



Sustainable Finance for Invasive Species Management in the Pacific Islands

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Acronyms

ACF	Althelia Climate Fund
ACR	American Carbon Registry
ADB	Asian Development Bank
BNC	Blue Natural Capital
CALM	Climate Action through Landscape Management
CBF	Caribbean Biodiversity Fund
CARE	Community Action for Renewed Environment
CCB	Climate Community & Biodiversity Standards
CDM	Clean Development Mechanism
CEXIM	Export-Import Bank of China
CEPF	Critical Ecosystems Partnership Fund
DFAT	Department of Foreign Affairs and Trade (Australia)
DFID	Department for International Development (UK)
DNS	Debt-for-nature swaps
ECOSUR	El Colegio de la Frontera Sur
EIB	European Investment Bank
EIF	European Investment Fund
EMIIF	Emerging Markets Impact Investment Fund
ETF	Environment Trust Fund
ETS	Emissions Trading Scheme
EU	European Union
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
GCF	Green Climate Fund
GEF	Global Environmental Facility
GHG	Green House Gases
GIIN	Global Impact Investment Network
GS	Gold Standard
GS4GG	Gold Standard for the Global Goals

IAS	Invasive Alien Species
IB	Impact Bond
IETA	International Emissions Trading Association
IPBES	International Science-Policy Platform on Biodiversity and Ecosystem Services
IRR	Internal Rate of Return
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
LCF	Leveraged carbon fund
MEA	Millennium Ecosystem Assessment
MEDA	Mission Economic Development Agency
MFAT	Ministry of Foreign Affairs and Trade
MRV	Measurement, Reporting and Verification
NFP	Not for Profit
NGOs	Non-governmental Organisations
NZETS	New Zealand Emissions Trading Scheme
ODA	Overseas Development Assistance
PbR	Payment by Results
PES	Payment for Ecosystem Services
PfO	Payment for Outcomes
PICTs	Pacific Island Countries and Territories
PNG	Papua New Guinea
PPP	Public Private Partnerships
PVC	Plan Vivo Certificate
PwC	Pricewaterhouse Coppers
PWES	Payment for Watershed Services
REDD	Reducing Emissions from Deforestation and Forest Degradation
RNZ	Radio New Zealand News
SDG	Sustainable Development Goals
SD VISTa	Sustainable Development and Verified Impact Standard
SME	Small to Medium Enterprise
SLMP	Sustainable Land Management Project
SWOT	Strengths, Weaknesses, Opportunities, Threats

Definition of Terms

Term	Definition
Biodiversity credits	An economic instrument that can be used to finance biodiversity-enhancing actions (such as protecting or restoring species, ecosystems or natural habitats) through the creation and sale of biodiversity units.
Blended finance	The use of different financial instruments.
Blue bond	A fixed income debt instrument for funding sustainable ocean business opportunities which support the stewardship and conservation of oceans.
Blue economy	Sustainable use of ocean resources for social and economic benefits while preserving the health of ocean ecosystems, including biodiversity.
Bond	A fixed income debt instrument that represents a loan made by an investor to a borrower (typically corporate or government).
Carbon credits	A tradeable permit or certificate that provides the holder of the credit the right to emit one ton of carbon dioxide or an equivalent of another greenhouse gas. It is an offset for producers of such gases. The main goal is the reduction of emissions of carbon dioxide and other greenhouse gases to reduce the effects of global warming.
Carbon market	A market where carbon credits are bought and sold. It consists of privately organised carbon crediting schemes which supply mitigation units to private buyers who want to compensate their carbon footprint.
Carbon sequestration	The process of capturing and storing atmospheric carbon dioxide.
Commercial conservation	The commercial use of conservation areas. Income can be generated from conservation areas in accordance with strict conservation rules set by regulatory agencies.
Community bond	A debt financing tool issued by a non-profit organisation enabling it to take loans of varying sizes. Those who purchase community bonds are paid interest for investing in a project, and the issuing organisation gains access to capital.
Concession	A form of public private partnership (PPP). A long-term contractual arrangement where the government grants a private entity the exclusive right to build an asset and to operate and maintain it for the agreed term of the concession.
Concessionary debt	Loans that are extended on terms less than market loans e.g., lower interest rates and longer grace periods.
Contingent liability	A financial obligation that may arise in the future. It is recorded when it can be estimated and should be disclosed.
Crowd funding	A financing method that involves funding a project or venture from a large number of people who each contribute a relatively small amount.
Ecological infrastructure	Natural ecosystems provide benefits to human wellbeing (ecosystem services) including the cultural service of the intrinsic value of nature.
Ex-ante financing	Financing before 'the fact', that is, prior to the delivery of a particular task or outcome.
Ex-post financing	Financing after 'the fact', that is, at the end or upon completion of a particular task or outcome delivery.
Externalities	Costs or benefits imposed on an external third party. These are also referred to as 'spill-over' effects or unintended consequences of activities.
Fees	Payment for services.
Foreign Direct Investment	An investment in which an investor resident in one country establishes a long-term relationship, lasting interest, and significant degree of influence in an enterprise in another country.
Green bonds	A type of debt issued by a public or private institution to finance green projects that will have a beneficial effect on the environment.
Guarantee and risk insurance instruments	Risk mitigation instruments designed to manage risks of non-payment, such as in the case of default.

Hybrid financing instruments	Sources of finance that have characteristics of both equities, as well as debt.
Impact bonds	Results-based financing where an investor provides upfront capital and this investment is repaid, often with interest, based on the achievement of predetermined outcomes.
Levies	Taxes imposed on certain groups to contribute money for particular purposes.
Market-based mechanisms	Instruments that use markets, price and other economic variables to provide incentives to achieve improved environmental, ecological, and conservation outcomes.
Non-financial costs	Costs which are not measured in financial terms, such as costs of biodiversity loss on culture.
Opportunity costs	Potential gain missed out on when deciding between two options.
Payment for ecosystem services	Continual series of payments to landowners who agree to steward ecosystem services. Typically refers to a suite of economic arrangements used to reward the conservation of ecosystem services.
Payment for results	Payments contingent on verified results.
Plan Vivo Standard	Set of requirements used to certify smallholder and community projects based on verified climate, livelihoods, and environmental benefits.
Polluter-pays principle	Polluters bear the costs of their pollution. By applying the principle, polluters are incentivised to avoid environmental damage and held responsible for the pollution they cause. It is also the polluter, and not the taxpayer, who covers the cost of remediation.
Public good	A good or a service available to all members within a society or community that possess two specific qualities: non-excludability (people cannot be excluded from using the goods) and non-rivalry (the use of by some does not cause a reduction in their availability to others).
Public private partnership	Collaboration between a government agency and private sector company that can be used to finance, build, and operate projects.
Quasi-equity	A form of debt that shares some traits with equity. This means that it is either unsecured or has a lower priority than other debt. Most beneficial to enterprises that cannot offer shares, or in a situation where a loan would be too risky.
SDG bond	A fixed income debt instrument for funding projects aligned with achieving the Sustainable Development Goals 2030.
Sustainable financing	Ability to secure sufficient, stable, predictable, and long-term financial resources to cover full costs of delivery of an activity's intended outcomes.
Sustainable financing mechanisms	Sustainable financing instruments.
Sustainable land bond	A fixed income debt instrument for funding sustainable land management initiatives that reduce net greenhouse gas emissions.
Theories of change	A process intended to generate a description of a sequence of events that is expected to lead to a particular desired outcome.
Vector pays	Like the polluter-pays principle, those who brought in an invasive species (such as a shipping vessel) pays for the damage imposed on an ecosystem.

Executive Summary

Ecosystems have immeasurable intrinsic value that can never be priced. Ecosystems also exist as ecological infrastructure that delivers valuable ecosystem services for human wellbeing including supporting, regulating, provisioning, and cultural services.

The conceptual framework underlying the analysis in this report focuses on the way that ecosystem services cross over from the biophysical to the social and economic world. This enables the pricing of the human labour and technology cost of protecting and enhancing ecosystems (ecological infrastructure) that provide these services that benefit human wellbeing.

We routinely price this cost of protecting ecosystems in organisational budgets for core and grant funding. We can also price these same costs in a manner that does not rely on government core or grant funding, but instead on a sustainable financing framework.

At the centre of a sustainable financing arrangement is:

1. A budget to do this work (including materials and technology).
2. A sustainable (i.e., not limited to grant funding) revenue stream to cover all operational costs.
3. A sustainable financing modality to cover the establishment costs of the sustainable revenue stream.

There are many sustainable financing options for invasive alien species (IAS) control in Pacific Island Countries and Territories (PICTs). These include the following revenue streams and financing modalities:

Sustainable Revenue Streams

- Taxes & levies.
- Fees.
- Fines.
- Results-based payments.
- Payment for Ecosystem Services (PES).
- Carbon markets.
- Biodiversity credits.
- Revenue from sales.

Sustainable Financing Modalities

- Impact bonds.
- Pooled funds.
- Partnerships for a public purpose.
- Crowd funding.
- Catalytic capital.
- Debt-for-Nature Swaps (DNS) (could be either revenue stream or financing modality).
- Grants.

A sustainable business model combines an IAS control methodology and budget with a sustainable revenue stream with a sustainable financing modality.

Two examples of sustainable business models are presented using biodiversity credits combined with carbon markets (revenue stream) and impact investment (financing modality). The first is on-going rat control and biodiversity enhancement at Mt Talau National Park in Tonga (50-year project), and the second focuses on the eradication of yellow Crazy Ants on Motutala Islet in Tuvalu (10-year project).

The underlying (placeholder) project budget and revenue requirements for these can be used with different revenue streams and financing modalities but presented as practical examples of what can be done using existing capacity and systems.

Sustainable business models will require an organisational and management structure capable of aligning workflows with the timing of revenue streams and attracting finance (e.g., investment). The latter encompasses the institutional readiness component of sustainable financing.

1 Introduction

1.1 TERMS OF REFERENCE

SPREP have contracted Ekos and The Connective to prepare a report on sustainable financing for invasive alien species (IAS).

This report forms a deliverable for the GEF6-funded project entitled ‘Strengthening national and regional capacities to reduce the impact of Invasive Alien Species on globally significant biodiversity in the Pacific.’

Project output 4.1.2 of this GEF6 project (requires that) “sustainable financing mechanisms are in place [in the target countries] to support national invasive species management programs.” This report informs the Battler series publication as an options paper for sustainable financing and the Pacific Regional Invasive Species Management Support Service (PRISMSS).

The primary target audience for the outputs of this work are at the national level. The objective is to support departments and ministries, responsible for the management of invasive species, to create a sustainable finance plan to support activities. Further orientation will be provided to the consultant at the Inception meeting.

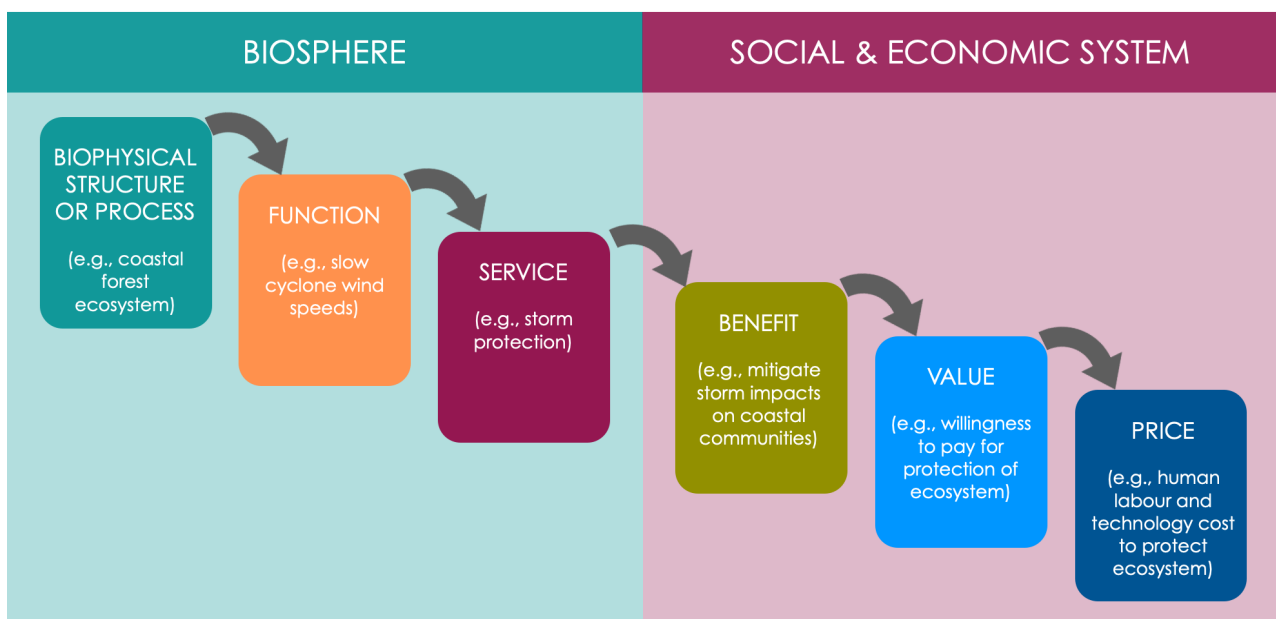
The requirement for sustainable finance can be split into two primary needs for invasive species management in the Pacific:

1. The first is funding for larger singular programmes. These are typically time-bound and focused on a specific set of deliverables.
2. The other is for smaller ongoing needs. This is often needed to sustain the advances delivered by the larger singular programmes.

1.2 CONCEPTUAL FRAMEWORK

The conceptual framework underlying the analysis in this report focuses on the way that ecosystem services cross over from the biophysical to the social and economic world. This enables the pricing of the human labour and technology cost of protecting and enhancing ecosystems (ecological infrastructure) that provide services that benefit human wellbeing (see Figure 1.2).

Figure 1.2 Ecosystem service cascade (modified after Potschin and Haines-Young 2016).



A key feature of the conceptual framework for this work is the focus on conservation outcomes rather than activities. IAS control is an activity that delivers a biodiversity or other human wellbeing outcomes. The effectiveness of IAS control can therefore be measured by the volume of outcome delivery in the form of biodiversity enhancement or the enhancement of some other form of human wellbeing (e.g., enhanced public health).

2 Threat of Invasive Species

Invasive species pose major threats to environmental and human systems. This is a global phenomenon, but with much higher levels of consequences for small island states and territories as is the case in the Pacific region. Invasive alien species (IAS) are most commonly defined as non-native (hence 'alien') to an ecosystem. IAS can be plants, animals, and other living organisms (such as microbes) have degraded ecosystem functions and biodiversity loss in Pacific Islands (Veitch et al 2019; SPREP 2020b). For the purposes of this report, the definition of invasive species stands for alien species that have been introduced to the Pacific Islands, either recently or a long time ago. The definition includes those invasive species that were brought by humans whether accidentally or on purpose and which over time have established themselves as part of terrestrial, water, and marine ecosystems.

Threats from IAS are varied in how they behave, disturb, and damage ecosystems. Over millennia, the remoteness of Pacific Islands served as a natural protective buffer that enabled the development of endemic species not found anywhere else in the world. With no predators, many endemic animals and plants became established in these Islands and form a crucial part of the social and cultural identities of Pacific peoples. It is these exceptional conditions that enabled the development of such diverse endemic species in the region. Indeed, the terrestrial diversity and endemism per unit in the Pacific Islands is recognized as being among the highest in the world, with more than half the diversity of developing nations (Keppel et al 2012).

The increasing movement of people and goods have provided new pathways for the distribution of invasive species to Pacific Islands (SPREP 2020a) and worldwide. This has only been exacerbated through globalisation where once remote islands are visited by people and goods imported into local economies. Whether brought in accidentally or on purpose, invasive species have got over that 'protective' barrier to enter Pacific Islands with devastating consequences. With no natural predators to counteract invasive species, Pacific Islands have suffered some of the greatest loss of biodiversity due in large part to their small size. Unlike continents, where endemic species have the chance to migrate new environmental conditions, the small size of islands mean that invasive species can cause maximum damage to ecosystems and animal and plant species.

2.1 THREATS TO ECOLOGICAL AND HUMAN SYSTEMS

In addition to biodiversity threats, IAS can have broad inter-related effects on human health and wellbeing, across the range of ecosystem service types. Examples include direct and indirect impacts on human health (e.g., from vector-borne diseases, such as malaria, dengue fever, Zika virus, lymphatic filariasis, and chikungunya from *Aedes* mosquito) (Filho et al 2019), livelihood activities such as food cropping, income-generating activities (e.g., food sources for local and export markets) (Pacific Invasives Initiative 2021), cultural and identify factors, and more.

