



Food and Agriculture  
Organization of the  
United Nations

# Ecosystem approaches to agriculture for sustainable management of natural resources and livelihoods in the Pacific Islands

## Policy brief

### The role of ecosystem services and biodiversity in agriculture across the Pacific Islands

Over thousands of years Pacific Island peoples have established a deep relationship with local ecosystems and the services they provide – including food, freshwater and plant materials for artisanal and medicinal purposes. The traditional agriculture and food systems of Pacific Island societies are not only biological systems but also social and cultural systems that provide the solid foundation for cultural identity and social cohesiveness.

As societies transition towards a more commercial farming model, the traditional low-input diversified farming systems dominant in the

region are being replaced by “modern” monocultures. The drive to increase productivity has often been coupled with the intensification of cultivation on existing farmland and the extension of agriculture onto forested and marginal land. It has also, in most cases, brought about an increase in the use of agrochemicals. The environmental footprint of this farming paradigm has raised concerns on the sustainability of agriculture and its threats to biodiversity.

**Ecosystem-based approaches to agricultural production and management** which build upon and strengthen key natural ecosystem services, offer a viable option to sustainably increase agricultural productivity. Sustainable management of soils through practices that increase their organic matter content, such as composting, mulching and application of

manure, and protecting pollinators and pest predators by planting flower strips and hedgerows on farm and at the landscape level are just a few examples of good agricultural practices that are able to decrease pressure on natural ecosystems and biodiversity. Integrated approaches to agriculture, such as agroforestry and agroecology, are also an integral part of adaptation strategies to strengthen the resilience of production systems and landscapes to the adverse effects of climate change.

Sustaining healthy agro-ecosystems requires an effort at multiple spatial scales – on and around the farm, but also at the broader landscape level. In addition, ecosystem services often interact with each other, and there is a need to take into account such interactions to fully harness their potential. An ecosystem perspective to farming recognizes that the regenerative aspects of agriculture occur on the level of the whole farming system, watershed, landscape and community, with the traditional knowledge and experience of farmers and empowerment of communities at its base.

Policies targeting the mainstreaming of ecosystem approaches to agriculture must then look beyond the single sector and bring together different stakeholders – environment, health, planning, agriculture – and work at multiple levels (subnational, national, regional and international).

## International context: linkages to the Convention on Biological Diversity

The Convention on Biological Diversity (CBD) is a key instrument to support sustainable development with its focus on three main objectives: the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising from the use of genetic resources. The CBD addresses a number of overarching as well as thematic and cross-cutting areas on biodiversity which are important for food and agriculture. A number of the **Aichi Biodiversity Targets** are directly

### Key policy messages

#### **Agriculture and biodiversity management are intertwined:**

ecosystem approaches to agriculture reduce the need for chemical use, and in turn their damage to the environment and human health.

**Supportive, cross-sectoral policies are needed** to mainstream ecosystem-based approaches. Existing multi-lateral environmental agreements – such as NBSAPs – are instrumental to achieve larger scale adoption of such approaches, and to bridge the gap between the environment and agriculture sectors.

**Revision of the National Biodiversity Strategies and Action Plans (NBSAPs).** Several NBSAPs of countries in the region do not fully take into account the role of agro-ecosystem services for biodiversity conservation. Revising these instruments and the action plans that accompany them, offers however an excellent entry point to address this issue.

relevant to agricultural biodiversity. This includes Targets 4 (sustainable production and consumption), 7 (sustainable agriculture, aquaculture, and forestry), 8 (pollution), 9 (control or eradicate invasive alien species), 13 (safeguarding genetic diversity) and 14 (ecosystem services). Most of the other Aichi Biodiversity Targets are indirectly linked to agricultural biodiversity either because they address issues related to the sustainability of agriculture or because they address the pressures on biodiversity generated in part by agricultural activities. However, few agricultural stakeholders are directly involved in the implementation of the CBD, although many might be undertaking some measures consistent in practice with the CBD.

Under the Convention, countries have an obligation to develop a **National Biodiversity Strategy and Action Plan (NBSAP)** and to ensure that this strategy is mainstreamed into the planning and activities of all sectors whose activities can have an impact (positive and negative) on biodiversity.

