



PACIFIC ECOSYSTEM-BASED ADAPTATION TO CLIMATE CHANGE

Strengthening and protecting natural ecosystem services to enhance resilience to climate change



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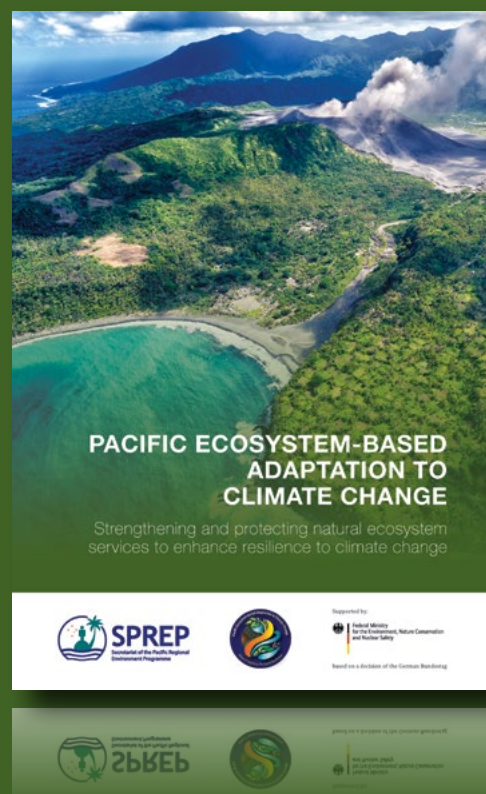
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The Pacific Ecosystem-based Adaptation to Climate Change project (PEBACC) was a five-year EUR4.95 million project implemented by the Secretariat of the Pacific Regional Environment Programme (SPREP). PEBACC was funded by the International Climate Initiative (IKI) implemented by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) on the basis of a decision adopted by the German Bundestag. PEBACC operated in Fiji, Vanuatu and Solomon Islands from 2015 to September 2020.

This synthesis report provides an overview of the project and its activities, including the Ecosystem and Socio-economic Resilience Analysis and Mapping (ESRAM) studies, which were the foundation for the development of ecosystem-based adaptation (EbA) options in the three countries. It outlines the selected EbA demonstration initiatives and highlights the successes and lessons learnt in implementing these options at provincial, island and local/village level. Synthesis reports outlining the findings of the Ecosystem and Socio-economic Resilience Analysis and Mapping (ESRAM) studies are available separately.





Wagina Island, Choiseul Province, Solomon Islands.

Climate change in the Pacific Islands Region

Climate change poses a serious challenge to sustainable development in Pacific island countries and territories. Rising sea levels, changing weather patterns, ocean warming and ocean acidification threaten marine and terrestrial ecosystems, human health, infrastructure, coastal resources, fresh water availability, agriculture, fisheries, forestry, and tourism. Non-climate related factors such as pollution, inappropriate coastal development and over-fishing also impact negatively on island ecosystems resulting in ecosystem degradation, and loss of ecosystem services and biodiversity. To reduce vulnerability to climate change and build island resilience, it is important that Pacific island countries invest in appropriate and cost-effective options that simultaneously address climate and non-climate factors.

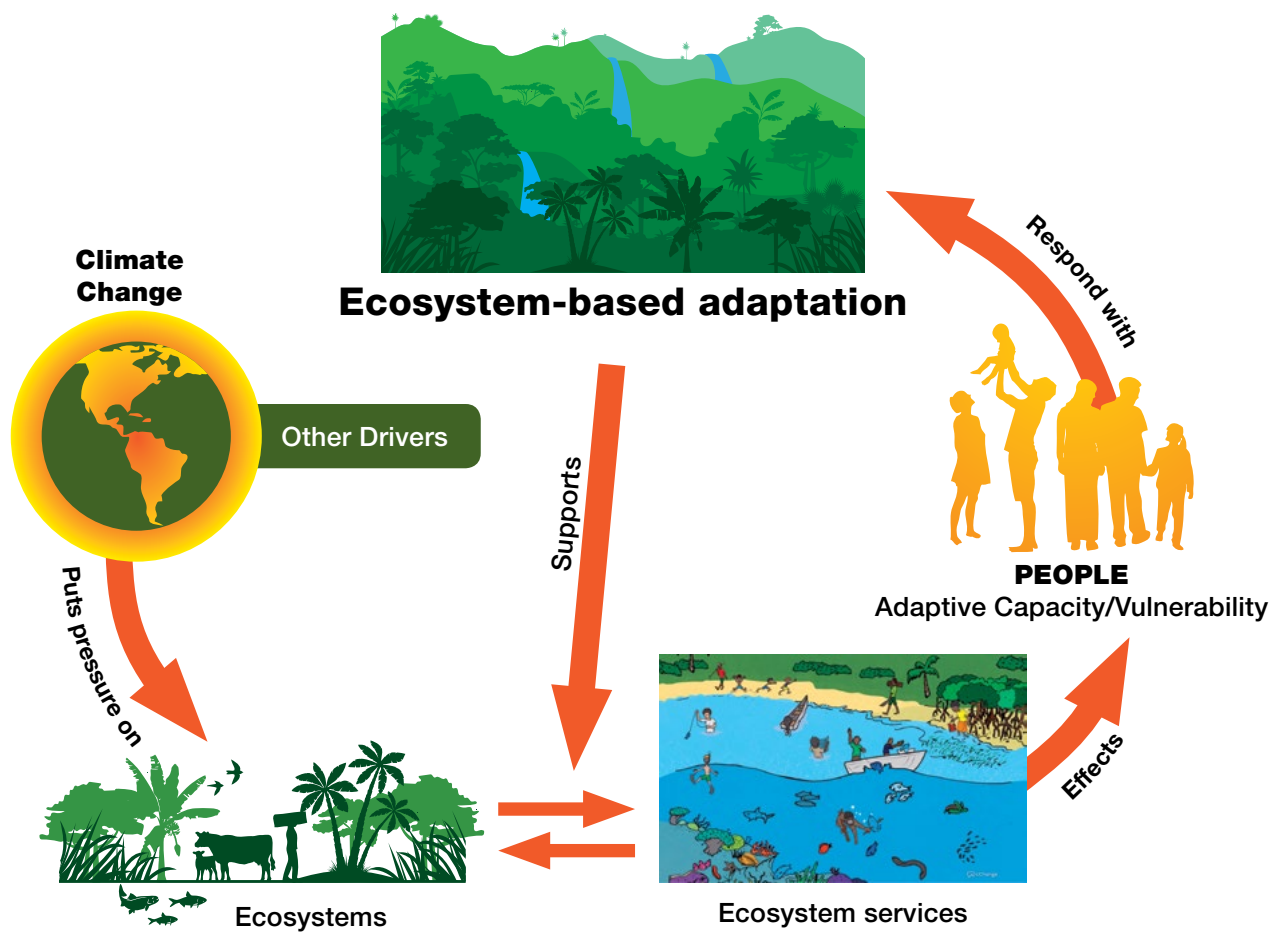
Ecosystem-based Adaptation: the role of ecosystems and biodiversity in building climate resilience