A well-cited example of the impact of IAS was the arrival of the Taro Leaf Blight (*Phytophthora colocasiae*) in 1993 in Samoa which led to a 95% decline in taro production which, in turn, resulted in food insecurity and the loss of incomes from the loss of valuable local and export markets. The total cost of this invasive species has been estimated at USD 40 million (more than the impact of three cyclones) to replace human consumption, lost exports, and the costs of measures to control the disease (Pacific Invasives Initiative 2021).

Another example is the purposeful introduction of a species which has failed and become a serious pest. In the 1990s, many Pacific Islands brought in Mozambique Tilapia (*Oreochromis mossambicus*) as part of a strategy to promote fish farming. Notwithstanding a very small number of success stories, the overwhelming conclusion is one of failure to address the socio-economic issue, and now many Pacific Islands have to deal with a pest that is destroying local ecosystems and threatening native river fishes (Nico and Walsh 2011; Pickering 2015). Clearly, the introduction of Tilapia has not been sustainable, highlighting the importance of strategic decision making considering a broader range of socio-ecological ecosystem factors, so mistakes like this are not repeated

Adding another layer of complexity is the impact of climate change on pathways, distribution, and effects of invasive species (IUCN 2021; Hellmann et al 2008). The IUCN (2021) and SPREP (2016) warn of climate change weakening the resilience of habitats to invasive species. As noted by SPREP, “Invasive species are a climate change problem.” (SPREP 2016: p.11) The double effects of climate change and climatic events like cyclones and hurricanes, prevalent in some parts of the Pacific have the capacity to destroy ecosystem functions that enable invasive species to take hold. They can also have significant indirect effects on food production, food security, and income-generating activities. It is these complex interactions that need to be understood for future financing of invasive species. In conclusion, invasive species comprise an ongoing battle, even more so due to increasing globalization and climate change. Invasions have a range of impacts – direct and indirect ecological, social, economic, and cultural. Controlling species invasions, offsetting the financial impacts of invasions, and supporting native ecosystems have financial components and, therefore, require sustainable financing mechanisms.

2.2 THE COST OF INVASIVE SPECIES CONTROL

The development of a strategy for sustainable financing for the management of IAS requires an understanding of the both the cost of the problem (i.e., financial, and non-financial impact of IAS), and the cost of the solution.

2.2.1 Cost of Problem

The cost of the problem is about the negative impacts of IAS. These costs can be financial and non-financial. A financial cost from an invasive species infestation can cause a reduction in income for a business or households, and lead to the loss of productivity in the agricultural sector. A non-financial cost of an IAS can include, for example, a reduction in human health and wellbeing, a reduction in ecosystem services and biodiversity, cultural resource, or other non-monetary factors caused by invasive species.

The financial and non-financial costs of IAS are typically not counted by the person(s) who caused the problem. The people/organisation at fault may not carry any responsibility for causing those costs. They also may not carry any obligation to identify, measure, or offset these costs. In this situation, the cost is often external to the financial accounting system of the cause of the problem and is, thereby, ‘invisible’ to that person or organization. These external costs, referred to in economics as externalities, are important to capture to fully understand the impacts of IAS on environmental and human systems.

External costs form a major element of environmental problems globally. One aspect of environmental financing is finding ways to internalize these costs by passing the costs of IAS back to the originator of those costs. This concept is similar to the ‘polluter pays’ principle which requires the costs of pollution to be borne by those who cause it. This is a policy and regulation challenge but one worth considering in any sustainable financing agenda.

One way of conceptualizing external costs is through the notion of ‘trespass’. Under environmental law, every unauthorized entry of a tangible object, for example, an invasive species, spray drift, or drift of a genetic modified organism creates a trespass, even in the absence of damages (Cetner 2014). The control and prevention of various forms of trespass is an issue of regulation that governments around the world need to consider. This consideration can be included as part of development of financing mechanisms for managing invasive species.

2.2.2 Cost of Solution

The cost of a solution to an invasive pest problem represents an investment in the reduction of negative impacts of that species. It is often useful to compare (where possible) the costs of the solution in relation to the cost of the problem:

- Paying for a solution can measurably reduce the cost of the problem (*reactionary*)
- Preventing the problem can reduce the costs of solutions (*preventative*)

For example, if we take a specific site in a Pacific Island that a community wants to protect for ecological, biodiversity, and cultural reasons, such solutions can be broken down into three key cost categories:

1. Capital expenditure: creating the conservation asset.
2. Operating expenditure: operating and maintaining the conservation asset.
3. Opportunity cost: what people must give up in exchange for the conservation outcome.

If these three cost elements are unable to be financed, then ensuring protection of ecosystems and preventing biodiversity loss will not be achieved.

2.2.2.1 Capital Expenditure

Capital expenditure is the funds used to acquire, upgrade and maintain a physical asset. An example of a physical conservation asset is the ecosystem that delivers beneficial conservation outcomes.

Capital expenditure examples for conservation projects include:

- Purchase of conservation land.
- Establishment of an ecosystem (e.g., planting a forest).
- Project planning and development.
- Enabling infrastructure required for the project.

2.2.2.2 Operating Expenditure

Operating expenditure is an expense that occurs through normal operations. Operational expenditure examples include:

- Conservation management such as control of invasive species.
- Education, communications, and signage.
- Measurement, reporting and verification.

In strict economic terms, any maintenance of an asset (such as an ecosystem) is classified as a capital expense. We have found, however, that it is conceptually easier to put maintenance of the area to be protected (or conservation asset) into the operational expenditure category. In this manner, the capital expenditure can be understood as the establishment of the conservation asset and operational expenditure can be understood as on-going conservation management of that asset.

2.2.2.3 Opportunity Costs

A conservation opportunity cost is an opportunity that someone must give up enabling conservation to happen. For example, consider a landowner who is making a living from farming an area of wetland that has been drained in the past. Then consider a conservation project proposal to re-establish this wetland. For this to happen the farmer will need to give up farming this land, and in turn, give up the income they receive from farming.

2.2.3 Reactive Solutions

Reactive solutions involve management effort and decision making that responds to a problem that has already arisen, such as the arrival of an invasive species. From a reactive solutions perspective, the IAS is already established, and the conservation management goal is to eradicate it, or reduce the population to a manageable level, or support native ecosystems while living alongside the invasive species.

Reactive control measures have a relationship with time. In some situations, if invasive control measures are undertaken while the population is small and at an early stage of infestation, the level of effort to achieve effective control is relatively low and low cost. This also applies to reactive control in site-specific locations, where early intervention can lead to eradication and prevention of spread. As noted by SPREP (2020c), the lag between colonization of an invasive species and expansion, provides managers with an opportunity to act

quickly to eradicate or effectively manage an invasive species before it has time to spread. The advice proffered by SPREP is that: "...early detection and action is cheaper and more effective" (SPREP 2020c: p.13).

2.2.4 Preventative Solutions

Preventative solutions involve management interventions prior to the problem becoming manifest. This can include:

- Preventing invasive species from arriving in a country
- Controlling or eradicating invasive species before the problem escalates.

This kind of management encompasses biosecurity and early response, where the cost of prevention and/or early action can be far lower than the cost of control (and the negative impacts of the invasive species) after an invasive species has spread widely. This principle of investment in preventative and early action measures is common to a range of risk management sectors including fire control services, public health, and military expenditures. While funding decisions of an organisation are made within a framework of competing priorities, the relatively small cost of early action can help to avoid the relatively high cost of future negative impacts.

In economic language, this is termed 'contingent liability risk'. This is the risk of a liability (i.e., a problematic event and/or the cost of that event) that may occur depending on the outcome of an uncertain (but often predictable) future event. If the harm caused by a certain invasive species is well understood from another setting (e.g., another country) and if the direct cost of the harm is understood and (ideally) has been measured, then it can be relatively straightforward to calculate the cost of the contingent liability and compare this cost with the cost of the preventative measure.

A good example is the direct physical and economic cost of fire in the absence of fire control and comparing this cost with the cost of fire control measures. This principle has helped to justify investments in fire control the world over. An example from 2020 is the direct human and economic costs of the COVID-19 pandemic, compared to the policy and financing investments designed to prevent and control outbreaks. In 2020, an intergovernmental workshop on biodiversity and pandemics (IPBES 2020), noted the underlying causes of pandemics are the same global environmental changes that drive biodiversity loss and climate change. The symposium concluded that without preventative strategies, pandemics will emerge more often, spread more rapidly, kill more people, and affect the global economy with more devastating impact than ever before.

3 Sustainable Financing

3.1 DEFINITION

The term ‘sustainable financing’ has two main taxonomies:

1. Finance for sustainability.
2. Financial flows that are sustainable (i.e., enduring) irrespective of the outcomes delivered.

Finance for sustainability in turn has several definitions depending on the context and the policy framework within which they operate.¹ Such definitions can be broken down into a) legislative definitions by countries and b) market and institutional definitions (e.g., those used by Multilateral Development Banks, green bond instruments and carbon markets). According to Swiss Sustainable Finance “sustainable finance refers to any form of financial service integrating environmental, social and governance (ESG) criteria into the business or investment decisions for the lasting benefit of both clients and society at large.” This alignment of sustainable finance with ESG agendas is common across the environmental financing sector.

Our concern, however, sits with enduring financial flows. For the purposes of this report ‘sustainable financing’ refers to:

The ability of an activity to secure sufficient, stable, predictable, and long-term financial resources to cover the full costs of the effective delivery of the activity’s intended outcomes. In other words, an activity that is financially sustainable is financially self-sufficient and independently generates enough revenue to cover all of its expenses.

For the purposes of this report, sustainable financing is then broken down into three core components:

1. **Sustainable revenue streams** deliver cash flows to fund the operational expenditures of the IAS activity or programme.
2. **Sustainable financing modalities** deliver capital investment to fund the capital expenditure component of a sustainable revenue stream. Example: project development and planning, enabling infrastructure for an IAS project.
3. **Sustainable business models** are strategies and plans for specific types of projects or initiatives that combine sustainable revenue streams with sustainable financing modalities to deliver an IAS outcome.

In the context of IAS control in the Pacific Islands, the availability of sustainable finance would enable existing IAS activities and programmes² to continue their work indefinitely to enable:

1. Funding for larger singular programmes. These are typically time-bound and focused on a specific set of deliverables.
2. Funding for smaller ongoing needs. This is often needed to sustain the advances delivered by the larger singular programmes.

We note the following key sustainable financing agendas for IAS control in the countries in question:

1. **Consolidation & Strengthening:** Existing IAS control initiatives need financing support to enable them to deliver effective IAS control outcomes in a self-sustaining manner.

¹ OECD Developing Sustainable Finance Definitions and Taxonomies. Available here: <https://www.oecd.org/environment/developing-sustainable-finance-definitions-and-taxonomies-134a2dbe-en.htm>

² Such as boarder control mechanisms to prevent IAS introduction, early detection and rapid eradication systems, and the internal management and eradication of established IAS.

2. **New Initiatives:** New IAS control financing modalities enable IAS control beyond existing initiatives.

We will examine each of these three components in the sections below.

3.2 CURRENT FINANCING FOR IAS IN THE PACIFIC

The Pacific Islands have been managing invasive species using funds from a mix of revenue streams, including:

Revenue Stream	Some Examples of Funding to Pacific Islands for Invasive Species
<p>Government revenue:</p> <ul style="list-style-type: none"> • From general taxation, revenue from government investments, and revenue received through commercial charges which are usually based on market rates. 	<p>Government revenue is a common mechanism for the management of invasive species in the region. This involves annual cycles of funding where budget bids are assessed for funding, typically competing against other priority areas. For example, in Hawaii, a baseline funding stream has been created for conservation from government revenue, meaning that the sector can be assured of ongoing annual funding. In most other cases, however, governments make decisions about priorities for funding as a competitive process across all government departments.</p> <p>The use of charges and fees: some Pacific countries have implemented biosecurity border cost recovery to prevent the entry of IAS and to manage processes associated with quarantine, destruction of invasive species, and management of any incursion. Some examples of Pacific Islands utilising charges and fees for the management of invasive species through biosecurity border recovery include Fiji, Palau, Samoa, Cook Islands, Tonga, Kiribati, Tuvalu, Marshall Islands, and Niue. The issue is the extent that charges and fees are applied at market rates and application of charges and fees to cost recovery for the entire biosecurity system.</p> <p>Does this meet the sustainable financing definition in this report?</p> <p>No. Government revenue for IAS control is dependent on governments being able to source funds to support such expenditure in an enduring manner that will survive electoral cycles and changing leadership. In turn, this is dependent on political will to maintain funding for this activity. Governments typically have variable revenues to support the national budget, and when budget cuts are required to fund higher priority conservation will tend to be among the first budget items to be cut. One option to increase the probability of sustainable financing for government-funded programmes is where revenue is generated through taxes or levies in a manner that specifically targets IAS control. One option for this is levies on activities that pose IAS risk.</p>
<p>External Funding:</p> <ul style="list-style-type: none"> • From bilateral, regional, and multilateral overseas development assistance agencies. • Grants from UN agencies, development agencies, NGOs, and UN and private sector partnerships focused on environmental, conservation and biodiversity outcomes. • Regional organisations. • Philanthropic organisations. 	<p>Overseas development assistance (ODA) and grants are among the most commonly used financing mechanisms used by Pacific Islands to manage IAS. Australia and New Zealand have a history of funding specific projects in Pacific Islands and funding regional programmes through SPREP. Some examples include New Zealand boosting funding in 2019 for climate change in the region with an allocation for: <i>“more projects to get rid of invasive species that threaten food security. This will boost the resilience of key crops that are also vulnerable to increasingly unpredictable weather driven by climate change”</i> (Rt Hon Jacinda Adern (2019).</p> <p>Another example is the United States funding specific projects for the management of invasive species in its territories and states, such as funding programmes to eradicate the coconut rhinoceros beetle, invasive trees, and building resilience of coral ecosystems (RNZ News 2019).</p> <p>Other countries providing aid funding for the management of invasive species and ecological conservation include Japan, Germany, and Canada. Regional grants for invasive species in the Pacific include funds from the European Union.</p>

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- **UN/private partnerships.** In addition to bilateral aid funding, a wide range of international organisations, multilateral agencies, NGOs, civil societies, and philanthropic organisations provide grants for the management of invasive species in the Pacific.

Some examples include:

- Global Environment Fund (GEF).
- Food and Agriculture Organization of the United Nations (FAO).
- The Nature Conservancy.
- Critical Ecosystem Partnership Fund (CEPF) – a joint venture of l'Agence Française de Développement, Conservation International, the Global Environment Facility, the Government of Japan, the MacArthur Foundation, and the World Bank.
- Conservation International.
- BirdLife International.
- IUCN.
- Green Climate Fund.

SPREP and IUCN also assist Pacific countries to access funding from the GEF and climate change funding organisations. SPREP supports members with information and technical assistance to improve their national systems for accreditation and access to climate finance.

Does this meet the sustainable financing definition in this report? No.

**Community-led
/Volunteerism**

- **Community/school initiatives.**

Community and school volunteer initiatives have been used to finance IAS activities through in-kind contributions from local communities and schools. Here the financial resources required for operational activities are zero because the voluntary participants are donating their labour. For example, the mobilisation of schools in recognising and dealing with invasive species has led to the development of the SPREP invasive species school resource toolkit.

There are many examples across the Pacific of local communities and schools initiating and implementing programmes to manage invasive species locally and working with conservation partners and NGOs to manage local invasive problems. Local communities give the time freely to restore land and marine ecosystems free from invasive species.

One example is the work of the local community of Kayangel Atoll (Palau), which together with conservation partners successfully eradicated all rats from their Atoll. The eradication of rats was credited for saving the endangered Micronesian Megapode enabling the community to now grow tapioca and a variety of fruits and vegetables which were previously destroyed by rats that also passed on diseases.

Another example is local community members working with Vava'u Environmental Protection Association (VEPA) to rid Mount Talau National Park of feral pigs.

Does this meet the sustainable financing definition in this report?

Only at a relatively small scale and with limited scope that is beyond the need IAS control needs for the target countries.

