners can strengthen the roles of the agricultural sectors – crops, livestock, fisheries, aquaculture and forestry – in the implementation of the *Post-2020 Global Biodiversity Framework* (if adopted) and the monitoring of the relevant indicators.

41. The action plan will be fully aligned with the FAO Biodiversity Strategy and Action Plan, as well as with other relevant global and regional initiatives. The development of such an action plan in the next biennium will also provide an opportunity to contextualize and act on the recommendations arising from the important global events, including the United Nations Food Systems Summit 2021, and to actively contribute to the UN Decade on Ecosystem Restoration.

42. FAO therefore seeks APRC's guidance on the proposed way forward for FAO's work on biodiversity for food and agriculture in the Pacific region.