Ecosystem-based adaptation (EbA) is a nature-based approach to adaptation planning that seeks to harness the potential of healthy ecosystems and biodiversity to reduce vulnerability and build social and economic resilience to climate change.

Healthy ecosystems including intact forests, wetlands and coastal areas, provide many services to local communities such as firewood, clean water, medicines, shelter and food. They also form physical buffers against extreme weather events such as cyclones and storm surges. Native forests, for example, are critical to protecting watersheds and preventing erosion and landslides. EbA involves the conservation, sustainable management and restoration of ecosystems to help people adapt to the impacts of climate change.¹

¹ IUCN Issues Brief on Ecosystem-based Adaptation www.iucn.org/issues-briefs

Figure 1: Ecosystem-based adaptation and community resilience to climate change



The PEBACC Project

Awareness in the Pacific islands region of the validity and relevance of the ecosystem-based adaptation (EbA) approach to climate change is increasing. However, to be effective, there is need for a coherent national response to climate change that integrates social, economic and ecological approaches across all sectors and at all levels of society. There is also a need to map ecosystem services and assess how they can build adaptive capacity and contribute to resilient outcomes at community and national level.

The Pacific Ecosystem-based Adaptation to Climate Change (PEBACC) project trialled a systematic approach for identifying and

prioritising EbA options based on analysis of social and ecological factors in the context of climate change and non-climate change threats. PEBACC has helped to prove the value of the EbA approach, and the methodologies employed by PEBACC have been well received by national governments and communities.

The approach involved four stages: ecosystem and socio-economic resilience analysis and mapping studies (ESRAMs), EbA options assessments, development of EbA implementation plans for selected options, and implementation of selected EbA options as demonstration projects. Figure 2 outlines the PEBACC process.



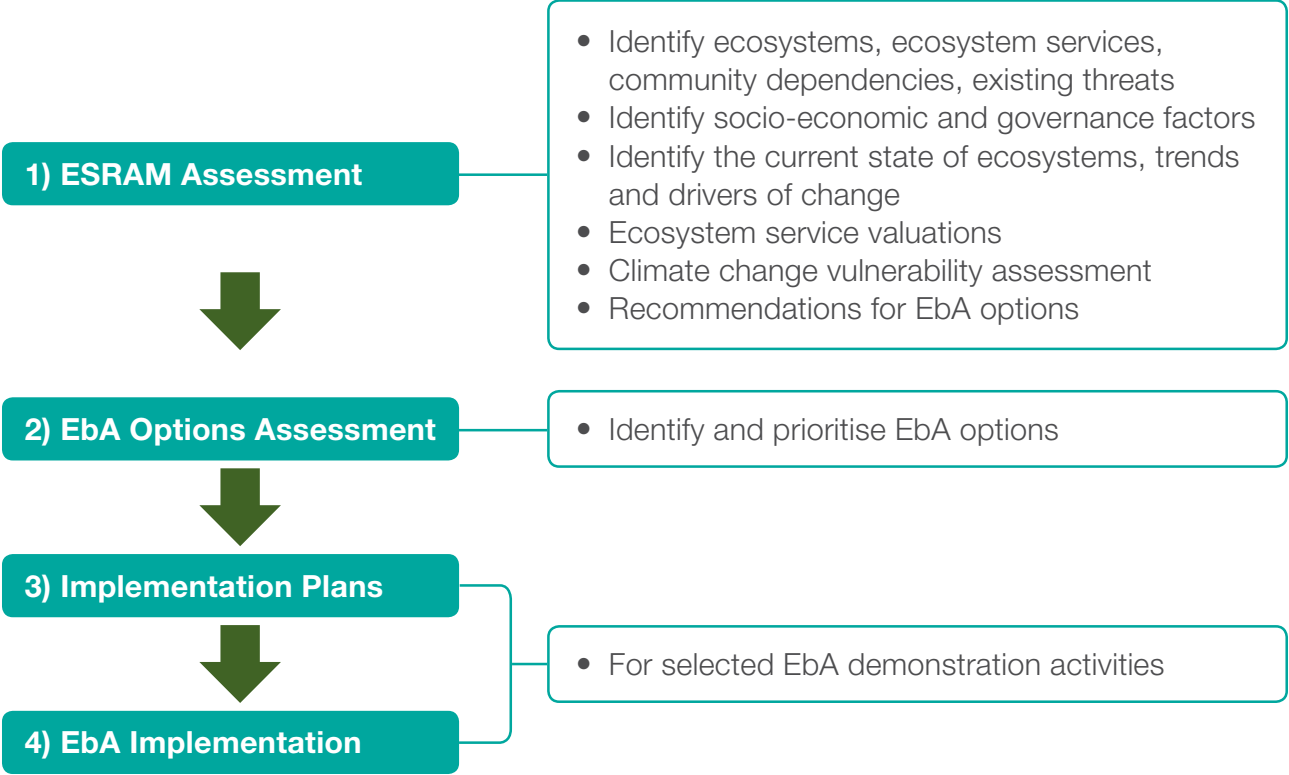
“It is encouraging to see a shift towards not only protected areas but sustainable natural resources management at both provincial and community levels.”

– Dr Melchior Mataki, Solomon Islands

Dreketi River mouth. Macuata Province, Fiji.

© Jason Chute

Figure 2: The PEBACC process





Port Vila Market, Vanuatu.

Conducting the ESRAM Studies and developing EbA Options

With strong participation from government and community stakeholders, the ESRAM studies included a number of iterative steps as illustrated in Figure 3.