3.3 EXISTING GOVERNMENT BUDGETS FOR IAS CONTROL

The following budget information was gathered for the target countries:

Country	Funding of IAS
Tuvalu	<p>Budget 2021 https://mfed.tv/wp-content/uploads/2021/01/2021-National-Budget-1.pdf Environment portfolio is together with infrastructure, public works, labour, meteorology. The whole group comprises 9% of total revenue allocation. Strange given that agriculture comprises 12% of total appropriations. AUD 21,200 allocated for contribution to Multilateral Environmental Agreements (major policy initiative). Central government revenue driven by remittances, fishing licences, ODA, and grants from multilateral agencies and international organisations. List of Invasive Species. CABI. 2019. Invasive Species Compendium. https://www.cabi.org/isc/datasheet/108589</p>
Niue	<p>Runs a deficit – ODA. No revenue for invasive species. List of Invasive Species. CABI. 2019. Invasive Species Compendium. https://www.cabi.org/isc/datasheet/108527</p>
Tonga	<p>Budget 2021 http://www.finance.gov.to/sites/default/files/2021-05/Budget%20Statement%202021-22%20final%20to%20LA%20english_0.pdf Mentions resilience- but focus on economic resilience post COVID-19. Also mentions climate change adaptation. No mention of invasive or biodiversity or invasive species in terms of priorities for funding. There is no Minister for the Environment (rather Agriculture, Lands, Resources, and Forests). List of Invasive Species. CABI. 2019. Invasive Species Compendium. https://www.cabi.org/isc/datasheet/108585</p>
Marshall Islands	<p>Budget 2021 http://rmi-mof.com/wp-content/uploads/2017/02/MTBIF-RMI-2016-2021-2.pdf Environment accounts for only 0.2% of total Budget. No mention of conservation, biodiversity or invasive species. List of Invasive Species. CABI. 2019. Invasive Species Compendium. https://www.cabi.org/isc/datasheet/108499</p>

An examination of the latest budgets of these countries highlighted the difficulties they faced in financing projects and activities for the management of IAS. In each of these countries, there was little or no mention of IAS, the environment, or conservation. This reflects the difficulty in financing these sectors given other high priority areas requiring funding, including health and education, and critical infrastructure. It is difficult for IAS initiatives to compete for scarce budgetary resources. Given these financing realities, IAS project currently continue to rely on external grants, ODA, and the goodwill of local communities. These constraints underpin the need for sustainable financing mechanisms.

4 Sustainable Revenue Streams

Sustainable revenue streams are the core component of sustainable financing mechanisms, that enable continuous delivery of the desired IAS outcomes (without financial constraint and/or disruptions from grant cycles).

Sustainable revenue streams also have the potential to generate additional value at a community-level such as more secure employment for IAS project employees and contractors, enhanced biodiversity and ecosystem services, and economic diversification into sectors dependent on thriving ecosystems (e.g., agroforestry and ecotourism).

The following sustainable revenue streams were considered in this report:

- Taxes and levies.
- Fees.
- Fines.
- Results-based payments.
- Payment for ecosystem services.
- Carbon markets.
- Biodiversity markets.
- Revenue from sales.
- Environmental Trust Funds.

4.1 TAXES AND LEVIES

4.1.1 Description

Taxes and levies are compulsory payments imposed on individuals and businesses by government for the purpose of spending on 'public goods.' The key difference between a tax and levy is that taxes are gathered for general purposes,³ while levies are usually earmarked for a particular purpose and function as 'hypothecated taxes' where revenue is recycled directly to a particular sector.

While taxes and levies are most understood in the context of collection from citizens, they can also be collected from foreign individuals and companies. Tourism taxes (on entry) for example, are increasingly popular to counter some of the ill-effects caused by high volumes of tourism. Additionally, foreign businesses can be taxed for imports (e.g., a flat tax to cover biosecurity processes) and for business operations in PICTs (e.g., an environmental tax on Foreign Direct Investment).

The purpose of a tax or levy is typically two-fold:

1. Collect revenue to fund the solution of a problem.
2. An economic instrument designed to disincentivise a particular negative impact by raising the cost of the activities that cause those impacts.

³ Taxation revenue is appropriated and spent by a government according to the particular policy objectives or requirements of the day (New Zealand Treasury 2017). This appropriation is often used to create what is called a 'baseline' to fund a certain level of services. While a baseline is not a guarantee of future funding, it indicates the ongoing nature of services to be funded over a number of years. The levels of these baselines change with annual budget cycles as governments decide priorities for funding. In the Pacific, activities and services related to invasive species appear within conservation, environment, and primary industry baselines.

Notably, taxes and levies collected for the environmental purposes are often managed via the establishment of special purpose ‘Environmental Funds’. Alternatively, relevant government ministries and agencies distribute revenue according to pre-established processes.

In determining *who* is the most appropriate target for taxation for the purpose of funding environmental initiatives, several well-established principles can guide policy makers: polluter pays, beneficiary pays, ability to pay, and grandparenting. Table 4.1.1 below provides a definition of each, with corresponding examples of who might pay in accordance with each principle.

Table 4.1.1. Tax/levy Payment Target

Principle	Definition	Example of ‘payer’
Polluter pays	Entities responsible for environmental damage should bear the costs of managing it to prevent, and preferably undo, harm.	Tax on maritime vessels that bring IAS into foreign waters.
Beneficiary pays	Entities that benefit from the preservation or restoration of biodiversity and ecosystem services either directly or indirectly should pay.	Tourism operators that benefit from a pristine environment.
Ability to pay	Those who have the means and capabilities of mitigating environmental harm should do so, regardless of whether they themselves have caused it.	Graduated taxes on tourists based on price of accommodation (i.e., higher taxes on tourists that stay in expensive resorts).
Grandparenting	Those who have historically harmed the environment legitimately (i.e., within the law) should be allowed to continue doing so.	Mining companies that have damaged local biodiversity and ecosystems.

4.1.2 Examples

Examples of levies in the Pacific:

- **Tuvalu Waste Management Levy:** this levy is charged and payable on specified goods and products (e.g., plastics, batteries). Any person importing goods listed under the Schedule must pay the levy at the point of entry (Waste Management (Levy Deposit) Regulation 2019).
- **Border Clearance Levy:** this is widely used across the Pacific to recover costs associated with customs and biosecurity.
- **Environmental Levy (Fiji):** this levy charges visitors to support environmental protection programmes, which could include IAS control (Environmental Levy Act 2015).
- **Fiji Environment and Climate Adaptation Levy (ECAL) 2020:** this is a consortium of taxes on prescribed services, items and income. This levy is a broader version of the Environmental Levy introduced in 2015. It is made up of 10% on importation of luxury vehicles, miscellaneous – inclusive of 10% charge on super yacht charters and docking fees; 10% income tax on individual earning of more than FJD 270,000; 20 cents levy on plastic bags; and 10% levy on prescribed services offered by business with a turnover of FJD 1.5 million. According to the Government of Fiji, ECAL has been used to support climate change and environmental conservation programmes (Marine Ecology Consulting 2020).

- Pristine Paradise Fee (Palau): this is technically a levy imposed on visitors through their tickets upon entering Palau (non-Palauan passport holders) where the revenue collected is used for environmental protection programmes.
- Maritime Levy (New Zealand): this levy applies to all New Zealand and foreign commercial vessels visiting New Zealand. The levy funds activities and services related to maritime safety and protection of the marine environment (The Maritime Levy 2019).

Examples from Other Regions:

- Costa Rica collects taxes from fuel (levy on sales at the petrol pump) and forestry-related activities to fund multiple environmental initiatives, including its *Pagos por Servicios Ambientales* Payment for Ecosystem Services scheme supporting land-owners to sustainably manage their land and forests (see Payment for Ecosystem Services below).
- In 2001, the Balearic Islands (Spain) implemented a 'tourist eco-tax.' The tax amounted to 2 euros per night-stay in tourist lodgings. In its first year, the tax collected 17 million euros. The revenue generated from the tax was funnelled into a fund, used to finance pre-specified environmental purposes (52% of funds went towards protecting natural area and parks to conserve their biodiversity).
- In Belize, the government introduced a conservation tax in the late 1990s on foreign tourists who visit Belize to enjoy the natural beauty of the country's forests, beaches and coral reefs. The proceeds from this tax (which stands at about USD 3.75 per person) are channelled into a conservation trust fund, the Protected Areas Conservation Trust, that finances the country's system of national parks and the conservation of Belize's natural resources.

4.1.3 Workability

Attribute	Description	Ranking		
		Low	Med	High
Potential	Ability to generate sustainable financing for IAS in these countries.			
Effort	Difficulty of implementation.			
	Availability for use.			
	Barriers to workability (e.g., admin costs, degree of regulatory support etc.).			
Capacity	Capacity of host country to implement.			

4.1.3.1 Potential

While taxes and levies provide a relatively stable source of revenue for a government, this does not always mean that things are certain. For example, all governments need to budget for contingencies for 'must have' expenditures (e.g., COVID-19 response and/or loss of government revenue caused by COVID-19) that can take precedence over what a government might regard as 'nice to have' budget allocations such as invasive species control. Governments also understand that there is a limit to how much tax burden can be imposed to achieve a well-functioning economy.

In the case of taxes and levies collected from foreign individuals and companies, the outlook is also uncertain. Tourism has dropped in the Pacific due to international lockdowns, and Covid-19 has also seen a significant decline in international trade. Many Pacific countries rely on trade and/or consumption taxes (e.g., import duties) for a significant proportion of government revenues. While the options for tax and levy revenue generation link to tourism (e.g., tourist tax) and imports (e.g., biosecurity clearance tax), the pandemic has exposed the fragilities of a globally interlinked world. To guard against future disruptions, securing diverse income streams (including from internal sources, and reliable international sources) will be key to the sustainable financing of IAS control, as well as other public good activities.

While levies are not a financing tool for IAS, they do have an important role in biosecurity cost-recovery. Rather than taxpayers financing activities that benefit an individual or groups, such as exporter and importers, the costs of keeping countries safe from IAS is borne by those which generate those risks. Revenue raised through transparent and fair levies assist in recovering costs throughout biosecurity systems – from surveillance through to dealing with any IAS and their destruction.

A more reliable, yet contentious, stream of tax or levy revenue could stem from Foreign Direct Investment (FDI) in the Pacific Island. For example, an environmental tax (e.g., for IAS control) on foreign companies operating in the Pacific.⁴ Environmental taxes can either be based on the ‘polluter pays’ principle, as development projects do tend to degrade the environment, and/or the ‘beneficiary pays’ principle (e.g., a tourist business benefits from pristine Pacific Island ecosystems).

While historically, restrictions on FDI have been ill-advised by the international community (for fear of scaring it away), there is a growing body of research warning that benefits accrue overwhelmingly to the foreign investing company, with limited ‘spill over benefits’ in the absence of a clear ‘FDI strategy’ to ensure local value capture. Moreover, the research shows that foreign investors will not necessarily shun countries that place restrictions or taxes on their activities (Chang and Garbel, 2015). The degree to which a host country can tax a multinational will, of course, depend on its relative bargaining position. Given the Pacific's unprecedented natural beauty, it may be at an advantage in exploring environmental taxes on FDI in the tourism sector – particularly because tourists are visiting precisely to access this natural beauty.

Existing and/or new extractive industries that cause environmental damage (such as forestry and mining) could also be taxed. As final example, China has an active interest in its companies' expanding infrastructure into the Pacific. China is not unfamiliar with a ‘win-win’ mindset and may be open to taxation as a condition for entry.

Notably, following a ‘return to normal’ with tourism and international trade the implementation of taxes and/or levies coupled with a levy on FDI would likely have stronger potential for sustainable financing for IAS control.

4.1.3.2 Effort

To implement a tax or levy to collect revenue requires legislation with specific empowering provisions to enable a government to do so. Typically, such powers are set out in regulations that outline the reason for and the amount of the tax or levy to be paid.

The most significant effort is the development of policy and consultation processes with affected parties. The use of levies also requires a thorough understanding of the ‘true’ costs associated with the need to recover these costs. As levies are imposed on third parties, these costs require the highest levels of transparency to ensure a fair and equitable system. Another significant effort is developing and passing the legislation that sets up the regulatory authority that will impose and collect levies. Once these powers have been enacted then there is less effort involved, other than ensuring that the regulatory authority has the right calibre of members who are supported by those with the skills and knowledge about cost recovery for biosecurity purposes. As levies are periodically reviewed, consultation needs to occur, and any changes gazetted.

⁴ Environmental taxes could be applied to new FDI, and to existing foreign investments. Even if, for example, a government promised a low or no levy to an initial investment, a levy can be implemented or adjusted once multinational firm has set up a plant (or resort in the case of a tourism company) in the country and can no longer pull out without losing its original investment.

4.1.3.3 Capacity

Departments need to have in-depth knowledge of the costs of biosecurity to ensure that costs are well understood. Given the financial aspect of this process, the relevant departments may seek to train personnel, but also seek the assistance from their respective finance departments in the collection of levies and their use.

4.1.3.4 Implementation Steps

As noted above, implementation is a process that starts with a policy paper setting out the case for the use of levies. After ministerial approval, affected parties are consulted on the rationale for the use of levies, before coming back to ministers for approval. Once approved, legislation is developed that provides the government authority for the collection of levies and the development of a regulatory authority for this purpose. The legislation sets out the areas which activities will incur levies, how third parties will pay, and review periods. It also sets out the governance of the regulatory authority, including which department will be responsible for overseeing the agency.

Once these legal components are established the regulatory agency is required to inform affected parties of the value of levies that will need to be paid. The regulatory agency will be required to gazette these levies and seek feedback from affected groups. Once this process is completed, levies are set and the process for collection begins.

4.2 FEES

4.2.1 Description

Fees can be charged if the nature of the service or function is appropriate, and the fee can be quantified and efficiently recovered. Fees can be used where a service or function is rendered to an individual and confers a benefit.

Examples of fees include:

- The call-out of experts to deal with biosecurity containment at a specific site (e.g., a container or quarantine facility).
- The use of fumigation at a particular site to eradicate invasive species. In both examples the importer is charged a fee, calculated as either as a fixed or hourly cost rate.
- The interception pest identification and disease diagnosis in Fiji, per diagnosis is currently set at FJD 276.32. (Biosecurity Authority of Fiji 2015).
- Inspection of vessels for safety and security rates, set at an hourly rate of NZD 245 (Maritime New Zealand 2021).

4.2.2 Workability

Like levies, once the legal authority to impose fees is established and systems set up to collected fees, the process is relatively simple. Fees are a useful component for biosecurity cost recovery. They are not a tool for the financing of IAS.

Attribute	Description	Ranking		
		Low	Med	High
Potential	Ability to generate sustainable financing for IAS in these countries.			
Effort	Difficulty of implementation.			
	Availability for use.			
	Barriers to workability (e.g., admin costs, degree of regulatory support etc.).			
Capacity	Capacity of host country to implement.			

4.2.2.1 Potential

Fees have a part to play in making those who generate risks to pay for the management of those risks. They are less about raising revenue, but rather recovering the costs associated with managing risks that may evolve, that requires adherence to standards, expert diagnosis, and the management of IAS at the border.

4.2.2.2 Effort

As with levies, the most significant effort is developing the legislative authority for the imposition and collection of fees.

4.2.2.3 Capacity

As with levies, capacity will need to be developed within the relevant agency responsible for the collection of fees.

4.2.2.4 Implementation Steps

As set out with levies. The process starts with policy, consultation, with affected parties, legislation, the establishment of a regulatory authority, and collection of fees in a transparent and accountable manner.

4.3 FINES

4.3.1 Description

Many countries impose fines on those who contravene biosecurity laws. These are typically instant fines with produce confiscated and destroyed and any further costs borne by individuals and importers. In the case of substantial breaches, court action can be taken where the courts can impose large fines and other penalties.

4.3.2 Examples

Among the most prevalent examples of the use of fines are for visitors who break the law by bringing in goods into a country unlawfully. While most of these are relatively small fines, substantially larger fines can be imposed by agencies taking those in breach of the law to face court proceeding. Other penalties can also be imposed.

4.3.3 Workability

Fines have a role to play as a form of punishment but also signal the need of people to abide by the law of the land. An important consideration is the administrative costs of imposing and collecting fines. Although workable as part of a biosecurity and other risk management systems, it is not a financing tool for IAS.

Attribute	Description	Ranking		
		Low	Med	High
Potential	Ability to generate sustainable financing for IAS in these countries.			
Effort	Difficulty of implementation.			
	Availability for use.			
	Barriers to workability (e.g., admin costs, degree of regulatory support etc.).			
Capacity	Capacity of host country to implement.			