## Ecological agriculture in National Biodiversity Strategies and Action Plans and agricultural sector policies across the Pacific Islands

In September 2016 FAO carried out a keyword-based analysis studying the degree of recognition of ecosystem services and biodiversity in the most recent National Biodiversity Strategies and Action Plans (NBSAPs) and agriculture sector policies (ASPs) across 13 Pacific Islands (see Table and Figure).

While the analysis encompasses countries that are very diverse in nature, including in terms of the overall weight of their national agricultural sectors, some interesting findings emerged with regard to the alignment of key issues – or lack thereof – between the environmental and agricultural domains. It is encouraging for

### List of countries and policies covered by the keyword-based analysis

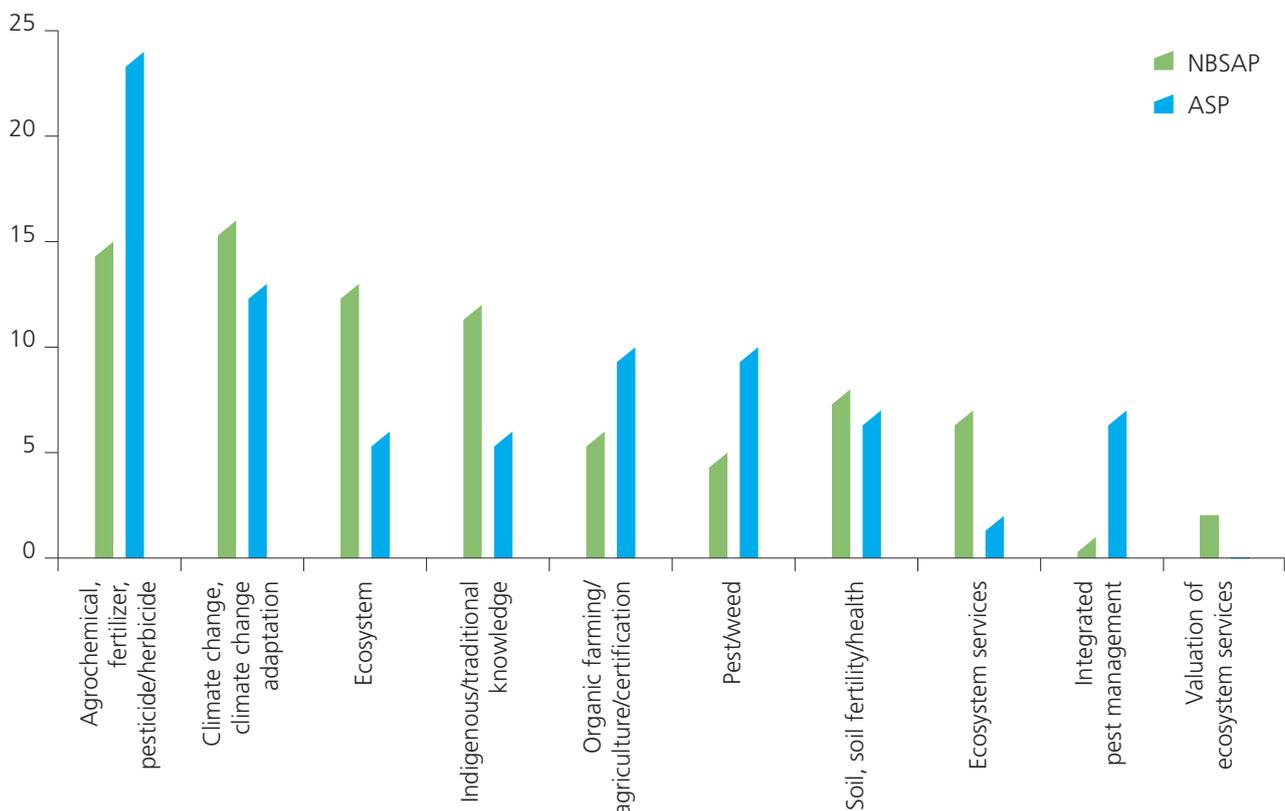
Country	Latest NBSAP (year published)	Title of agriculture sector policy (year published or implementation period)
Cook Islands	2002	Agriculture and Food Sector (2015)
Fiji	2007	Fiji 2020 Agriculture Sector Policy Agenda (2014)
Federated States of Micronesia	2002	Agriculture Policy (2012-2016)
Kiribati	2005	Agriculture Strategic Plan (2013-2016)
Marshall Islands	2000	-
Niue	2015	Food and Nutrition Security Policy (2015-2019)
Palau	2004	-
Papua New Guinea	2007	National Agriculture Development Plan (2007-2016)
Samoa	2015	Agriculture Sector Plan (2016-2020)
Solomon Islands	2009	Agriculture and Livestock Sector Policy (2015-2019)
Tonga	2006	Agriculture Sector Plan (2016-2020)
Tuvalu	2012	-
Vanuatu	1999	Agriculture Sector Policy (2015-2030)