The process involved identifying and mapping ecosystems and their services according to their importance as contributors to community socio-economic and climate resilience and their current and future condition in relation to climate and non-climate drivers of change.

The process included economic valuations of ecosystem services. This aspect was key to building understanding of how different ecosystems link to support people's livelihoods and well-being. The ESRAMs formed the foundation from which a range of potential EbA management options were developed for further consideration in the next stage. EbA options typically involved a combination of sustainable management, conservation, ecosystem restoration, addressing policy and governance issues and building institutional capacities.

Figure 4 shows the Taveuni whole-of-island ESRAM map. Similar maps were developed for the other participating sites.

Figure 3: ESRAM Process

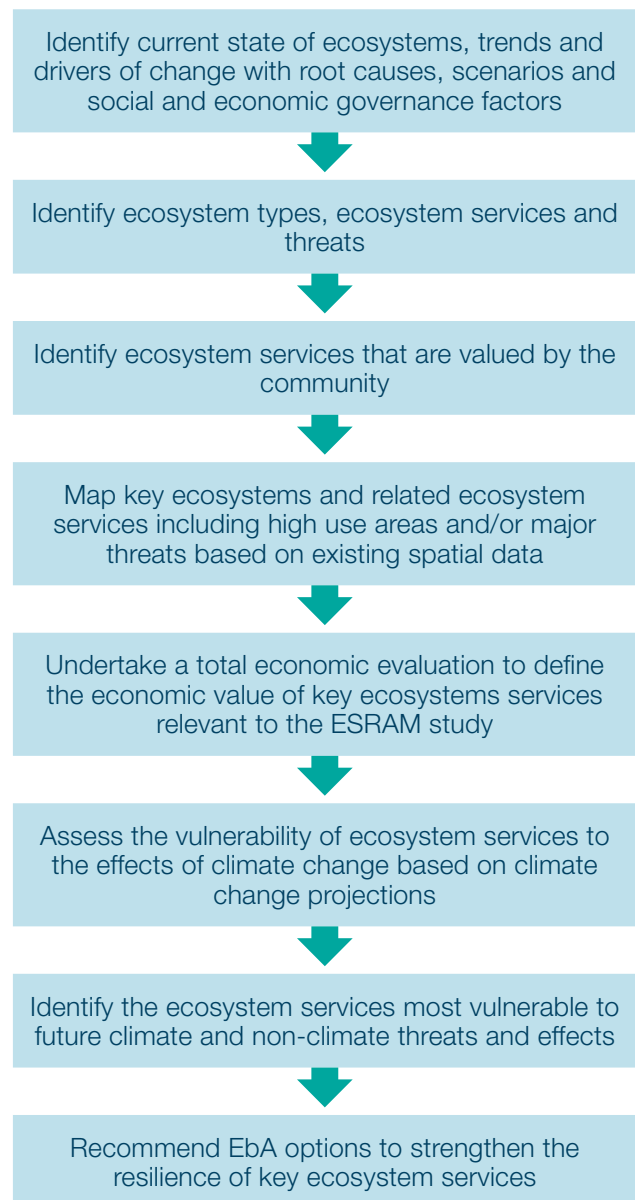
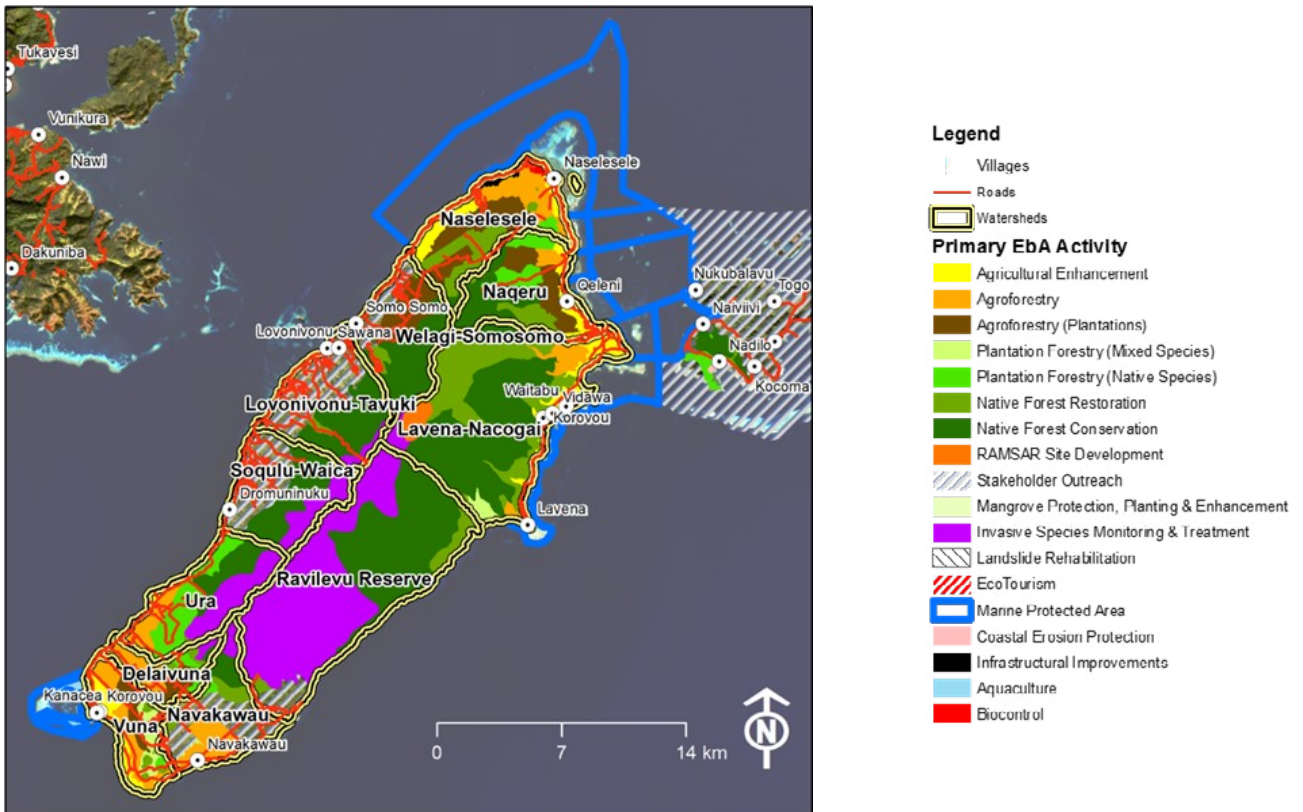


Figure 4: Taveuni ESRAM Map



Selecting the participating sites

The PEBACC project sites were Taveuni Island and Macuata Province in Fiji; Port Vila and Tanna Island in Vanuatu; and Honiara and Wagina Island, Choiseul Province, Solomon Islands. These sites were selected in consultation with governments and they represented a mix of urban and rural locations. Detailed ESRAM studies were conducted for each of these project sites and ESRAMs were conducted at the national level for each of the three participating countries.