4.3.3.1 Potential

Fines are not a financing tool for IAS, but a system of requiring those who break the law pay a cost.

4.3.3.2 Effort

Like levies and fees above, the ability to impose and collect fines requires legislative authority.

4.3.3.3 Capacity

Personnel and processes need to be established to enable the collection of fines.

4.3.3.4 Implementation Steps

As with levies and fees, fines require legislative authority and the ability to collect.

4.3.3.5 Consultation with Private Sector for Biosecurity

An examination of legislative and regulatory processes for biosecurity in the four countries (Marshall Islands, Niue, Tonga, and Tuvalu) indicated the important role of consultation as part of legislative and regulatory development (Tuvalu Department of Environment 2015; Republic of Marshall Islands 2000; Niue Government 2015; Tonga Department of Environment 2006).

A range of consultative methods were indicated as being used to engage with stakeholders most affected by the introduction, or further development, of biosecurity settings. Examples of consultation process identified include:

- Ministerial engagement with the regulatory agency.
- Departmental engagement with exporting and importing organisations, producers, and consumer groups.
- Wider societal participation using submissions to draft legislation and gazetting of new regulations and select committee consideration.

These processes have allowed governments to inform their rationale for biosecurity reform, and to hear the views of stakeholders about the impact of new measures on their industries. The following SWOT (strengths, weakness, opportunities, threats) analysis highlights the strengths, weaknesses, opportunities, and threats of current and potential of government consultation with the private sector.

SWOT Analysis of Consultation with Stakeholders

Strengths	Weakness
<ul style="list-style-type: none">• Ability to inform stakeholders about the need for biosecurity measures.• Ability of governments to hear the views from stakeholders regarding potential impacts.• Allows industry groups to prepare for changes, particularly in relation to the implementation of new or increasing levies and fees.• Wider societal support for new biosecurity measures.	<ul style="list-style-type: none">• Weaker relationships between the government and stakeholders from inadequate engagement, particularly if constructed as a 'take it or leave it' approach.• Mistrust of governments' intentions if role of biosecurity not adequately understood.• Difficulty of industry groups to absorb increased costs, leading to higher consumer prices.• Difficulty of industries to understand the role of biosecurity in the wider context of biodiversity, conservation, and IAS management.

Opportunities	Threats
<ul style="list-style-type: none"> Renewed and improved relationships between government and the private sector. The development of biosecurity processes and timelines that enables high quality adjustment to occur. Sustainable funding allowing for investment in high quality biosecurity processes, innovation, and capacity building. Involvement of the private sector in monitoring and evaluation of biosecurity systems. 	<ul style="list-style-type: none"> Strained relationships with industry groups if consultative engagement is inadequate and groups consider they are not being heard. Perception by stakeholders of the use of cost-recovery methods for biosecurity as a means of raising revenue for other purposes. Suspicion of perverse incentives of government to increase levies and fees if systems are not transparent and adequately accountable Negative economic impacts from unfettered use of levies and fees. Inadequate capacity building, and weak systems from lack of training if biosecurity systems are implemented too rapidly.

4.4 RESULTS-BASED PAYMENTS

4.4.1 Description

Results-based payments is a form of *ex-post* financing that has emerged in the past decade as a new way of disbursing development aid and funding for public services. Here funding is delivered based on pre-agreed (measured) outcomes determines and disbursed after those outcomes have been delivered. This distributes a higher proportion of delivery risk to the supplier of these outcomes (compared with grants) thereby reducing non-delivery risk to the funder. This also creates a cash flow challenge for the supplier who may need to borrow funds to deliver the first tranche of outcomes to receive the first set of results-based payments.

In the context of international development, results-based payments include Payment by Results (PbR), Results-Based Lending (RBL), performance-based aid, performance tranches in budget support, Cash on Delivery (CoD), Output-Based Aid (OBA). In the context of government provision of public services, results-based financing is referred to as Payments for Outcomes (PFO).

Results-based financing modalities require that:

- Results are defined in advance.
- The service provider is free to design the methodologies and processes by which those results will be achieved.
- Payment is released contingent on the delivery of measured and reported outcomes by the service provider.

In this respect, results-based payments are similar to a bond. The key difference is that results-based payments typically refer to two-party contracts between the 'buyer' (e.g., a national government in the case of PFO, or a donor in the case of PbR) and the service provider. A bond on the other hand functions as external finance from an investor.

Results-based payments represents "a cultural paradigm shift" from traditional donor and government procurement based on input and activity costs (e.g., effort), to the purchase of measured outcomes. While the service provider in results-based payments carry additional risk, they also typically gain the advantage of much greater control over how the outcomes are delivered.

Its proponents highlight two advantages:

- Demonstrates the impact of funds more transparently.
- Incentivises providers to be more innovative and efficient at delivering outcomes, resulting in better outcomes for the beneficiaries and more value for money for the funder.

The potential for results-based financing depends on two key considerations:

First, results-based financing is typically not designed to be in perpetuity (i.e., it is designed to last for the duration of medium-term projects, 5-7 years). This means that it would not, at least alone, be appropriate for IAS control activities such as border control and IAS activities that require on-going implementation beyond the medium-term. Results-based financing is most suited to projects with a specified length (e.g., eradication of an IAS from a particular area), or to cover the initial establishment costs of a longer-term project.

Second, reviews of results-based financing initiatives have highlighted that it can sometimes compromise impact whereby:

- The pressures of results-based contracts can shutdown innovation, in favour of taking a ‘safety-first approach.’
- Failure to deliver locally relevant outcomes, as these are typically selected in a top-down manner, with limited or no engagement with intended beneficiaries.
- Crowding out smaller players, such as social enterprises, NGOs and community groups, from being service providers (as time, expertise and financial expense is required to first tender, and then deliver on impact transparency and reporting).

To guard against these downfalls, good practice recommendations have emerged whereby:

- Outcomes should be co-identified with target communities to ensure they deliver locally relevant impact.
- Results frameworks need to be built around accountability and learning.
- Outcomes should be sufficiently broad and long-term to provide room for experimentation and innovation.
- Local smaller scale service providers (e.g., social enterprises and community-based NGOs) should be involved where possible.

4.4.2 Examples

Climate Action through Landscape Management project in Ethiopia.

The Climate Action through Landscape Management (CALM) project⁵ is a results-based contract between the World Bank and the Government of Ethiopia. The key outcomes purchased by the World Bank are:

- i. The adoption of sustainable land management practices.
- ii. Expanded access to secure land tenure in rural areas.

These outcomes will be met by implementing participatory watershed management plans in up to five thousand watersheds of the Ethiopian highlands, the issuance of up to eight million landholding certificates, and the functioning of a modern land register in participating communities.

Funding for these outcome-pathways will initially come from the Government of Ethiopia and will be incentivised by the payment of a USD 5million grant from World Bank, sequenced over a 5-year period contingent on meeting milestone outcomes.

Notably, the overarching purpose of the contract is to expand the area of the Ethiopian highlands covered by the Sustainable Land Management Project (SLMP), a larger World Bank project that aims to reduce land degradation and improve land productivity in selected watersheds in targeted regions in Ethiopia. At the end of CALM, another key outcome is to expand the SLMP from 7 to 20% of land classified as significantly degraded in Ethiopia.

⁵ <https://projects.worldbank.org/en/projects-operations/project-detail/P170384>

4.4.3 Workability

Attribute	Description	Ranking		
		Low	Med	High
Potential	Ability to generate sustainable financing for IAS in these countries.			
Effort	Difficulty of implementation.			
	Availability for use.			
	Barriers to workability (e.g., admin costs, degree of regulatory support etc.).			
Capacity	Capacity of host country to implement.			

4.4.3.1 Potential

Results-based payments for IAS outcomes have moderate potential for sustainable financing.

4.4.3.2 Effort

The key challenge is to find an entity sufficiently at financial risk from invasive species to warrant their participation as a funder/buyer of results-based outcomes. Alternatively, if a direct participant cannot be found (i.e., with direct exposure to the costs of IAS risk) then an indirect participant will need to be found with a predominantly philanthropic motivation combined with a preference for a payment for results approach to funding.

4.4.3.3 Capacity

There is limited capacity in most PICTs to set up a results-based payments alone, but with appropriate external partnerships such an approach is possible. Furthermore, as a host country gains experience for operating this revenue stream option its ability to undertake this without external support will increase through time.

4.4.3.4 Implementation

Implementation steps include:

- Develop a plan for a results-based payment system that identifies/defines:
 - Target outcome to be funded.
 - Target ‘buyer’ who has a mandate to seek the targeted outcome. Buyer could be a donor that wants to transition away from higher risk grant funding to lower risk grant funding and willing to do so in an on-going basis.
 - Measurement, reporting and verification system.
 - Financial transaction protocols.
- Approach the target ‘buyer’ with proposal and proceed to negotiations

4.5 PAYMENT FOR ECOSYSTEM SERVICES

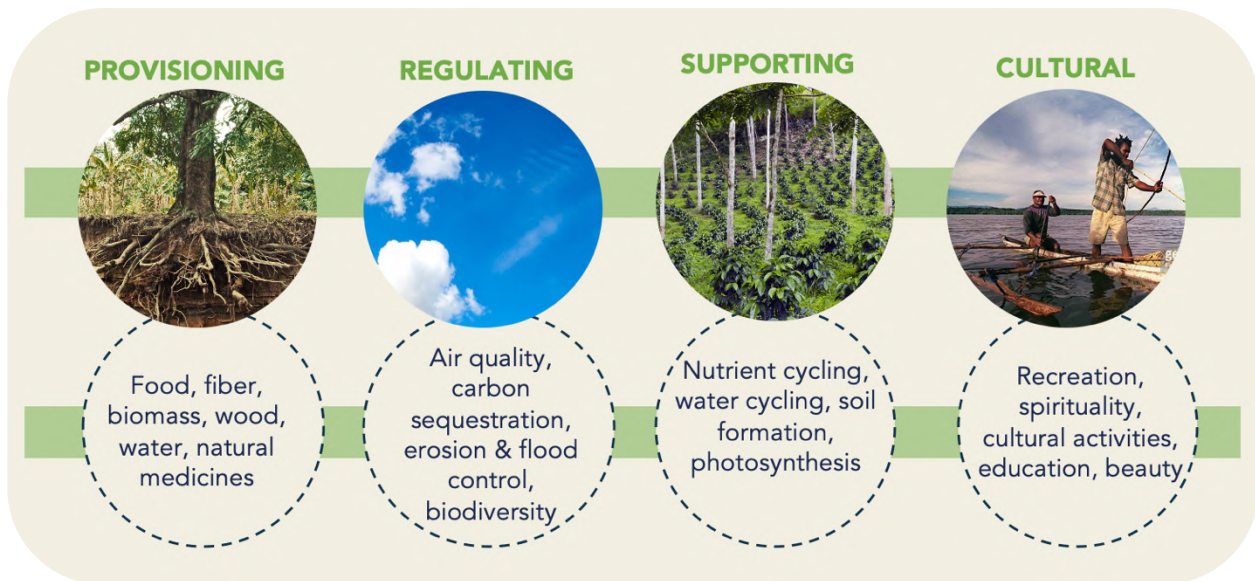
4.5.1 Description

Payments for ecosystem services (PES) are a variant on results-based payment systems that focus on the delivery of ecosystem services in an *ex post* payment arrangement.

4.5.1.1 Ecosystem Services

The relationship between ecosystem services and human wellbeing was elaborated in detail in the Millennium Ecosystem Assessment (2005) and has informed environmental policy and financing ever since. This involves partitioning ecosystem services into a series of categories that align with categories of human wellbeing as shown in Figure 4.5.1.1 below.

Figure 4.5.1.1. Types of ecosystem service.



In the Millennium Ecosystem Assessment (MEA) framework, ecosystem services are divided into four main types:

1. Supporting services are the underlying natural processes, such as photosynthesis, nutrient cycling, the creation of soils, and the water cycle, that support all life. These services differ from the other ecosystem service types in that their impacts on people are either indirect or occur over a very long time.
2. Provisioning services are benefits that nature provides to meet core human needs, such as nutritious food, health and shelter.
3. Regulating services consist of ecosystem processes essential for the ongoing perpetuation and sustainability of ecosystems.
4. Cultural benefits comprise nonmaterial benefits people obtain from ecosystems.

Each of these ecosystem service types link in various ways to five MEA categories of human wellbeing:

1. Security.
2. Basic material for good life.
3. Health.
4. Good social relations.
5. Freedom of choice and action.

4.5.1.2 Ecological Infrastructure

Ecological infrastructure is an ecosystem that delivers ecosystem services. Like engineering infrastructure, ecological infrastructure delivers beneficial services to human wellbeing but can only continue to deliver these services when there has been sufficient investment in the production and maintenance of the ecological infrastructure itself.

4.5.1.3 Payment for Ecosystem Services

Ecosystems do not charge for their services. There is, however, a human labour and technology cost of protecting and enhancing ecosystems. Paying for this human labour and technology cost is termed 'payment for ecosystem services' and is how this term is defined in this report.

This 'payment' theme refers to the core conservation cost principles elaborated in Section 2.2.2:

- Capital expenditure.
- Operational expenditure.
- Opportunity cost.

PES is widely recognised as a novel and innovative revenue mechanism for environmental protection. Today, PES is often used as an umbrella term for the entire range of market-based instruments that generate payments for the conservation of ecosystem services, including, for example, carbon markets and biodiversity markets (discussed further in Sections 4.6 and 4.7). For this report, PES is defined in its original sense as schemes that do not rely upon a formal market, but rather upon a *continual series of payments to landowners, members of a community, and/or conservation organisations in exchange for them taking on the responsibility to manage ecosystems in a specified natural area to enhance ecosystem service delivery*.

Frequently, the buyers of PES are the direct beneficiaries of ecosystem services. For example, downstream water users in a city might pay for appropriate watershed management on upstream land. Buyers, however, need not have any direct connection to or benefit from the ecosystem services they pay for. Buyers in this category may have other incentives for PES such as:

- A foreign government might pay for a community in a developing country to manage ecosystems as part of international aid obligations.
- A corporation might engage in PES for the purpose of enhancing their social license to operate.

Notably, whether the buyers of PES are direct or indirect beneficiaries (or not beneficiaries at all) of ecosystem services, the underlying rationale for PES remains the same: if ecological infrastructure is left to degrade, its ability to deliver beneficial ecosystem services (and consequent human wellbeing outcomes) will also degrade. Environmental management of ecosystems comes at a cost (capital expenditure, operational expenditure, opportunity cost), and if these costs can be met through a PES payment system, then the ecological infrastructure can be protected and enhanced.

As above, payments for PES projects are typically made *ex post* for the *delivery of ecosystem services (environmental management outcomes)*. There are, however, no hard and fast rules as to *when* payments must be made, nor *what* payments must be for. Of such, PES schemes can be designed by sellers and buyers with a degree of flexibility to meet their needs. For example, upfront payments could be made to support the initial implementation of a PES project, or payments could be made for activities that are indirectly linked to the delivery of ecosystem services (e.g., education programmes for communities and/or schools to raise awareness of IAS and their impacts). Notably, if payments are confined to *ex post*, it will be important for a PES project to secure external grant funding or investment (e.g., a loan) to support upfront implementation costs (see Implementation below).

Key principles guiding PES:

- i. **Voluntary:** stakeholders enter into PES agreements on a voluntary basis.
- ii. **Targeted:** specific measurable outcome delivery.
- iii. **Direct and ongoing payment:** payments are made directly to environmental management service providers for the duration of the project period or agreed payment period.
- iv. **Additionality:** payments are made for actions over-and-above those which normally be funded by other means.
- v. **Conditionality:** payments are dependent on the delivery of measured, reported and verified ecosystem service benefits.
- vi. **Ensuring permanence:** management interventions paid for by beneficiaries should not be readily reversible, thus providing continued service provision.
- vii. **Avoiding leakage:** PES schemes should be set up to avoid leakage, whereby protection of the project ecosystem does not cause ecosystem degradation to shift to another location.

- viii. **Adaptive:** To guarantee long-term sustainability, PES projects should be flexible, dynamic, and capable of both learning-by-doing and of adapting to changing political, social, and environmental contexts.

4.5.2 Examples

PES schemes have two key metrics:

1. Type of ecosystem service protected or enhanced through environmental management.
2. Who pays for the environmental management?