instance to see that **cross-sectoral issues are addressed by both policy instruments – including climate change, pest and weeds, agrochemicals and soil resources.** On the other hand, while the concepts of “ecosystem” and “ecosystem services” are well represented within the NBSAPs, they seem to be less central in ASPs, showing perhaps a lack of clear understanding of the **crucial role of ecosystems services to sustain agricultural production.** The finding seems reinforced by the fact that the concept of “valuation of ecosystem services” is not reflected at all in the ASPs of the countries considered. In addition, the key aspect of indigenous/traditional knowledge seems much better recognized in NBSAPs than in ASPs. Finally, there is still space to promote, within NBSAPs, concepts that may be at a first glance predominantly agricultural, but that also have deep environmental implications, such as

organic farming and certification, and integrated pest management.

Revising NBSAPs and ASPs in light of the growing realization of the role of ecosystem services and biodiversity in agriculture – as well as of the role of agriculture in supporting their conservation – may offer an excellent opportunity to align the priorities of the environmental and agriculture sectors. In Samoa, for example, an analysis of the latest NBSAP (2015) and Agriculture Sector Plan (2016-2020) showed that key elements that are relevant to both realms are currently included in the two sets of policies – including for example the concepts of ecosystems and indigenous/traditional knowledge, climate change and more technical aspects such as soil fertility and agroforestry. This suggests a good degree of coherence between the two policies, supporting the cross-sectoral nature of managing agro-ecosystems for biodiversity conservation.

### Summary analysis of keywords in NBSAPs and ASPs of selected Pacific Islands



These preliminary findings reinforce the following ideas:

- **Ecosystem-based approaches to agriculture and food production can offer solutions for preserving and enhancing biodiversity.** However, they are still not fully incorporated into NBSAPs and national agricultural strategies.
- Further evidence and studies on those components of agricultural systems that directly or indirectly affect biodiversity, and that are of particular concern for the Pacific region (e.g. agrochemical use, invasive alien species and pest/weed management) could help inform and guide both policy processes in the region and activities in the field.

**The current revision of the NBSAPs offers a major opportunity for mainstreaming biodiversity and ecosystem services into the agricultural sector.**

## Key elements of supportive policies for ecosystem-based agriculture in the Pacific Islands

Ecosystem-based agriculture is a natural fit with traditional Pacific philosophy that regulates interactions between people and natural ecosystems. Policy instruments offer an excellent entry point to mainstream further the adoption of ecosystem approaches. Key elements that policy should support to achieve this objective include the following:

### 1 Ecological management and integration of farming systems

Managing agricultural systems according to ecological principles – that is designing them to sustain natural ecosystem services as well as local knowledge and culture – offers the opportunity to build upon existing ecological processes, while at the same time encouraging a relationship of respect and care between land users (smallholder

producers and, indirectly, consumers) and the environment.

Ecosystem approaches to managing such systems – including through established and institutionalized schemes such as the “Organic Pasifika” certification for organic farming developed by the Pacific Organic and Ethical Trade Community (POETCom) – encourage integration in farming systems: growing multiple crops (mixed-cropping), trees (agroforestry), livestock (crop-livestock) and fish (aquaculture). Ecosystem approaches offer an alternative to managing key agricultural issues for the Pacific such as pests weeds, and soil fertility. These approaches limit the risk of misuse of agrochemicals, which is closely linked to severe disruption to natural ecosystem processes,