Labasa Town and surrounding farmland, Macuata Province, Fiji.

© Stuart Chape

Assessing EbA Options

The second stage of the approach involved assessing and prioritising the EbA options and determining what would be most appropriate – and feasible – for the participating project stakeholders. Participatory Rural Appraisal (PRA) techniques were employed to facilitate the communication of technical concepts to project stakeholders.



Taveuni 3D map.



For example, in Taveuni a three dimensional model of the island was constructed by the communities and this was used to facilitate discussions. Satellite images were also commonly used as planning aids. The process incorporated the application of decision-making tools such as multi-criteria analysis and cost-effectiveness analysis to narrow down and prioritise projects.

EbA Implementation Plans and Demonstration Projects

Stage 3 involved the preparation of implementation plans for the selected EbA options detailing their aims and objectives, implementation arrangements and costings. These plans formed the basis for eleven demonstration EbA projects that were then implemented with partners across the three participating countries.

Figure 4 outlines the 11 projects.

Figure 4: Project sites and EbA demonstration projects

Country	Site	Scale	EbA Project
Fiji 	Taveuni	Island	Whole-of-island Reforestation and Agroforestry Programme
	Macuata	Province	Review and update of the Provincial Natural Resource Management Plan
		River catchment	Management of land-based activities in the Dreketi river catchment that impact on Great Sea Reef ecosystems
Solomon Islands 	Honiara	Urban	Upgrade of the Honiara Botanical Garden
		River Catchment	Established of Barana Community Nature and Heritage Park
		Urban	Addressing the drivers of degradation on the lower Mataniko river
	Wagina	Island	Building local capacity for improved ground water management
Vanuatu 	Port Vila	Urban/Community	Building climate resilience in urban agro-ecological systems through efficient and sustainable use of natural resources
		Urban/River Catchment	Restoration and reforestation of the riparian zone of the lower Tagabe river
		Urban	Urban forests programme
	Tanna	Community	Establishment of Marine Protected Area in Port Resolution

WHAT WORKED

Several factors have been identified as key to the success of the project activities.

► Interventions based on Science

The ESRAM approach represented the first time such an extensive assessment had been undertaken to guide ecosystem-based adaptation (EbA) implementation in the Pacific region. The studies ensured that proposed EbA options were based on stakeholders having a good appreciation of the services their different ecosystems provide. They built on community knowledge and provided the foundation for decision making.



River monitoring, Dreketi River, Macuata Province, Fiji © WWF

► Exchange programmes and cross-project learning

Throughout the project, learning and knowledge sharing has been paramount. In addition to community discussions, training and consultations; exchange programmes were conducted in country and regionally. Such opportunities ensured that lessons and experiences could be woven into other community adaptation projects, which would otherwise be well beyond the reach of the PEBACC project.



“Each new idea can open our minds to broaden our sustainable development goals for our environment, and also the lessons learnt will always be a major driving factor forward in our lives in Kadavu.”

– Mr Malakai Masi, Chairman of the Kadavu Provincial Council, Fiji.

► Meaningful Community Engagement

Community engagement has been the foundation of all the PEBACC work, from the process of developing the ESRAMs through to determining potential EbA options and implementation. By helping communities appreciate the long term value of their natural ecosystems and the (often hidden) services they provide, it has been possible to work with them to develop options for sustainable development. Implementation has been community driven, strengthened by on-ground civil society and government partnerships.



Children assist with mangrove planting, Fiji

© Jason Chute



Ifira Marine Champions, Vanuatu.

► Education, Awareness, Champions

Targeted awareness and education, through workshops, consultations, entertainment and sports, and innovative use of champions and campaigns have proven essential to growing shared commitment within communities to improve environmental management and adopt EbA activities.

► Establishing and strengthening governance and management structures

Identifying, understanding and strengthening existing governance structures are integral to the success of any intervention. At community level, the importance of understanding “unwritten” roles and cultural nuances in the governance structure was underscored in many cases. Time spent on well-organised consultations, disaggregated by gender and other groupings helped to identify these roles and enabled the development of positive working relationships.

Where governance structures were not already in place, PEBAACC helped establish management committees and build local institutional capacity taking care to incorporate traditional systems where appropriate.



Ministries of Forestry and Agriculture sign an agreement to manage the Mua Nursery in Taveuni, Fiji.



Consultations in Port Vila, Vanuatu.

► Adding Value to Existing Initiatives

PEBACC has sought to identify, support and build on existing and ongoing initiatives wherever possible. The multi-faceted, ‘cross-boundary’ nature of EbA requires a range of expertise and for different communities to agree to work together. Trust is needed both between communities and with government, civil society and other partners. Many communities have established and nurtured partnerships with NGOs and

government agencies over long periods of time. Building the trust required to make this happen is often a long-term commitment. PEBACC identified and supported the activities of those agencies that were already working in the demonstration sites. Wan Smol Bag in Port Vila, WWF-Pacific in Macuata, and Conservation International and cChange for Good in Taveuni have been key partners in leading several of the EbA initiatives.



A small group discussion at a workshop in Macuata Province, Fiji.

© WWF

COUNTRY SNAPSHOTS



A fisherman casts his net in Port Resolution Bay, Tanna Island, Vanuatu.

© Piotr Swigon



SOLOMON ISLANDS



© Stuart Chape



Managing Wagina’s Water Resources for the Future

Wagina Island in Choiseul Province in the Solomon Islands, has a land area of 82km² and is 13km long and 9km wide. The people of Wagina are Micronesian settlers from the Gilbert Islands of Kiribati, who were relocated in the early 1950s and 1960s by the British Government.