PES programmes are typically based on four types of ecosystem services: carbon sequestration, biodiversity, watershed protection, and marine-related ecosystem services. Notably, because invasive species can disrupt each of these PES options, IAS control can perform an important, if not central, component of successful PES outcomes. Table 4.5.2 provides an overview of each of the four main types of ecosystem services targeted by PES, including examples relevant to the Pacific Islands of IAS integration.

Table 4.5.2. Types of ecosystem service targeted by PES programmes.

Type of PES programme	Description	Examples of potential IAS control integration
Carbon sequestration	The conservation and/or regeneration of forests, grasslands, mangroves, seagrass and other ecosystems can remove significant amounts of carbon dioxide from the atmosphere. Notably, PES schemes that focused on carbon sequestration benefits may elect to generate revenue on carbon markets by validating the amount of carbon sequestered and generating carbon credits for sale (see <i>Carbon markets</i> below). Notably, carbon focused PES schemes are increasingly common as governments and corporates globally invest in meeting carbon reduction targets in line with the 2015 Paris Agreement to keep global warming below 2 °C.	Recent research suggests that non-native trees accelerate carbon loss from the soil due to rapid decomposition rates, relative to natives (i.e., they have fast carbon cycling) (Waller et al. 2020). This suggests that long-term carbon capture will be maximised by replacing exotic forest with natives. More generally, PES programmes targeting native forest regeneration often have an invasive control element to reduce competition and to support natives to grow.
Biodiversity	PES programmes to enhance biodiversity are related to several ecosystem services, such as food provisioning, water purification, genetic resources and climate regulation. Similar to carbon focused PES, biodiversity focused PES may to generate revenue on the emerging bio-credit market (see <i>Bio-credits</i> below). Again, the creation and sale of credits is not a necessary element of PES.	A recent project implemented by the International Union for Conservation of Nature for SPREP on managing marine and coastal biodiversity identified PES as a viable option. Given that IAS are compromising biodiversity in Pacific Island marine environments, as they compete with native species and alter habitats, there is opportunity for this project to incorporate a strong IAS component.
Watershed protection	A common type of PES scheme globally. These schemes involve paying upstream landowners to maintain or modify a particular land use which is affecting the availability and/or quality of the downstream water resource.	The Vaisigano River Catchment Programme in Samoa is focused on increasing the climate resilience of the catchment. It has PES element to it, a “cash-for-work option” for locals. While the ‘work details’ of this option could not be identified, there is an opportunity for payments to remove “Woody weed infestations” identified as a driver of forest degradation and unstable land by a prior scoping study (Weaver and Henderson, 2019).

Marine-related ecosystem services	Marine ecosystems provide a host of ecosystem services, associated with their regulatory and habitat functions, such as pollution control, storm protection, flood control, habitat for species, and shoreline stabilisation. Notably, marine ecosystems also have impressive carbon sequestration capabilities (up to 50 times on-land ecosystems).	Tanzania’s Marine Legacy Fund derives revenues from commercial fishing licences, marine ecotourism revenue sharing, and oil and gas taxation. The fund is used to make regular payments to coastal communities in exchange for their services in protecting and enhancing marine ecosystems.
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There are three broad categories of potential buyers for PES programmes: public, private, and mixed buyer (or hybrid) models.

Buyer	Types of buyers in category	Examples
Public: A government pays land or resource managers to enhance ecosystem services.	<p>National government: Public payment schemes through which the government pays land or resource managers to enhance ecosystem services on behalf of the wider public. Payments are made from public taxes, which typically are allocated to a fund for the purpose of PES management.</p> <p>Donor government: Aid budgets from donor governments can be used for the on-going financing of PES projects in developing countries.</p>	China’s Sloping Land Conservation Program: The Chinese government paid an estimated 120 million Chinese households to convert steep cropland to forest and grassland to regenerate ecosystem services (erosion and slip control, water retention, carbon sequestration). Total payments were USD 69 billion between 1999 and 2014.
Private Self-organised private deals in which beneficiaries of ecosystem services contract directly with service providers.	<p>Corporations: Large corporations that depend on ecosystem services, such as those in food, energy and water service sectors, see PES as an important pathway to preserving the underlying ecosystems on which their businesses depend to thrive (see Nestlé Example adjacent). Other corporates, including those not directly reliant on ecosystem services, see PES as a means to advance their social and environmental responsibility, license to operate, and reputation as ‘sustainable players’ in the global economy. A third driver of corporate involvement is government regulation.</p> <p>Philanthropic organisations: While a less common source of revenue for PES, there are opportunities for philanthropic trusts or foundations with an interest in a particular ecosystem to pay for the protection of it and its services.</p>	<p>Nestlé Waters PES for farmers in France (2006): To address the risk of nitrate contamination caused by agricultural intensification in Vittel (north-eastern France) Nestlé Waters, a world leader at the time in bottled mineral water, paid farmers in the catchment to change their farming practices to improve and protect the catchments water quality.</p> <p>Danone’s Livelihoods Carbon Fund (2020): With a deployment target of €100 million and the aim to improve the lives of 1.5 million beneficiaries in developing countries, this new fund will invest in community-based solutions for the restoration of natural ecosystems, agroforestry, and regenerative agriculture.</p> <p>PES scheme in Vietnam: The Government of Vietnam’s Decree 99 legally mandates private hydropower companies to pay into a state managed fund for forest restoration in upper watersheds.</p>
Hybrid model Multiple buyers to pay land or other resource managers for	PES programmes can be funded from multiple sources, including a mixture of both public and private buyers. Typically, mixed revenue stream models involve the establishment a special purpose fund to collect revenue from multiple sources, and to	Bolsa Floresta in Brazil: This is widely considered as the biggest PES programme in the world. It pays families living in protected areas in exchange for their support to regenerate the environmental services provided by tropical forests. The programme was funded by the Amazonian Fund (inputs from The

the delivery of ecosystem services.	make regular distributions to identified ecosystem stewards or managers.	Brazilian National Development Bank, Government of Norway, German Government, and several large corporations). The fund size totalled USD 1.2 billion. Costa Rica's Pagos por Servicios Ambientales PES scheme (1997): Landowners receive direct payments for the environmental services that their lands produce when adopting sustainable land-use and forest-management techniques. Partly financed by the state through a consumer tax, but also involves voluntary payments made by 41 private firms. The Global Environment Fund (GEF) also financed USD 8.3 million and leveraged an additional USD 51.9 million in co-financing for this project.
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4.5.3 Workability

Attribute	Description	Ranking		
		Low	Med	High
Potential	Ability to generate sustainable financing for IAS in these countries.			
Effort	Difficulty of implementation			
	Availability for use.			
	Barriers to workability (e.g., admin costs, degree of regulatory support etc.).			
Capacity	Capacity of host country to implement.			

4.5.3.1 Potential

PES has high potential to generate sustainable financing for any activity related to enhancing biodiversity because it can combine multiple revenue streams (e.g., taxes and grants from multilateral sources). The control of invasive species is already a core component in all four main type of PES programmes (carbon, biodiversity, watershed and marine). Because IAS have such a significant impact on ecosystems, they can form the centre of a PES initiative.

As the examples above illustrate, PES programmes are typically implemented by the landowners or communities where the ecosystem damage is occurring, or where there is potential for ecosystems to add value or reduce risk to another party.

4.5.3.2 Effort

The effort involved in developing a PES project tends to require partnerships between local entities and external service providers with experience in PES projects.

Key steps:

1. Identify PES services to be sold/transacted. Main challenges:
 - a. Well defined geographic boundaries
 - b. Clear alignment between proposed activity and IAS control outcomes expected.
2. Identify PES sellers and buyers. Main challenges:
 - a. Unclear land tenure.
 - b. Competing land uses.
 - c. Agreement on how to price the PES project.
3. Clarify project governance arrangements. Main challenges:
 - a. Insufficient existing governance structures in host community requiring community governance upgrade.

- b. Ineffective institutions to manage sales of PES outcomes and measure progress.
- 4. Define MRV protocols. Main challenges:
 - a. Low capacity in local communities to design and implement MRV systems.

4.5.3.3 Capacity

Likely requires a partnership arrangement between local actors with low capacity and external actors with considerable experience, particularly in the early stages, but also potentially in the long term.

4.5.3.4 Implementation

Implementation steps for PES project development in the target countries:

1. Seek grant funding to undertake a high-level scoping study to evaluate potential for PES project development in proposed natural area.
2. Identify potential sellers (interested in delivering ecosystem services in the proposed natural area) and buyers (interested in buying the ecosystem services generated).
3. Agree baseline of the natural area to be protected and/or regenerated and project parameters with PES buyer/funder entity. Baseline acts as a reference for future monitoring of the contractual obligations of the service provider in preserving natural areas.
4. Design project and MRV protocols in communication with buyer/funder entities.
5. Undertake project development/establishment for the identified natural area.
6. Implement project.
7. Verify periodic project monitoring reports (either verified by buyer/funder entity or a third party).
8. Disburse revenues according to benefit-sharing plan and associated agreements.

4.6 CARBON MARKETS

4.6.1 Description

Carbon markets involve the production and sale of carbon credits from projects that deliver carbon benefits to the atmosphere. The demand for carbon credits is driven either by regulatory obligations (the compliance carbon market) or voluntary offsetting by businesses, organisations, and products seeking to go net zero carbon (voluntary offsets market). This section focuses on the voluntary offsets market.

Projects supplying carbon credits into the voluntary offsets market can be fully funded for the project period without any need for grants, or where grant funding plays a co-financing role. Project periods vary but range from 30-100 years or more depending on the activity type.

The international carbon market has steadily increased in value since 2005 with current cumulative value standing at close to USD 7 billion, with the majority of carbon credits produced in Asia – Oceania being the lowest producer (Ecosystem Marketplace 2021).

4.6.1.1 Carbon Standards

An underlying feature of carbon projects is the quality assurance system behind carbon credit production. The different standards operating in the international voluntary carbon market are shown in Table 4.6.1.1.

Table 4.6.1.1. Transacted voluntary carbon offset volume and average price by standard. Source: Ecosystem Marketplace 2021.

	2019		2020		To August 2021	
	Vol: MtCO2	Price/tCO2 (USD)	Vol: MtCO2	Price/tCO2 (USD)	Vol: MtCO2	Price/tCO2 (USD)
American Carbon Registry (ACR)	2.5	\$5.36	5.4	\$8.44	2.0	\$11.37
Clean Development Mechanism (CDM)	4.9	\$2.02	7.0	\$2.19	8.2	\$1.13
Climate Action Reserve (CAR)	4.0	\$2.34	2.1	\$4.44	4.9	\$2.12
Gold Standard	13.2	\$5.27	13.9	\$4.57	5.2	\$3.94
Plan Vivo	0.9	\$8.99	1.2	\$8.49	0.7	\$11.58
Verified Carbon Standard (VCS)	44	\$1.74	66.1	\$3.76	125.6	\$4.17

Carbon standards that are applicable to projects in the Pacific Islands with IAS components include:

Standard	Weblink
Gold Standard for the Global Goals	https://www.goldstandard.org/articles/gold-standard-global-goals
Plan Vivo Standard	https://www.planvivo.org/
Sustainable Development Verified Impact (SD VISTA) Standard (operated by Verra):	https://verra.org/project/sd-vista/

4.6.1.2 Activity Types

The activity types available in the voluntary carbon market are shown in Table 4.6.1.2. As can be seen forestry and land use has delivered the highest volume in 2021.

Table 4.6.1.2. Voluntary Carbon market size by project category 2019-August 2021. Source: Ecosystem Marketplace 2021.

	2019			2020			To August 2021		
	Vol: MtCO2	Price/tCO2 (USD)	Value (USDm)	Vol: MtCO2	Price/tCO2 (USD)	Value (USDm)	Vol: MtCO2	Price/tCO2 (USD)	Value (USDm)
Forestry & Land Use	36.7	\$4.33	\$159.1	48.1	\$5.60	\$269.4	115.0	\$4.73	\$544
Renewable Energy	42.4	\$1.42	\$60.1	80.3	\$0.87	\$70.1	80.0	\$1.10	\$88.4
Energy efficiency/Fuel switching	3.1	\$3.87	\$11.9	31.4	\$1.03	\$32.3	16.1	\$1.57	\$24.2
Agriculture	-	-	-	0.3	\$9.23	\$2.8	3.4	\$1.36	\$4.6
Waste disposal	7.3	\$2.45	\$18.0	8.3	\$2.76	\$22.9	2.7	\$3.93	\$10.6
Transportation	0.4	\$1.70	\$0.7	1.1	\$0.64	\$0.7	2.1	\$1.00	\$2.1
Household devices	6.4	\$3.84	\$24.9	3.5	\$4.95	\$17.3	1.8	\$5.75	\$10.4
Chemical processes/ industrial manufacturing	4.1	\$1.90	\$7.7	1.3	\$1.90	\$2.5	1.1	\$3.22	\$3.5

Project types relevant to IAS control activities include:

1. Forests

- a. Reforestation (carbon is taken out of the air and stored in a forest).
- b. Improved forest management (e.g., reducing and/or avoiding emissions from the degradation of forests).
- c. Avoided deforestation (avoiding emissions from deforestation).

- d. Mangrove reforestation and avoided deforestation.
- 2. Wetlands
 - a. Avoided draining of wetlands.
 - b. Rewetting wetlands.
- 3. Blue Carbon
 - a. Tidal seagrass restoration.
 - b. Saltmarsh conservation.

The activity type most directly relevant to terrestrial IAS control is Improved Forest Management where the control of invasive herbaceous vines (e.g., *Merremia peltata*) is used to enhance the regeneration of natural forest.

Activity types indirectly relevant to IAS control could include all the above and others including:

- Agricultural projects
- Grassland projects

Where IAS control is an indirect activity in a carbon project, the IAS control activity may only contribute a minor component of the direct carbon benefits but can form a major component of project management plans funded by the carbon credit cash flows.

4.6.2 Examples

4.6.2.1 Sustainable Pest & Weed Control Funding Through the New Zealand Emissions Trading Scheme

Indigenous forest carbon projects in the New Zealand Emissions Trading Scheme involve reforestation of non-forest land with native forest species. Indigenous forest carbon projects often need to include pest and weed control during forest establishment to reduce the risk of the planting project failing. Such projects can elect to continue such control for on-going biodiversity enhancement, particularly for project proponents motivated by biodiversity conservation interests.

Specific examples of indigenous forest carbon projects that include pest and weed control during forest establishment and in on-going biodiversity enhancement include:

- Manapouri Lake Control Forest Carbon Project, Southland.
- Huruiki Forest Carbon Project, Northland.
- Kanuka Hill Forest Carbon Project, Golden Bay.
- Rameka Forest Carbon Project, Golden Bay.
- Westwind Forest Carbon Project, Wellington.
- Makara Forest Carbon Project, Wellington.
- Kern Creek Forest Carbon Project, Tasman District.

Increasing budgets for pest and/or weed control (e.g., to deliver greater beneficial impact or address a large pest/weed problem) can be funded by either reducing budget lines in other areas of the carbon project (where possible) or raising the carbon price (charging a premium for the biodiversity co-benefits).

For example, a financially viable and self-sustaining reforestation carbon project in New Zealand can be delivered with a NZD 700,000 loan at a 4.0% interest rate from an impact investor. The project has 50 hectares of indigenous forest and 50 hectares of exotic plantation woodlot.

The original business model has pest control budget of NZD 50/ha/yr over 50 years (rising with inflation) for the native forest area.

If the same project were to increase the pest control budget to NZD 350/ha for the first three years (to eliminate an IAS) and then maintain a pest control budget of NZD 100/ha/yr for the remainder of the 50 years, the project is still a financially viable investment provided NZD 15,000 is added to the original loan (bringing

the loan to NZD 715,000). This is without a carbon credit carbon price premium (i.e., selling carbon credits at the NZU spot price of NZD 70.00 per carbon credit and rising at NZD 1.50 p.a.).

By adding a modest price premium of an additional NZD 2.50 per carbon credit, the project can afford an on-going (i.e., 50-year) pest control budget of NZD 500/ha/yr and remain financially viable and independent of grant funding.

The carbon buyers for the above projects are voluntary carbon buyers (businesses, organisations, schools, and products) seeking to go ‘net zero carbon’ in the voluntary offsets market. These buyers are predominantly motivated by a desire to do good rather than a desire to access the cheapest carbon credits possible. For this reason, this market is willing to pay premium prices for carbon credits from projects with high biodiversity co-benefits. These premium prices can sustain higher-cost projects that require additional spending on IAS control.