## Guidance document on ecosystem approaches to agriculture in the Pacific Islands

In collaboration with the Secretariat of the Convention on Biological Diversity (CBD), the Secretariat of the Pacific Environment Programme (SPREP) and the Pacific Community (SPC), FAO has developed a guidance document, *Mainstreaming ecosystem services and biodiversity into agricultural production and management in the Pacific Islands*, which is intended to inform policy-makers – particularly those working on NBSAPs and related policy instruments – and to build their capacity to mainstream ecosystem approaches to agriculture in the subregion, to minimize agrochemical use and in turn to help conserve and enhance the natural resource base. The document is available at: [www.fao.org/3/a-i6505e.pdf](http://www.fao.org/3/a-i6505e.pdf)

favours degradation of land, pollution of soil and water resources, and threatens health of both producers and consumers. Appropriate policies are needed to mainstream practices that help soil fertility – such as composting and recycling of by-products from agricultural production, afforestation and/or reforestation – as well as proper management and control of agrochemicals and support to the application of integrated pest management strategies.

Examples of best practices supported by policies exist in the region, such as the “Grow and Green Project” in Nauru, which targets the planting of local fruit trees to support food security as well as healthy soil organic matter establishment. Implementing ecological practices also requires knowledge. There is a need to build the capacity of producers and to explain clearly the benefits of ecosystem-based practices in agriculture. Policy instruments have a crucial role in supporting this.

## 2 Sustainable management of invasive alien species

In the Pacific, due to the small size and remoteness of individual countries, which results in a high number of endemic species, invasive alien species are particularly dangerous to local natural and human ecosystems in environmental, economic and social terms. Management of invasive alien species exclusively through agrochemicals – which are often easily accessible and cheap to purchase – represents a serious threat, as their misuse can bring about even more severe degradation of environmental resources – soil, water and local habitats and species.

Policy instruments need to strengthen preventive measures through e.g. reinforced phytosanitary standards and appropriate regulations. In addition, they must promote complementary and/or alternative practices to the management of invasive alien species – such as biological control and integrated pest management strategies, and management of natural habitats



Field trials using the mucuna vine for ecological control of weeds, Scientific Research Organization of Samoa (SROS). © FAO/David Colozza

to minimize the impact on crop species – and build capacity on these, including through farmer support groups and “islanders-teaching-islanders” knowledge exchange methods.

### 3 Ecotourism for sustainable agriculture

Ecotourism – that is tourism activities that are directly related to the recreational use of natural ecosystems in a non-extractive way (for example, excluding hunting) – is on the rise in developing regions. The sector offers direct opportunities to influence agricultural production and management in sustainable ways: agriculture can itself be a tourism attraction; it can be part of the tourism supply chain; and ecotourism as a whole can offer an alternative for land use, sparing it from unsustainable practices.

The NBSAPs and other government policies should support this growing industry, while at the same time making sure it maintains strong links with

indigenous populations. Opportunities exist, and are in place across the Pacific Islands to generate revenues from tourism activities that can be directed towards the preservation of natural ecosystems (e.g. the “green fees” paid with departure taxes in the Cook Islands and Palau).

## The ACP/MEAs 2 project

The European Union-funded project “Capacity building related to Multilateral Environmental Agreements (MEAs) in Africa, Caribbean and Pacific (ACP) countries – Phase 2” (ACP/MEAs 2) aims to strengthen regional and national institutional capacity for the synergistic implementation of key Multilateral Environmental Agreements (MEAs) – the Basel, Rotterdam and Stockholm Conventions on hazardous chemicals and wastes, and the Convention on Biological Diversity (CBD) and its Aichi Biodiversity Targets. This is done by:

- Developing tools and guidance on integrating agricultural issues into National Biodiversity Strategies and Action Plans (NBSAPs) of the Pacific Islands.
- Building capacity of national partners through national training workshops.
- Supporting cross-sectoral collaboration between key government sectors – including Environment, Agriculture and Health.

Key partners in the region: the Pacific Community (SPC) and the Secretariat of the Pacific Regional Environment Programme (SPREP).

[www.acpmeas.info](http://www.acpmeas.info)



Hike through the interior of Viti Levu, Fiji. © Talanoa Treks

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*An initiative of the African, Caribbean and Pacific Group of States funded by the European Union*



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17969EN/11/10.17