Although rivers and streams abound on Wagina, overuse and pollution from poorly planned sanitation, waste dumping and boat fuel, has significantly reduced the quality of these freshwater sources. There is high reliance on rainwater harvesting for clean sources of drinking water. Groundwater is accessed during dry periods, however this is threatened by sea level rise, overuse and pollution from animals.

For the approximately 2,000 people on the island, managing and preserving their water resources was identified by the ESRAM studies as an important step towards building their resilience to climate change.

Education and raising awareness of the communities was essential in building the interest and commitment towards the goal of developing and implementing a whole-of-island water resource management guide and action plan. The Wagina Council of Women and the Lauru Land Conference of Tribal Community (LLCTC) are leading implementation of the action plan across the island.



- education and sensitisation of the communities was key
- community consultations and workshops led by women's groups have resulted in the development of water management strategy and guidelines for Wagina communities
- a "water queens' pageant" encouraged each village to support a young participant as a candidate for "water queen". Each candidate was tasked with highlighting water resource management issues according to her designated water resource. The festive and competitive approach was essential to engaging interest of the Wagina communities in water resource management.

Protecting Honiara's important water catchments

Establishing a Community Managed Watershed Area – the Barana Community Nature and Heritage Park

The city of Honiara depends on its water supply from the Lunga, Mataniko and Kovi/Kongulai rivers. The upper water catchments and forest ecosystems provide services such as healthy soil and stability of the natural environment, and clean water, which support the livelihoods of people in Honiara. The Lunga and Mataniko catchment areas are threatened by logging activities, which have impacted on the health of the river ecosystem through sedimentation, loss of biodiversity and increased risk of flooding.

The Barana community are the traditional land owners of these upper catchment areas. Land is mainly used by the local

villagers for traditional shifting cultivation, hunting and collecting bush materials from forests. Small-scale timber milling is carried out for building materials and firewood. In some cases this use of the natural environment is unsustainable and destructive – an example being the use of chemicals to indiscriminately kill wildlife in the river.

Management of the upper catchments of these rivers was identified as a key ecosystem-based adaptation option that would potentially build resilience for the Barana community and improve the river quality in Honiara further downstream.

As an outcome of consultations with the community, the people of Barana agreed to establish the 5,000 hectare Barana Community Nature and Heritage Park under the Protected Areas Act 2010.

The establishment of the Park in 2017 provided the momentum for the Barana community to take responsibility for conservation of their land, while benefitting from more sustainable and long-term income generating activities. The Park has grown from strength to strength since its establishment. Commercial logging has been banned in the Park surrounds. Agro-forestry and flori-culture is providing an alternative and sustainable income, with an innovative “women’s fair” that encourages Honiara residents to escape the city and take the 20 minute drive up to Mt Austen to purchase freshly harvested garden produce.

Tourism provides significant opportunities with Barana’s rich historical background of World War 2 battlefields, local museums, relics and monuments. Natural caves, unique landscapes and biodiversity also



“Our environment is about our resources, traditions, livelihood, history and future, there are endless possibilities, if we coordinate and plan our way of life”

Chief Chuala - Barana Community

offer scenic views and bird-watching tour opportunities. Additional support from the UNDP GEF Small Grants project enabled the development of rest areas and sanitation facilities to encourage visitors to the park. A fee system is being developed to help generate income from the park.

Through PEBACC, an Environmental Resource Centre was constructed and this serves as a meeting place for the Park Management Committee as well as an education centre and a space for researchers. A Tree Nursery has also been established.



The Barana Park Environment Resource Centre built by the project serves as a meeting space, training centre, reception and information centre for the Park.

© Environment Media Solomon Islands



Chiefs and key members of the Barana Community following a planning workshop.

A governance structure that works

The people of Barana continue to live a traditional lifestyle. Access and consent to resource use are often dealt directly by responsible community members, and the landowning groups within a certain area. Usually consultations are done with tribal chiefs and leaders and tribes involved. This system over the years has built trust and commitment from the community and tribal members in managing their land and resources.

The leadership system involves a community council of eight tribal chiefs and community committees. The development of the Park administration structure and the Park Management Committee was guided by this

governance system to ensure that decision making over resources and park management reflects the wishes of the people.

The Park Management Committee meets regularly and has recently completed the Barana Community Nature and Heritage Park Management Plan.

Barana community members retain their customary rights to hunt, garden, collect fire wood and use trees for house materials and small-scale timber mills. The Management Plan has been developed to help regulate and ensure that these activities are done sustainably.



“The Barana Community Nature Heritage Park has taken an integrated and multi-partner approach, securing a foundation that will enable sustainability beyond the PEBACC project,”

Fred Patison, Solomon Islands PEBACC Country Manager.



The new-look Botanical Garden with its upgraded walkways.

Upgrading the Honiara Botanical Garden

Honiara's Green Lung

The Honiara Botanical Garden established in 1965, provides 19 hectares of urban green space where nature can thrive in Honiara city. Urban green spaces play important roles in providing shade, air and noise reduction in cities. Honiara's Rove Creek runs through the Botanical Garden. Improving the health and robustness of the gardens will provide resilience benefits through improved ecosystem health of downstream waterways, including control of sediment and stormwater in the Rove Creek, opportunities for public education and appreciation of the natural environment, and potential income from tourism and other visitors. Urban green spaces improve resilience of the connectivity between urban and natural habitat, providing opportunities for biodiversity to thrive.

Over the years, the garden has suffered significant setbacks and lost its attraction due to intrusion from illegal settlers, vandalism and lack of resources to maintain the space.

In 2018, PEBACC worked with local partners to re-establish the Botanical Garden Management Committee. The committee is chaired by the Permanent Secretary of Forestry and Research, with other members including representatives from the Honiara City Council and stakeholders who actively support implementation of the plan and work in partnership.

With the governing structure in place it was possible to develop and implement a management and business plan, which outlines upgrade of infrastructure, rehabilitation and security and maintenance measures. The Botanical Garden has undergone a facelift. Permanent fencing has been constructed along the perimeter of the garden to keep out vandals, while regular maintenance is carried out on the lawn areas, roads, footpaths and water lily ponds, keeping the grounds neat and tidy.

A new timber boardwalk, concrete footpaths and public resting facilities have been built,

A two-storey herbarium and laboratory building complex has been constructed.

The new herbarium houses over 25,000 plant specimens, representing about 2,500 species. Another 25,809 specimens, currently housed at the South Pacific Regional Herbarium in Fiji, will be returned to the Honiara Botanical Garden in 2021.