4.6.2.2 Pacific Islands

There are several indigenous forest carbon projects in the Pacific Islands and more in development. Conservation management (i.e., beyond just carbon benefits) is a key element in project business plans and management plans for projects designed to maximise biodiversity benefits.

Examples include:

- Drawa Forest Carbon Project, Fiji.
- Loru Forest Carbon Project, Vanuatu.
- Babatana Forest Carbon Project, Solomon Islands.
- NIHT Topaiyo REDD+ Project, PNG.

The international carbon standards being used for the above projects are the Verified Carbon Standard and the Plan Vivo Standard. The Verified Carbon Standard has a co-benefit standard for nature-based solution projects in the form of the Climate Community and Biodiversity (CCB) standard. The Plan Vivo standard has community and biodiversity requirements as a core element.

Commodifying Nature or Not

Carbon market approaches to conservation are sometimes criticized for “commodifying nature”. This is not always correct. Nature has long been commodified (wood, minerals, sale of rare species) and conservation efforts (whether market-based or grant-funded) are usually an attempt to disrupt this type of commodification. Furthermore, carbon projects that include invasive species control need not put a price on nature. Carbon projects do, however, put a price on the human labour and technology cost to look after nature. The pricing of human labour and technology to look after nature is undertaken all the time in grant funding and is not controversial.

4.6.3 Workability

Attribute	Description	Ranking		
		Low	Med	High
Potential	Ability to generate sustainable financing for IAS in these countries.			
Effort	Difficulty of implementation.			
	Availability for use.			
	Barriers to workability (e.g., admin costs, degree of regulatory support etc.).			
Capacity	Capacity of host country to implement.			
	Capacity of external partnerships to enable			

4.6.3.1 Potential

Carbon market approaches have high potential for sustainable financing of IAS projects in or linked to forests. The opportunity in each of the target countries will depend on their availability of land that is suitable for carbon project development. This is particularly challenging for atoll nations but not impossible, and less so for those with larger land masses. Niue for example, has a forest carbon project opportunity in its forested interior – an opportunity scoped by Ekos in 2007.⁶

4.6.3.2 Effort

Carbon projects are complex and challenging both technically and financially. As such, they tend to require considerable effort and expertise to undertake. But once they are started, they can be maintained with much lower effort than the project establishment. Furthermore, after an initial project is completed, additional projects can be added with much less effort due to the setup effort associated with the first project.

4.6.3.3 Capacity

There is ample capability and capacity in the international sphere for foreign partner entities to work with local counterparts to create carbon project opportunities. A detailed carbon project scoping exercise in each country would shed light on actual opportunities.

4.6.3.4 Implementation

Implementation steps for carbon project development in the target countries:

1. Seek grant funding to undertake:
 - a. A high-level scoping study to evaluate potential for carbon project development (forests, agriculture, blue carbon). Outcome: short list of possible pilot projects.
 - b. Up to three pilot project scoping studies. Outcome: Readiness to seek project development funding to undertake pilot projects.
2. Detailed scoping study for each pilot project. Outcome: Investment readiness for viable pilot projects. Able to register project with carbon standard.
3. Recruit project developer to assist in fundraising.
4. Determine a preferred sustainable financing modality (type of investment) to fund project development. Options for sustainable financing modalities presented in Section 5 (e.g., combination of catalytic capital in the form of a grant combined with impact investment). Outcome: Investment strategy.
5. Design capital structure for investment vehicle.
6. Undertake fundraising.
7. Undertake project development.
8. Validate Project Description (containing project business plan and management plan).
9. Implement & monitor project.
10. Verify periodic project monitoring reports.
11. Issue carbon credits.
12. Monetise carbon credits through a carbon credit reseller identified in the Project Description).
13. Disburse revenues according to benefit sharing plan and associated agreements (including debt-servicing).

⁶ Ekos led a forest area change assessment for Niue in 2007 using remote sensing data and prepared a proposed forest carbon project for avoided deforestation and/or avoided forest degradation at that time. This was a response to the Niue national forest policy of 2000 that aimed for the conservation and sustainable land use of the remaining forests of Niue.

4.7 BIODIVERSITY CREDITS

4.7.1 Description

Biodiversity credits are like carbon credits but where the core ecosystem service delivered is a biodiversity benefit rather than a carbon benefit. While biodiversity credits are a market instrument, the biodiversity credit market is far less developed than the carbon market. Examples of potential biodiversity market buyers include companies that seek to undertake corporate social responsibility (CSR), where corporate sponsorship is structured as the purchase of measured, reported and verified outcomes rather than speculatively funding project inputs (funding inputs is the normal form of corporate sponsorship). This could include businesses located in the Pacific Islands with an interest in linking their brand with biodiversity conservation (e.g., hotels, tourism operators, airlines) or businesses located in donor countries who may have supply chains in the Pacific Islands.

Like carbon market projects, projects that produce biodiversity credits can be fully funded for the project period without any need for grants, or where grant funding plays a co-financing role.

4.7.1.1 Biodiversity Offsets versus Biodiversity Credits

Biodiversity offsets are a concept whereby biodiversity loss in one location is compensated for (offset) through biodiversity gains elsewhere (sometimes referred to as 'biodiversity banking'). Between USD 2.6 billion and USD 7.3 billion in finance was delivered through biodiversity offsets in 2016 (see Bennett et al 2017). One of the key advantages of biodiversity offsets is the ability to secure demand from buyers who are compensating for biodiversity damage/loss the buyer is causing elsewhere.

There are also disadvantages to biodiversity offsets. If biodiversity units are to be used as offsets, there is a high burden of proof that the transaction delivers no net loss to nature (see OECD 2014). This requires high resolution measurement, reporting and verification (MRV) for both the consumer and the seller. This is far more straightforward for carbon accounting because the common metric is 1 tonne of CO₂. Biodiversity on the other hand is not as easily reducible to a like-for-like unit.

For this reason, biodiversity credits can also be understood as a unit of biodiversity conservation that has been measured, reported and verified and available for purchase by those who want to cause that biodiversity conservation outcome (without it being an offset). This has the advantage of not needing to demonstrate no net loss but has the disadvantage of lower demand from buyers because such buyers are not trying to compensate for damage done elsewhere.

This section focuses on biodiversity credits that are not used as biodiversity offsets.

4.7.1.2 Standards

In recent years biodiversity credits have been subsumed into the broader framework of the UN Sustainable Development Goals (SDGs) by some standards in the conservation markets.

The standards available for use for the creation of biodiversity credits include:

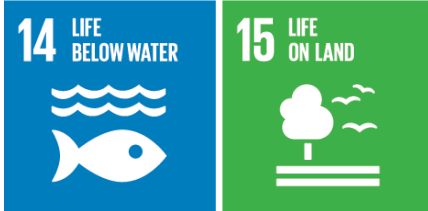
Standard	Weblink
Gold Standard for the Global Goals	https://www.goldstandard.org/articles/gold-standard-global-goals
Plan Vivo Standard	https://www.planvivo.org/
Sustainable Development Verified Impact (SD VISta) Standard (operated by Verra):	https://verra.org/project/sd-vista/

These standards have options for certifying projects as delivering one or more of the SDGs without the issuance of tradable credits and the option to issue biodiversity (or other) SDG credits for trading. The level of

due diligence required for the issuance of credits is higher than the option to certify a project as delivering SDGs.

4.7.1.3 Activity Types

A broad range of activity types are possible under the SDG framework, focusing on those SDGs most relevant to biodiversity:



IAS control activities can fall into either of these SDG categories.

4.7.2 Examples

4.7.2.1 Biodiversity Offset Schemes

Biodiversity offset schemes are operated in some countries including:

- The biodiversity offset element of the US Water Act
- The Biodiversity Offset Scheme (BOS) in Australia: <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/offset-obligations-and-credit-trading/biodiversity-offsets-scheme-public-registers>
- The Natural England Biodiversity Offset Scheme in the UK: <https://cieem.net/ne-biodiversity-credits-scheme/>.

4.7.2.2 Biodiversity Credit Schemes

Information on biodiversity credit schemes is limited, partly because financing these schemes is more challenging than financing biodiversity offsets. Examples from New Zealand include projects operated by and/or developed by Ekos:

- The Rarakau Forest Carbon Project in Southland (biodiversity credits first transacted in 2014).
- The Sanctuary Mountain Maungatautari Biodiversity Credit project in the Waikato (project in development).
- A tidal wetland/saltmarsh conservation financing initiative in several locations in New Zealand (scoping projects and confidentiality issues currently apply).

The biodiversity credit monetisation strategy in these projects has been twofold:

- a) Corporate Social Responsibility (CSR) buyers purchasing Habitat Hectare Units. Buyer motivation: desire to contribute to financing the conservation of the forest.
- b) Voluntary carbon market buyers purchasing Habitat Hectare Units in direct association with carbon credits. Buyer motivation: Desire for a localised (i.e., close to the buyer) nature-based solution to voluntary carbon offsetting. This includes stapling habitat hectare units to carbon credits.

4.7.2.3 Stapling Biodiversity Credits & Carbon Credits

The term 'stapling units' refers to combining (or stacking) different benefits/co-benefits together into a single (stapled) package. The purpose of stapling is to enable a project outcome (e.g., a biodiversity conservation outcome) to gain access to market-based financing when it cannot do so on its own.

Demand for nature-based solutions in the voluntary carbon offsets market is already well established and one of the key reasons why indigenous forest carbon credits are among the highest priced in the voluntary carbon market. Nature-based carbon credit prices are often higher than carbon credits without nature-based co-benefits because the additional co-benefits make the projects more costly to develop. Accordingly, higher carbon credit prices are required to enable such projects to break even financially and succeed commercially.

By stapling a biodiversity credit to a carbon credit, the stapled combination can be monetised in the voluntary carbon offsets market targeting buyers with a preference for nature-based carbon offsetting.

4.7.2.4 Market Access

Monetising biodiversity credits or stapled biodiversity and carbon credits will, like any commercial undertaking, require sales and marketing capability. In turn this will require assigning a sales and marketing role to appropriate entities in a commercial supply chain. Several intermediaries deliver ecosystem market services in many countries around the world. This includes CSR brokers and carbon and biodiversity market facilitators and resellers (and their networks).

Examples in Australia and New Zealand include:

- Australia: Green Collar (<https://greencollar.com.au/>), Tasman Environmental Markets (<https://www.tasmanenvironmental.com.au/>), Greenfleet (<https://www.greenfleet.com.au/>), Niche (<https://niche-eh.com/>).
- New Zealand: Ekos (<https://ekos.co.nz/>), Toitū Envirocare (<https://www.toitu.co.nz/home>), Carbon Click (<https://www.carbonclick.com/>).

Examples in Europe include:

- ZeroMission (<https://zeromission.se/en/>), MyClimate (<https://www.myclimate.org/>), South Pole (<https://www.southpole.com/>), Nature Based Ventures (<https://www.nb.ventures/>), Landlife (<https://landlifecompany.com/>), Forliance (<https://forliance.com/>).

Examples from North America include:

- Winrock International (<https://winrock.org/>), The Nature Conservancy (<https://www.nature.org/en-us/>), C-Quest Capital (<https://cquestcapital.com/>), ClimeCo (<https://climeco.com/>), Bluesource (<https://www.bluesource.com/>), TerraCarbon (<http://www.terracarbon.com/index.html>), Natural Capital Partners (<https://www.naturalcapitalpartners.com/>), Terra Global Capital (<https://www.terraglobalcapital.com/>).

4.7.3 Workability

Attribute	Description	Ranking		
		Low	Med	High
Potential	Ability to generate sustainable financing for IAS in these countries.			
Effort	Difficulty of implementation.			
	Availability for use.			
	Barriers to workability (e.g., admin costs, degree of regulatory support etc.).			
Capacity	Capacity of host country to implement.			
	Capacity of external partnerships to enable			

4.7.3.1 Potential

The potential for biodiversity credits to be used to finance IAS control, particularly when undertaken as stapled credits, is higher than the potential for carbon credit projects to support sustainable financing for IAS. This is

because stapled biodiversity credits have a path to sustainable financing through existing carbon markets coupled with the fact that the biodiversity enhancement activity is not limited to those with carbon benefits.

The scale of financing made possible by this approach is limited only by the level of demand for:

- Nature-based carbon credit solutions in the international voluntary carbon offsets market.
- Investor interest in projects that deliver a modest financial return on investment (see section 5 below on sustainable financing modalities).

4.7.3.2 Effort

The effort to deliver a biodiversity credit project is greater than an equivalent biodiversity enhancement project that is not being registered as a biodiversity credit project, due to additional measurement, reporting and verification requirements of international standards. But the effort required is likely to be less than what is required for a carbon project. This is because biodiversity credits that are not being used to offset biodiversity losses (i.e., they are not biodiversity offsets) have a lower measurement/monitoring burden than both biodiversity offsets and carbon offsets.

4.7.3.3 Capacity

As with carbon credit projects, the host country is likely to lack the capacity to deliver a biodiversity credit project alone. But with appropriate partnership arrangements with external actors a biodiversity credit project is likely to be easier than a carbon project. This is because the biodiversity enhancement activities (i.e., IAS control) can be the same activities that are already being undertaken in these countries, or that are planned by these countries.

As with carbon projects, there is capability and capacity in the international sphere for foreign partner entities to work with local counterparts to create biodiversity credit project opportunities.

4.7.3.4 Implementation

Implementation steps for biodiversity credit project development in the target countries:

1. Seek grant funding to undertake:
 - a. A project scoping study to evaluate potential for biodiversity credit project development using IAS as a key activity. Outcome: short list of possible pilot projects.
 - b. Up to three pilot project scoping studies. Outcome: Readiness to seek project development funding to undertake pilot projects.
2. Detailed scoping study for each pilot project. Outcome: Investment readiness for viable pilot projects. Able to register project with carbon standard.
3. Recruit project developer to assist in fundraising.
4. Determine a preferred sustainable financing modality (type of investment) to fund project development. Options for sustainable financing modalities presented in Section 5.
5. Design capital structure for investment vehicle.
6. Undertake fundraising.
7. Undertake project development (including biodiversity credit methodology development).
8. Validate Project Description (containing project business plan and management plan) and biodiversity credit methodology.
9. Implement & monitor project.
10. Verify periodic project monitoring reports.
11. Issue biodiversity credits.
12. Monetise biodiversity credits through a carbon and/or biodiversity credit reseller identified in the Project Description).
13. Disburse revenues according to benefit sharing plan and associated agreements (including debt-servicing).

4.8 REVENUE FROM SALES

4.8.1 Description

An innovative option for sustainable financing for IAS control, particularly in early stages of an eradication or control programme, is turn them into economically useful resources. Notably, generating revenue from the use of IAS fits is potentially compatible with ‘functional management’ IAS strategy for suitable target species. Functional management IAS strategies focus on limiting the abundance of IAS below levels that damage the ecosystem in priority locations where eradication is either not needed or is impossible or impracticable.

Numerous case studies have shown that a financial incentive for locals to engage in control activities can be an effective pathway to building sustainably financed ongoing functional management.

The risks associated with this approach include:

- Economic drivers that can create perverse incentives for participants to maintain pest population densities sufficient to “farm” the pest to maintain a revenue stream.
- Failure of the business model if/when the IAS feedstock drops to low levels leaving the initiative to go out of business.
- Boom and bust cycles of project operation in tandem with high pest populations followed by low populations after heavy control, but then followed by a period where managers allow the pest population to rise to high levels again to increase the return on effort for subsequent pest harvesting.

These risks can be mitigated by:

- Carefully selecting project types for this style of revenue generation and avoiding projects where these risks are high.
- Planning the transition from the IAS feedstock to a safe purpose grown one, and/or alternating between IAS and non-IAS feedstock.

4.8.2 Examples

Some of the following provides examples may be relevant in a Pacific Island context:

Example	Explanation
Processing Sargassum seaweed into alginate and biostimulants in the Caribbean.	<p>Sargassum seaweed is invasive to marine ecosystems in the Caribbean. In the water, it accumulates, causing hypoxia or anoxia which kills coral reefs and animal populations. Once on shore, the rotting Sargassum releases green-house and toxic gasses, including methane, hydrogen sulphide gas and ammonia. To control the spread of Sargassum, the Caribbean is exploring the option of commercialising it to incentivise locals (via payments from the sale of Sargassum end-use products) to harvest Sargassum at scale. Sargassum has two principle commercial uses:</p> <ul style="list-style-type: none">• Biostimulants (an organic fertilizer), as it is rich in all essential components necessary for plant growth• Alginate, a polysaccharide used in foods, textiles and pharmaceuticals, with a market size of USD 728 million in 2020 (projected to reach USD 1 billion by 2028). <p>While high processing costs have limited alginate extraction from Sargassum in the past for small island developing countries, new technologies have significantly lowered costs, energy use, and water use in processing techniques.</p>
Processing invasive weeds into biogas in Kenya	<p>IAS that contain a high ratio of carbon to nitrogen are ideal for conversion into biogas. Water hyacinth on the shores of Lake Victoria, Kenya, has been gathered by local people as a feedstock for bio-gas digesters for biogas production for cooking fuel.</p>
Manufacturing bio-concrete from invasive species	<p>Researchers in the UK have created concrete-like tiles from processing two invasive species, Japanese knotweed and American signal crayfish. Normally these species, once harvested for IAS control purposes, are buried in landfills or incinerated. The researchers wanted to</p>

turn invasive species into a valuable product. The process works by using the knotweed as an ash binder, and pulverised crayfish shells as the aggregate instead of the traditional rocks or sand.

Notably, one difficulty this initiative faces to full commercialisation is that IAS in the UK are categorised legally as hazardous waste once they are removed, making it difficult to repurpose them as raw materials. There would need to be regulatory change to enable harvested IAS to be integrated into a production process at scale.

Supporting tourists to contribute to IAS projects

Tourism can be used to support the regeneration of ecosystems that often operate in conjunction with IAS control programmes. In Bonaire, for example, local dive operators train tourists to help maintain coral nurseries and outplant coral fragments onto degraded reef sites. To date, more than 22,000 corals have been out-planted onto Bonaire’s reefs.

4.8.3 Workability

Attribute	Description	Ranking		
		Low	Med	High
Potential	Ability to generate sustainable financing for IAS in these countries.			
Effort	Difficulty of implementation.			
	Availability for use.			
	Barriers to workability (e.g., admin costs, degree of regulatory support etc.).			
Capacity	Capacity of host country to implement.			
	Capacity of external partnerships to enable.			

4.8.3.1 Potential

There is a variety of invasive species in the Pacific Islands with commercial potential. These include:

- Fireweed for food and bioethanol production: Fireweed is a good source of Vitamin C and A. All parts of the fireweed are edible. The young leaves can be eaten raw in salads or sautéed in a stir fry or with other greens. Alternatively, fireweed can be used to make bioethanol for fuel purposes.
- Sargassum seaweed: This is increasingly a problem in many Pacific Island countries as ocean temperatures rise. Tuvalu, for example, has noticed increased amounts of Sargassum invading coastal waters. There may be an opportunity to harvest and process Sargassum into alginate and/or bio-stimulants, for growing markets internationally, but the feasibility of engaging with these markets would need to be determined.
- Harvesting and processing invasive tree species, vines and grasses into biofuels and other useful materials. *Merremia peltata*, for example, can be used as a feedstock for biogas production, or cattle feed.

4.8.3.2 Effort

The effort involved in establishing and maintaining revenue from sales model for IAS control is dependent on the particular project attributes. Some project types will be relatively easy with little additional effort, whereas others may be very complex and difficult to operate with high risks of failure.

4.8.3.3 Capacity

There is likely to be relatively low capacity in the host country to develop and operate revenue from sales project alone, but with outside support such an approach may be plausible and feasible.

4.8.3.4 Implementation

First develop an IAS management strategy for functional management and or transitioning through time from functional management to elimination. The next step is to design a sustainable business model that will use the IAS feedstock but also in such a manner that it does not create a perverse incentive to keep IAS populations higher than a certain functional management threshold.

4.9 ENVIRONMENTAL TRUST FUNDS

While not a revenue stream as such, Environmental Trust Funds are also not a sustainable financing mechanism, but instead are a governance structure that can be used as part of a sustainable financing strategy in a cross-cutting manner.

An Environmental Trust Fund (ETF) is an independent legal entity and financial structure to help mobilise, blend, and oversee the collection and allocation of capital for environmental purposes. They facilitate strategic focus, rigorous project management, monitoring and evaluation, and high levels of transparency and accountability. ETFs are typically capitalized from multiple sources. More commonly, they are sourced from a mixture of government funds and private grant funding from multilateral institutions and including debt-for-nature swaps.

ETFs manage the collection and distribution of revenue streams (e.g., payments for IAS control). They can also engage in external investment with an expectation of a return.

4.9.1 Type of ETFs

- **Strategy funds** are environmental funds with a mandate to support a full range of activities included in national environmental plans or strategies, for example, the National Environment Fund (FONAMA) in Bolivia. For the purpose of IAS control, an IAS strategy fund could encompass one, or multiple, of the following financing purposes, for example: biosecurity control (including use of revenue from IAS-related border activities), community-based IAS control projects; the creation of more innovative revenue streams for IAS control (E.g., commercialisation of IAS).
- **Park funds** support the conservation of protected areas; either specific parks or national protected areas systems are called park funds. Examples of these are the Fund for Natural Areas Protected by the State (PROFONANPE) in Peru and the Jamaica National Parks Trust.
- **Grant funds** make grants to others, typically NGOs and community groups for conservation and sustainable development projects. Grant funds often have objectives that include strengthening civil society organizations, increasing environmental awareness or expanding understanding of environmental issues. An example of a grant fund is the Fund for the Americas in Chile.

4.9.2 Fund Management Strategies

ETFs are managed to provide sustainable on-going payments for the long-term, or at least for the expected length of a project. One of three (or a mixture) of the following strategies can be employed:

- **Endowments** are established with a set amount of capital (e.g., grants from multilateral funds). To maintain or grow their capital, endowment-based funds invest in equities, bonds and other types of low-risk investments. Income from these investments is used to make payments (e.g., to an IAS control programme). ETFs can also to invest capital into impact investments, for example, into community-based social enterprises, to maximise impact within an ETF's geographical mandate.
- **Sinking fund** management strategies are employed to finance projects that have a foreseeable end date. The eradication of an IAS could fall into this category. Sinking funds, as with endowments, typically receive a set amount of finance from the outset and are designed to disburse their entire investment income over a fixed period of time (typically at least 5-years).

- **Revolving funds** receive new resources on a regular basis (e.g., proceeds of special taxes, fees or levies designated to pay for IAS control), which replenish or augment the original capital of the fund and provide a continuing source of money for specific activities. Revolving funds, like endowments, can generate capital from investments, including impact investments.

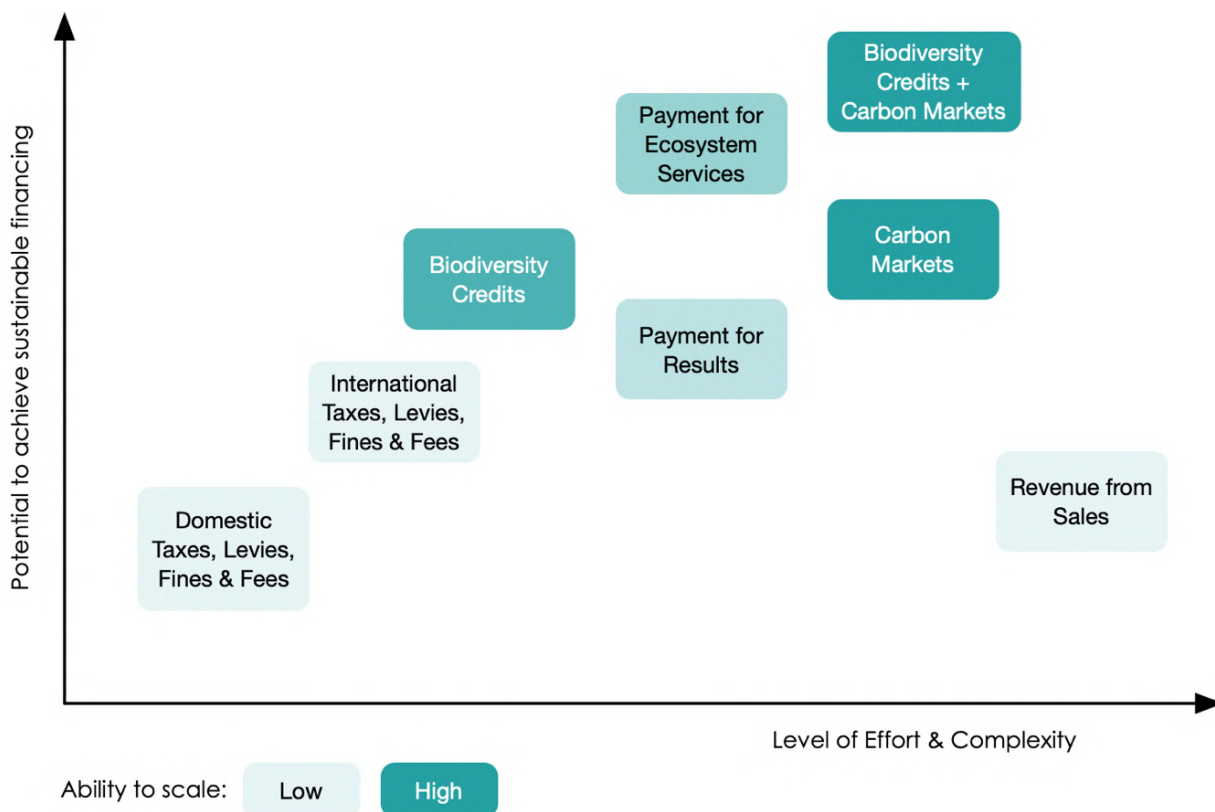
4.10 ANALYSIS OF OPTIONS

Delivering the highest benefit for least effort/cost/risk benefits from strategically evaluating different sustainable revenue stream options by considering the following metrics:

- Difficulty.
- Ability to scale.
- Potential benefits.

Figure 4.10 maps different revenue stream options on a scale of potential benefits and effort/difficulty. Notably, this figure shows that the easiest options to generate a sustainable revenue stream have lower potential to achieve sustainable financing. The mid-range options are those with the highest results for least effort.

Figure 4.10. Options for sustainable revenue streams to support IAS control in the Pacific Islands Region.



5 Sustainable Financing Modalities

Whereas **sustainable revenue streams** deliver cash flows to fund IAS project operational expenditures, **sustainable financing modalities** encompass the investment to cover capital expenditure costs that enable sustainable revenue streams to be ready to deliver their sustainable cash flows. This capital expenditure cost includes the setup of enabling project/programme infrastructure, planning, project/programme development required at the start-up phase.

Investment is needed in many sustainably financed project/activity types because the early-stage revenue generation in a self-financing project/activity is often insufficient to cover both the start-up costs and the operational expenditures during early years.

The start-up investment can come from a grant or a loan. If start-up grants are not available, or the initiative seeks to be fully self-financing so that it is not limited by the availability of start-up grants, then capital investment will be required from some form of debt or equity financing.

Debt financing involves a secured or unsecured loan to be paid back (usually with interest) in the future. When a lender wants to reduce their risk of never getting their money back, they will secure the loan against an asset of the borrower entity without taking any ownership of the borrower entity itself. A common example is a home mortgage where the loan is secured against the house but where the lender does not take ownership of any portion of the house.

Equity financing involves the lender securing the loan through taking ownership of portion/percentage (i.e., shares) of the borrower entity – where the borrower entity is usually a limited liability company (i.e., not a charity or trust because the latter cannot offer shares).

Most sustainable financing modalities have some element of output or results-based performance requirement. This means that activities and programmes seeking support from sustainable financing modalities must measure, report and verify the social and/or environmental performance of underlying investments, ensuring transparency and accountability.

Sustainable financing modalities can be divided into three broad and overlapping categories: impact investment, blended finance, and philanthropic and public development finance (see Figure 5 below).

Figure 5. Categories of sustainable financing modality.

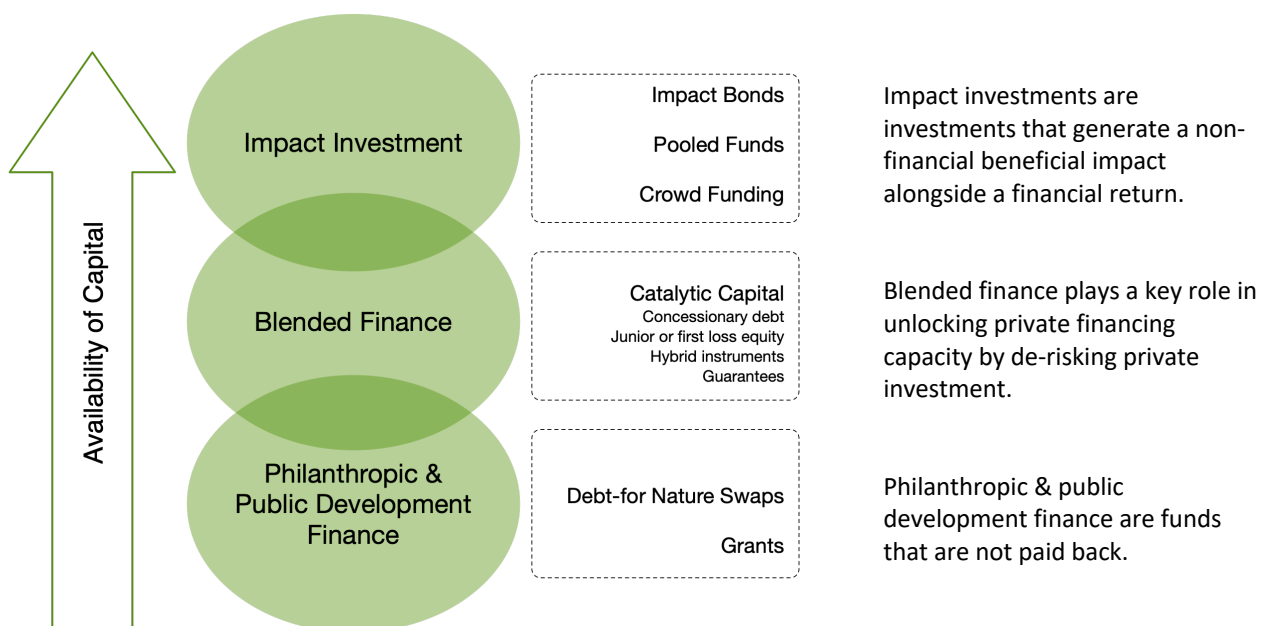


Figure 5 shows that the availability of capital increases upwards. The **philanthropic and public sectors**, both sources of traditional grant financing, have the least potential in terms of available volumes of investment capital. This is especially true in the context of ecosystem protection and regeneration, including IAS control. Globally, and in particular in the Pacific Islands, diminishing public funds has seen a growing gap in the finance available versus required to preserve healthy terrestrial and marine ecosystems (estimated at approximately USD 300 billion to USD 400 billion every year) (GEF, 2021). Blended finance and impact investment will need to play a key role in closing this gap. Of such, it is increasingly recognised that that an increasing number of private sector financial actors, collectively holding USD 300 trillion in assets, will need to be converted into **impact investors** (Illes, et al. 2017; Tideline 2019; RPA 2017).

5.1 IMPACT INVESTMENT

Impact investment has emerged against the backdrop of inflating complex and global problems, ranging from climate change through to unprecedented inequality. Private sector investors acknowledge that they have played a pivotal role in the creation and perpetuation of these problems; climate change, for example, has been enabled by on-going capital flows into fossil fuel industries, despite knowing about the ‘greenhouse effect’ for decades.

Impact investment represents an internal effort from the financial sector to reform and is characterised by a growing desire amongst a subset of private sector investors to generate positive social and environmental impact with their investment (vs. negative impacts).

The practice of impact investment has three key characteristics:

- *Intentionality*: An investors intention to have a positive impact though their investment.
- *Return*: Investors expect to generate a financial return on capital or, at a minimum, a return on capital.
- *Impact measurement*: A strong commitment by the investee to work with the investor on measuring and reporting on the social and/or environmental performance and the progress of underlying investments, ensuing transparency and accountability.

Impact investors fall into two broad categories:

1. *Finance first investors* are not willing to make any financial sacrifice to achieve their social goals.
2. *Impact first investors* are willing to make some financial sacrifice by taking greater risks or accepting lower returns to achieve their impact goals.

The latter is especially important to the majority of initiatives focused on enhancing biodiversity and ecosystems, especially those grounded in community-based management. Finance first impact investors, however, can invest in these types of projects with the help of blended finance, as this enables one investor to pursue market rate returns, while the other can provide sub-market rate (or no) returns.