A partnership with the Japanese Government LEAF project has resulted in the construction of an environmental learning centre at the Botanical Garden.



“The Honiara Botanical Garden is our forest in the city...it hosts remnants of natural forests, unique species of plants and animals, and the Rove River, which flows right in the middle of the gardens...the HBG is a forest carbon sink and provides wholesale storage and supply of fresh air (oxygen) for Honiara city”.

Myknee Sirikolo, Herbarium Director HBG.



The Botanical Garden Management Committee.

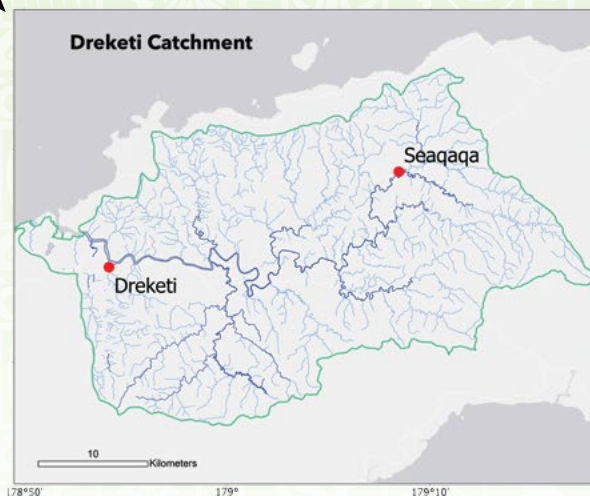
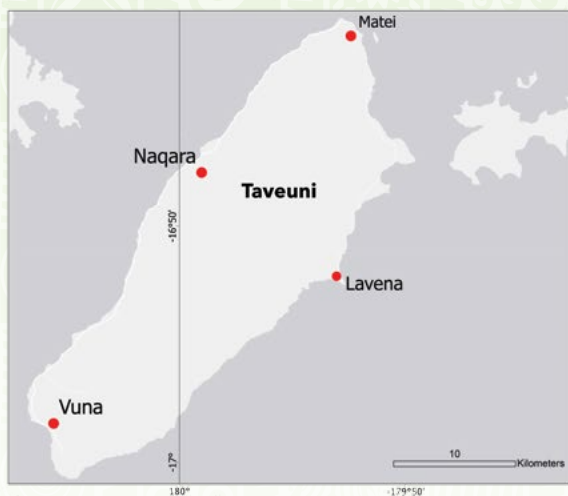
Setting the stage for addressing the drivers of degradation of the lower Mataniko River

The lower Mataniko River in Honiara has deteriorating water quality, river bank erosion and growing informal settlements of communities who rely on the river banks and the water for their basic needs. Its location in the city, combined with complex land issues and community attitudes and perceptions adds to the challenges of rehabilitating the river. Over 3,000 people, including several displaced communities, live along the Mataniko River banks in informal dwellings. Poor waste management and sanitation practices, increasing population and river bank erosion (due to clearing of vegetation) and flooding were identified as key challenges. Seepage of pesticides, industrial chemicals and sewage into the water stream is an additional concern.

In partnership with government, PEBACC has supported awareness campaigns, including the Mataniko Clean-up Project. It has also provided input to the broader Waste Management Programme through the launching of the National Waste and Pollution Control Strategy and the National Implementation Plan to the Stockholm Convention. These documents are foundations of waste management programmes in the country. A survey of the riverbank has provided the baseline information for further rehabilitation of the riverbank and the identification of the most viable trees to plant in the area.



FIJI



Natural Resource Management in Macuata Province

Macuata Province covers an area of 2,000 km² in the north west of Vanua Levu. It shares its boundaries with the Bua and Cakaudrove provinces. The province is divided into 12 districts with a total population of 65,983.²

Major infrastructural developments and increased investments in mining, logging, tourism, agriculture and fisheries in Macuata Province are leading to degradation of water bodies in marine and freshwater areas, and overexploitation of marine, soil and forest resources in the province. The Great Sea Reef within Macuata Province is of significant economic and subsistence

value, and is at risk from over-exploitation as well as degradation from land-based pollution sources.

The Macuata ESRAM describes the province as a complex area that ‘covers many connected landscapes that transcend administrative boundaries into neighbouring provinces, and requires true ridge-to-reef (watershed) management approaches and effective governance.’ A large number of internationally funded interventions focusing on adaptive management and conservation activities have been undertaken in the province and there is traditional community support for these interventions.

² Fiji 2017 Census



Labasa River Estuary, Macuata Province, Fiji.

© Stuart Chape

PEBACC sought to build on these strengths through supplementary training and other support towards strengthening governance and decision-making at individual, community and government level on resource use and management.

Two projects were implemented in parallel through a partnership with the World Wide Fund for Nature (WWF) Pacific.

► **A province-wide approach: reviewing and updating the Macuata Natural Resource Management Strategy.**

PEBACC supported a review and update of the Macuata Natural Resource Management Strategy which is the first province-wide natural resource planning process in Fiji. The plan describes the province’s rich environmental assets as well as their current and future status in the context of current land-use trends and climate change. It lists a number of costed actions to be taken by relevant agencies to address currently unsustainable activities. The plan is multi-sectoral and promotes a coordinated multi-agency approach in collaboration with land-owning communities and land and coastal resource users.



Healthy reef.

© Tim Carruthers

► **Protecting the ecologically and economically significant Great Sea Reef while enabling sustainable agriculture and land and forest management in the Dreketi River Catchment.**

Cakaulevu, Fiji’s Great Sea Reef, is the third longest intact coral reef in the world. A portion of the Great Sea Reef and its inshore area (the Qoliqoli Cokovata) has been listed as a Ramsar Wetlands Site of International Significance by the government of Fiji.



Lavena Village, Taveuni Island.

© Stuart Chape

There is concern that sediment and pollution from land-based agricultural and other extractive activities are impacting health and functioning of the coastal and marine ecosystems of the area.

Through a series of consultations, awareness raising workshops and training activities, PEBACC supported the development of an integrated catchment management plan for the Dreketi River, which is the largest catchment discharging into the Qoliqoli.

Implementation of the plan involves training of farmers in sustainable land and forest management and conducting studies to improve understanding of the catchment and pollution sources. Water quality sampling surveys on point sources of agro-chemical pollution were undertaken, and a hydro-sedimentological model developed to identify sub-catchments contributing to high sediment loading. Communities are also learning to monitor river health using a simple biological indicator method based on the presence or absence of different kinds of macro-invertebrates.

A whole-of-island approach for Taveuni Island

Improving agricultural soil and water catchment health through native tree reforestation and agroforestry.

As a result of a sudden growth in the dalo industry in the 1990s, Taveuni farmers removed large tracts of forests on sloping land and around water catchments to make room for their expanding cultivation. The removal of protective trees and bushland combined with excessive use of pesticides and fertilisers, resulted in deteriorated soil quality, degraded watersheds and low agricultural yields. While some of the land-owning communities have focused on tourism opportunities, others continue to seek out more fertile land by clearing native forests at higher elevations, including encroachment into the Taveuni Forest Reserve.



Mangrove seedlings ready for transplanting, Taveuni Island.

With the support and encouragement of island leaders, an island-wide EbA master plan was developed through community-based processes. Interventions included reforestation and agroforestry, establishment of nurseries, coral reef improvement (coral gardening) and mangrove replanting.

Partnerships were developed with Conservation International, the Pacific Community's Land Resources Division, Scientific Forestry Services and cChange to help implement the master plan.

The project helped establish the Taveuni Yaubula Management Support Team (YMST), a committee under the Provincial Council, that helps to drive conservation and natural resource management on the island. This has now progressed to the establishment of three YMSTs at district level and has further moved down to the village level, with some already established while others are in the process.

Restoration of plant cover in the watersheds is imperative and approximately 4500 native trees have been planted across the three districts under the project with an additional 3000+ planted with support from the Department of Forestry. A central native tree nursery was constructed by PEBACC to supply seedlings to the reforestation programme. It was successfully handed over to the Ministry of Forestry who have undertaken to ensure its upkeep and continued functioning.

Three District Watershed Coordinators were employed through the Cakaudrove Provincial Office to drive activities on the ground and were instrumental in providing a link between the communities and the project. The District Watershed Coordinators will be trained and employed as forest wardens by the Ministry of Forestry after the PEBACC project ends.

Model agro-forestry farms were established in the three districts, with the aim of encouraging alternative sustainable farming approaches.



Plants thrive inside the Mua Nursery.

Leading Change – the Wakatu campaign

The Wakatu Taveuni campaign led by cChange established a network of 120 champions who were integral to promoting awareness and leading initiatives in the participating communities.

Through the Wakatu network, champions used their District meetings to successfully lobby the government to remove chainsaws from the list of agriculture grant items being offered to Taveuni farmers in 2018.

The Wakatu training also resulted in a group of youth vegetable farmers pledging to stop use of chemical fertilisers and pesticides and explore organic farming options.



A youth plants a tree, Taveuni Island.



“If our communities are really going to change, they have to be empowered to create that change. It won’t come from the outside. This training gives community leaders the skills and tools to take the lead, and turn things around for their people.”

Alumeci Nakeke, the lead trainer for Change and the Taveuni Wakatu Campaign



“People are beginning to understand our relationship with nature...the trees that we have been cutting down are the ones that absorbed the water when it rains and then release this water during the dry season...but since there are no trees, there is no water...”

Nicolas Naceba, Headman, Welagi Village, Taveuni

A successful partnership with the SPREP Pacific Partnership on Ocean Acidification (PPOA) project brought in support for marine EbA activities, including establishment of new tabu areas in the qoliqolis.

Notwithstanding the positive impacts of the PEBACC project activities, ongoing education and awareness raising is needed to address the underlying problems of habitat destruction and instil an understanding of the need for native forest protection.



The whole mindset of farmers needs to change – we caused the problem...we made a lot of mistakes as farmers. We need to look at the land as a limited resource...

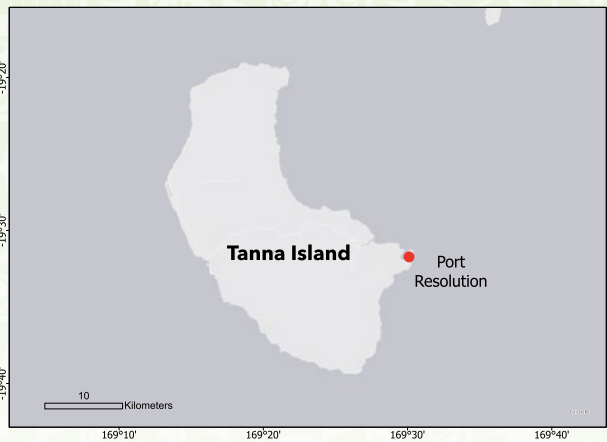
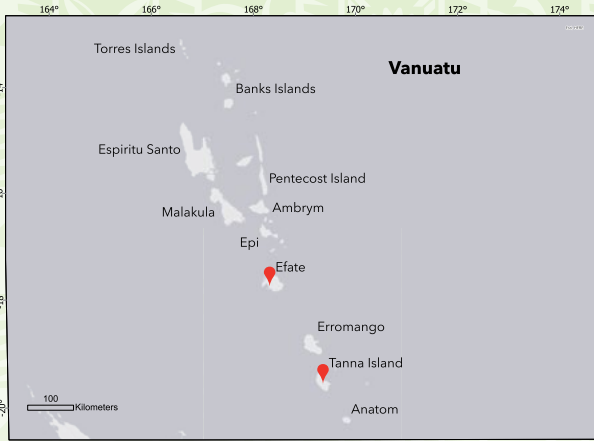
Alan Petersen, Farmer, Teitei Taveuni.



Improving farming techniques – fruit and vegetables in a village garden setting, Taveuni Island.



VANUATU



Restoration and reforestation of the riparian zone of the lower Tagabe River, Port Vila

Port Vila's entire population of approximately 54,400 people³ either depend on water pumped from the Tagabe River by the water utility company, UNELCO, or live on the banks of the river, largely in informal settlements. Despite its importance, the river is heavily degraded from poor waste management, dumping of household and commercial rubbish, and development and cattle farming (in the upper catchment). The river banks are eroding due to removal of trees and bushes and encroaching development. Invasive aquatic plant species, such as the water hyacinth, are taking hold and choking the river, blocking water flow.

The many communities living along the river are highly diverse, adding to the challenges of implementing integrated action.



“These forests are the filters of our water, without them, the rivers would choke and die.”

- Mr Hannington Tate, Forestry Department Director, Vanuatu

³ Vanuatu 2016 Census



Blacksands Community carrying out a planting activity, Tagabe River, Efate, Vanuatu.

This demonstration project focused on beginning the process for rehabilitating the lower Tagabe River and its estuarine and coastal zones. PEBACC worked with the Tagabe Riparian Restoration Project Steering Group, which comprises the Department of Forestry, Department of Water, Department of Environmental Conservation and Protection, SHEFA Provincial Government and Ifira Marine Management Committee. Establishing agreements with chiefs of the different communities were essential first steps towards gaining community trust and engagement. This involved a series of presentations and discussions to raise awareness on the project intentions. Clean up programmes and tree planting activities have followed.

Under the programme, approximately 3,000 native trees, fruit trees and vetiver grass have been planted along the Blacksands coastline and from the river mouth up to the Destination area. The plants will help reduce erosion and eventually provide shade along the river, reducing sunlight, which will curb the growth of invasive aquatic plants. Partnerships with the Department of Forests and Department of Environment will ensure sustainability of the work. PEBACC has supported extension and improvement of the tree nursery at the Department of Forests central nursery in Port Vila. This will help provide a steady supply of plants for revegetation of the river banks.

Restoring and protecting coastal vegetation along the greater Port Vila coastline.

The Port Vila ESRAM identified the need for replanting and regenerating areas where mangroves and other important coastal tree species have been depleted, and implementing policy to strengthen protection of mangrove habitat at the urban, provincial, and national level. The areas identified as priority were the Tagabe River mouth, the Faturaru Estuary, and the Erakor and Emten Lagoons. The coastal revegetation work has thus far

targeted the Blacksands coastline and the Tagabe River mouth, which were identified through a recent survey as being the most impacted areas.

The coastal revegetation involved planting mangroves. Marine Champions were trained to conduct surveys and to monitor the marine environment to assist in management decisions for marine area conservation.



A healthy demonstration garden.

Intensification of home gardens – growing the concept of backyard gardening

The Port Vila ESRAM found that home and bush gardens were critical terrestrial ecosystems, providing a wide range of goods and services to the communities surveyed. In particular, communities rely on their gardens (and forests) for the provision of food, materials, and traditional wealth and livelihood items. Additionally, other garden services that were identified included regulating

services such as soil fertility, protection against erosion, reducing pests and crop diseases and increasing the cycling of nutrients for improving soils. Bush gardens however, are established through slash and burn techniques to clear land for planting. Home gardens are also often established on bare river banks, resulting in soil erosion.

PEBACC has supported the establishment of backyard gardening in an effort to shift reliance on planting and harvesting on riverbanks and in natural forest and bushland. The idea of “bringing nature to our backyard” is also being promoted to introduce habitats for birds and insects and help strengthen natural ecosystems. Backyard gardening is being embraced by many urban families as a means of maximising their small plots of land and providing a ready source of healthy food as well as wood for fuel. A partnership with the Department of Agriculture and Rural Development (DARD) provides technical knowledge and support to set up gardens and conduct community training programmes. A thriving demonstration garden at the DARD Extension Unit office has helped promote community enthusiasm for backyard gardening in urban Port Vila.



Visitors admire the demonstration garden during an awareness raising event



Village homes in Port Resolution, Tanna, Vanuatu.

© Piotr Swigon

Port Resolution, Tanna

The ESRAM identified Port Resolution as having “extreme levels of risk” from poor water quality, shoreline instability, and tourist development, and high levels of risk from harvesting pressure. There was also indication that greater rainfall in the future could mean more runoff and increased impacts on the reef system. The six communities of

Port Resolution Bay raised concern over erosion of the harbour’s cliffs and the depletion of fringing reef fish stocks. The people of Port Resolution live a conservative lifestyle, relying on their marine resources for nutrition and some income from visiting yachts. Port Resolution is an entry point to the active volcano Mount Yasur.

Consultations with the community resulted in an agreement to establish a community conserved area (CCA) in Port Resolution in 2017. The area is approximately 550 km² in size and includes terrestrial and coastal/marine components in roughly equal proportions.

The CCA is managed using traditional ‘custom’ governance. Decision making and regulations relating to the CCA are executed by traditional chiefs, with assistance from the Port Resolution Marine Champions who have received training in marine management and monitoring.

A management plan and a Sustainable Livelihoods Plan has been developed for the CCA. The management plan includes a system of no-take tabu areas to help restore depleted fish stocks and the degraded marine environment. Alternative livelihood activities have been actively promoted including pig and poultry farming and native tree seedling propagation. These have been established with the support of the Department of Rural Development. Other support activities towards strengthening the resilience of the communities of Port Resolution Bay include benthic surveys and a terrestrial biodiversity survey by the New York Botanical Garden.

CONCLUSION

The PEBACC project has demonstrated the value in promoting and implementing ecosystem-based adaptation to climate change approaches in the Pacific islands region at local, sub-national and national levels. The planning and on-ground action implemented by the project has been well supported by all stakeholders and each of the 11 demonstration activities has made tangible and positive impacts on the climate change resilience and sustainable development of project beneficiaries.

However, EbA is a long-term process as ecosystem protection, rehabilitation and capacity building processes take time to establish lasting positive social-ecological outcomes. The effective foundation established by PEBACC provides the basis for continuing and extending its activities to other locations within the participating project as well as to additional countries.

For future EbA initiatives, the project has identified the following key lessons from the process:

1. Focus on fewer geographic/thematic areas to increase impact and make best use of personnel and budgets, where these are limited.
2. Strengthen capacity building on application of ESRAM methodology including GIS applications at national counterpart level.
3. Strengthen training for national and provincial government officials in the planning and implementation of EbA approaches.
4. Design synergistic linkages with other projects and programmes to maximise the impact of EbA implementation and available resources.
5. Strengthen the learning and information exchange component and promote peer-to-peer learning for communities and governments between and within participating countries.
6. EbA interventions should ideally occur over a longer time period than conventional projects – preferably 5–10 years.



The Upper Lunga River, Honiara.

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SPREP
Secretariat of the Pacific Regional
Environment Programme

The Secretariat of the Pacific Regional Environment Programme (SPREP)
(685) 21929 | PO Box 240 | Apia, Samoa | sprep@sprep.org | www.sprep.org