In an ideal world, most impact investors would be in the *impact first* category. Most impact investors, however, are *finance first* impact investors. As such, blended finance is increasingly recognised as key to unlocking impact investment flows at the scale needed in environmental financing. In turn, this means that traditional sources of finance, such as governments and development banks that can provide guarantees and other types of blended finance, will need to play a central role in sustainable financing modalities.

The following subsections provides an overview of different types of sustainable financing modalities that have potential to provide additional external capital for IAS control in the Pacific Islands.

While in an ideal world, the majority of impact investors would be impact-first, this is not the case: most are not willing to sacrifice a financial return, and at best will become finance-first impact investors (see Figure 5). There is, however, a growing number of impact-first impact investors but they are a minority in the impact investment world.

5.2 BLENDED FINANCE

Blended finance is a useful tool to enable investors to transition into impact investment. Sustainable financing modalities in this category accept a disproportionate risk and/or concessionary return to ‘catalyse’ third-party investment that otherwise would not be possible. Of such, blended finance is often referred to as ‘catalytic capital.’ While typically, blended finance providers are from the philanthropic or public sector, impact-first impact investors can also provide blended finance solutions (e.g., first loss or junior equity that carries higher risk than other equity partners) (Ibid.).

Traditional sources of finance such as governments and development banks, that can provide grants and guarantees, will need to play an important role in sustainable financing modalities – particularly in blended finance and catalytic capital. Even though these funders have only a fraction of the funds necessary to address global biodiversity challenges, they can play a pivotal role in unlocking large volumes of private sector funds as catalytic capital providers. Indeed, the role of catalytic capital provider can be seen as an efficient way of amplifying the beneficial impact of public spending.

5.3 IMPACT BONDS

A bond is a debt financing instrument involving a loan made by an investor to a borrower. The borrower issues the bond and is required to pay an interest rate and the principal during a fixed timeframe. The return for the bond purchaser (the investor) is the interest on the bond.

Impact bonds (IBs) place impact-focused bond instruments. This contrasts with more traditional bonds (including mainstream green bonds) that favour investor interests and tend to compromise impact for market rate returns. An IB is a results-based contract between three parties:

1. External impact investor (bond purchaser).
2. Outcome funder (bond issuer).
3. Service provider (outcome deliverer).

An outcomes funder can be a government, a donor or foundation. Because IBs are not a commercial model that conforms to conventional expectations of risks and returns, investors should preferably be *impact first* impact investors.

Key characteristics of IBs include:

- Outcomes are identified in close collaboration with target beneficiary communities.
- Outcomes are typically broad and longer term, to enable experimentation, learning, and improvement of service delivery.
- Prefer *impact first* impact investors delivering longer-term (at least 5 years) and concessionary investment.
- May seek catalytic capital (see below) from one or multiple sources to de-risk investment. For example, IBs often involve a guarantee by a government body.
- IBs are structured to be self-sustaining with very limited risk of the guarantee being drawn upon and an option for security to be liquidated for bond repayment if necessary. IBs are ideally used for environmental and/or social initiatives that have multiple revenue streams such as commodity sales revenues (e.g., locally grown produce) coupled with market-based payments for environmental outcomes (e.g., carbon credits and/or biodiversity credits).

Varieties of Impact bonds relevant to IAS:

- **Community Bonds:** Community bonds operate at the project level structure for raising low-cost capital for investment-grade issuers like local councils to deliver holistic outcomes that directly benefit local communities (e.g., climate adaptation, community resilience, livelihood opportunities and biodiversity outcomes).

- **Blue bonds:** A relatively new type of IB that mobilises finance for projects related to ocean conservation.⁷
- **SDG bonds:** Used to fund projects with multiple SDG-related outcomes.
- **Sustainable land bonds:** With interest rates at historically low levels, there is an opportunity for banks to issue long-term money at low cost (i.e., yield between the cost of capital and returns from nature have never been higher). Maturities would typically be 10–30 years reflecting the timescale that sustainable land use change takes to fully realise. This type of bond would involve a bank entering into results-based finance agreement with a government agency. Finance would be used to pay landowners/communities for regeneration of natural ecosystems.
- **Development Impact Bonds:** The key differentiator of these bonds is that the buyer is a donor (who could be a philanthropic foundation, a multilateral donor or bilateral donor), rather than the government in which the intervention is operating. Development impact bonds can also be focused on delivering social, green, blue or broader SGD outcomes.

5.4 POOLED FUNDS

Pooled funds are a managed investment vehicle that pool capital from multiple sources to invest in multiple projects to diversify risk. In the context of biodiversity and conservation, pooled funds typically have an identified purpose and investments. Hypothetically, for example, a pooled fund could invest in a number of community-based PES schemes for IAS control.

A blended financing model can be useful to capitalise pooled funds. For example, a pooled fund could allow for investment at three different levels: a first loss tranche (e.g., a guarantee from a multilateral development bank); concessionary debt from an impact-first investor (e.g., a government); and debt (capped at appropriate levels) from a private impact investor. Pooled funds are only appropriate for IAS control activities capable of generate robust or multiple revenue streams. For example, a PES scheme, generating dual revenue from carbon credits and revenue from sales (e.g., commercialised IAS or agroforestry produce), could be a good fit.

⁷ Best practice guidance on structuring can be found at: [Blue Natural Capital + Impacts Framework](#) (BNC+ Framework), developed by Blue Natural Capital Financing Facility and grounded in the IUCN's BNC Positive Impacts Framework (covers conservation management, ecosystem restoration, climate mitigation, creation of jobs and livelihoods, and gender equality).

The Althelia Climate Fund – a pioneer pooled fund of natural capital investment

The Althelia Climate Fund (ACF) is managed and advised by Mirova Natural Capital (based in Europe). It was launched in 2013 as an 8-year closed € 101 million impact investment vehicle, designed to finance scalable forest conservation projects globally. Investors in the fund include The European Investment Bank (€ 15 million), FinnFund, the Dutch development bank FMO, AXA Investment Managers, Credit Suisse Group and the Church of Sweden).

The ACF's initial focus was on investments in high carbon and biodiversity rich forests threatened by pressures from growing populations, resource extraction and mono-crops. The Fund targeted competitive returns by ensuring its investments were capable of generating multiple revenue streams. For example, sales of certified commodities, such as sustainable timber, deforestation-free cocoa and coffee; carbon credits (generated from protecting and regenerating forests); ecotourism; and PES (from providing clean water, and pollinating crops) (IDB, 2021) The ACF has attracted investments for more than 10 projects in Peru, Guatemala, Brazil, Kenya, Rwanda, and Indonesia, creating or supporting 77 sustainable enterprises. Over a decade, its conservation outcomes include:

- 101,300 hectares of deforestation avoided.
- 41 million tons of CO₂ emissions avoided.
- 250,000 hectares under improved conservation management.
- 228,000 hectares of indirect conservation.
- 1,975,000 hectares of critical habitat protected.
- 115 threatened species populations protected.

5.5 PARTNERSHIPS FOR A PUBLIC PURPOSE

Partnerships for public purpose (new definition of PPPs) are increasingly recognised as a core to the effective delivery of sustainable financing modalities that involve a contract between the public and private sector actors such as bonds and multi-party funds.

New PPPs mirror the structure of a traditional Public Private Partnership (PPP): a long-term contract between the public sector client and a private entity (or consortium) to deliver specified outcomes. Traditional PPPs sought out private sector *profit-first* enterprises. The key difference with new PPPs is that they seek out private sector players that have historically been excluded from PPPs; non-profit, social-enterprise, and community-based stakeholders. New PPPs acknowledged that these actors are key to the effective delivery of impact because they are more connected to local realities (including problems and solutions). Additionally, they have potential to generate multiple co-benefits to environmental outcomes, such as local business opportunities and employment.

New PPPs focus on building true partnerships with a diversity of private sector stakeholders to get the balance right between community-led solutions and external financial support.

5.6 CROWDFUNDING

Crowdfunding is a financing method that involves funding a project with relatively modest individual contributions from a large group of individuals, rather than seeking substantial sums from a small number of investors. While crowdfunding emerged in the context of funding for social and community-based enterprises, crowdfunding for biodiversity conservation is a rapidly growing phenomenon. There are four types of crowdfunding:

- Rewards-based crowdfunding is where backers give a small amount of money in exchange for a reward (e.g., fresh produce).
- Donation-based crowdfunding is where donors donate a small amount of money.
- Equity crowdfunding is generally used to raise money to fund the launch or expansion of an enterprise. In equity crowdfunding, investors give larger amounts of money (at least USD 1,000) in exchange for a small piece of equity in the business.
- Debt crowdfunding is where lenders grant a loan with the expectation that they will recoup the principal plus interest.

Donations and debt-based crowdfunding are the most common (see *Dundreggan Rewilding Centre* case study below).

Crowdfunding initiatives can be organised via public bodies such as the Biodiversity Finance Initiative of the UNDP in partnership with the Alternative Finance Lab, which used crowdfunding campaigns for biodiversity conservation in several countries. Alternatively, there are many privately owned on-line platforms for crowdfunding such as StartSomeGood (<https://startsomegood.com/>) and Kickstarter (<https://www.kickstarter.com/>). Notably, Crowdfunding is not new to the Pacific. It is used widely in the context of raising funds for entrepreneurs and NFP projects⁸.

Dundreggan Rewilding Centre

Triodos Bank, Europe's leading sustainable bank, has partnered with the charity Trees for Life, to offer every-day investors the opportunity to invest directly in a rewilding charity for the first time. Investors can take advantage of a bond offer on the Triodos Crowdfunding platform from as little as £50.

Funds raised will be used to regenerate Dundreggan, with the co-benefits of creating green jobs and volunteering opportunities, and reconnecting people with nature. The project can repay investors through multiple possible revenue streams, including sales of carbon credits, sustainable forestry (silviculture), and revenue from visitors to the park (70,000 visitors estimated annually by 2030).

⁸ <https://www.pacific.undp.org/content/pacific/en/home/presscenter/articles/2020/can-we-crowdfund-for-social-impact-in-the-pacific.html>

5.7 CATALYTIC CAPITAL

Catalytic capital is a class of impact investment that accepts higher risk, lower returns, and longer timeframes and is designed to enable other investors with lower risk and higher return appetites to participate (blended finance).

Examples:

- **Concessionary debt:** Debt instruments (i.e., loans) can be made ‘concessional’ by offering below-market interest rates, flexible repayment timelines or generous grace periods, relaxed collateral requirements, and/or less rigid underwriting guidelines (relative to traditional lenders).
- **Equity instruments:** Equity can take on a catalytic role when the investor accepts lower capital returns; takes the most junior equity position in the overall capital structure to absorb losses before other investments; and/or has a longer or undefined exit timing compared to traditional equity investments.
- **Hybrid instruments:** These are either debt instruments with equity characteristics or equity instruments with debt characteristics. Examples include convertible loans, royalty-based lending, redeemable equity, and preferred shares.
- **Guarantees and risk insurance:** These are common instruments used by catalytic capital investors to provide assurance of principal repayment to other investors in the case of default. This is a capital-efficient way for catalytic capital investors to enable investment by others, as capital is only drawn upon from the guarantor if a default event occurs.

The above types of catalytic capital can be used in several ways. Typically, they are injected directly into a project or enterprise. They can also be used in funds, and other pooled investment vehicles (such as bonds). In both cases, the aim is to attract additional private investment – hence catalyse other investments.

5.8 DEBT-FOR-NATURE SWAPS

5.8.1 Description

Debt-for-nature swaps (DNS) are an agreement that reduces a developing country’s debt in exchange for a commitment to protect nature from the debtor-government. DNS can be used as either a sustainable revenue stream (e.g., used to buy outcomes) or a sustainable financing modality (provide start-up capital investment). As such, we have placed it here in this sustainable financing modality section.

DNS comprise voluntary transactions whereby the donor cancels the debt owned by a developing country’s government conditional on the delivery of the nature-based solution outcomes contracted. In this way, the cash that would have been used to service debt are instead channelled into conservation projects.

DNS are a familiar sustainable financing modality in international development. As above, historically DNS have played an important role in capitalising Environmental Trust Funds.

DNS have been recognised as a necessary opportunity following the Covid-19 pandemic, which has pushed many developing countries into unsustainable levels of debt. Potential benefits of DNS include:

- Channelling Pacific Island country government cash into domestic spending instead of sending that money offshore.
- Boosting post-Covid-19 economy recovery of the Pacific Island country through IAS initiatives that include private investment and involve community enterprise elements.

- Reduced external sovereign debt: DNS can help highly indebted nations reduce debt service burdens and free up cash flows for more productive investments.

5.8.2 Examples

For example, a DNS arranged in 2007 between the United States of America and Costa Rica involved cancelling USD 26 million of Costa Rica’s external debt with the US by 2024. The money that would have otherwise serviced this debt has instead funded the conservation of almost 800,000 hectares of tropical forest protection, the planting of about 60,000 trees, the development of climate adaptation plans, and purchasing of new land for habitat restoration.

5.9 GRANTS

Grants alone are not considered sustainable financing modalities; they cannot not enable a project or activity to become financially self-sustaining and can create relationships of dependency. When ‘blended,’ however, grants do become sustainable financing modalities because, in a similar fashion to catalytic capital, they can play a very important role in leveraging capital from more conventional investors and/or helping impact-orientated projects to access capital on more favourable terms. For example:

- The Global Environment Fund is the largest multinational fund for biodiversity-related projects. It gives grants (sometimes well above USD 2 million) for bio-diversity related projects. GEF grant funding is commonly channelled into ETFs that are supplemented with revenue from taxes and levies.
- Smaller grants can play a role as catalytic capital in enabling sustainable financing. Example, a carbon project with a significant IAS component has an impact investor who needs a 6% interest rate on money they loaned to the project to fund project establishment. Without a grant, the project can only deliver a 1% interest rate on borrowed money. The grant amount can then be calculated as the amount of non-commercial money required to move the project financial performance from 1% to 6% in a blended finance project where the vast majority of funding is provided commercially in the form of impact investment for capital expenditure and carbon credit sales revenues for operating expenditure and debt repayment.

This strategic use of grants within a sustainable financing strategy can be contrasted to the current use of grants for IAS in the Pacific which lack a sustainable financing component. Moreover, the use of grants in blended finance IAS business models has the potential to significantly amplify the beneficial impact of the grant which functions as catalytic capital to leverage much larger sums of private money to do the financial heavy lifting in IAS initiatives.

The perpetual reliance on grants, coupled with a confluence of complex development challenges helps to explain why the Pacific is the most aid dependent region in the world. Conversely, using grants as a key element of a sustainable financing strategy can help break this dependency, and enable far greater resilience and self-determination.

* * *

See Appendix 1 for more detail on relevant sources of external investment currently or potentially available for application as sustainable financing modalities.

6 Sustainable Business Models

Sustainable business models are plans for specific types of project or initiative that combine sustainable revenue streams with sustainable financing modalities to deliver an IAS outcome. Presenting examples of all possible business models is beyond the scope of this report. Instead, three examples are provided to illustrate what a sustainable financing model might look like in practice.

Each business model has some common elements relating to managing risk. These include capability transfer from external partners to local counterparts, transitioning from one revenue stream to another, using catalytic capital and/or blended finance.

6.1 INDIVIDUAL PROJECTS VS SCALING UP

Any innovation with potential for sustainable financing ideally needs to be tested and proven at an early stage to help in the design of an operation at a larger scale. This testing and design refinement can be delivered through pilot projects and demonstration activities.

Such pilot projects and demonstration activities would ideally focus on the following project attributes:

- Technical delivery.
- Financial viability.
- Socio-cultural durability.

The Pacific Islands environmental project space has many individual or pilot projects that do not proceed to scale. Indeed, scaling up pilot projects can be very difficult, particularly because scaling up is not the same as replication. Scaling up an activity beyond a pilot project requires the establishment of enabling infrastructure and administrative systems that can cope with multiple activities occurring simultaneously, multiple actors operating concurrently, and sometimes several revenue streams intersecting. This requires a transition from a collection of projects to a programme of activities that have sufficient planning, financial, capability, capacity, and administration resources to cope with the proposed scale of operation.

6.2 EXEMPLAR 1: BIODIVERSITY CREDITS, TONGA

Proposed site: Mount Talau National Park

Proposed IAS Control Outcomes: Biodiversity enhancement of the Mt Talau National Park.

Proposed Activities:

- Weed eradication.
- Rat control.
- IAS monitoring.
- Biodiversity monitoring.

Figure 6.2a Project Location

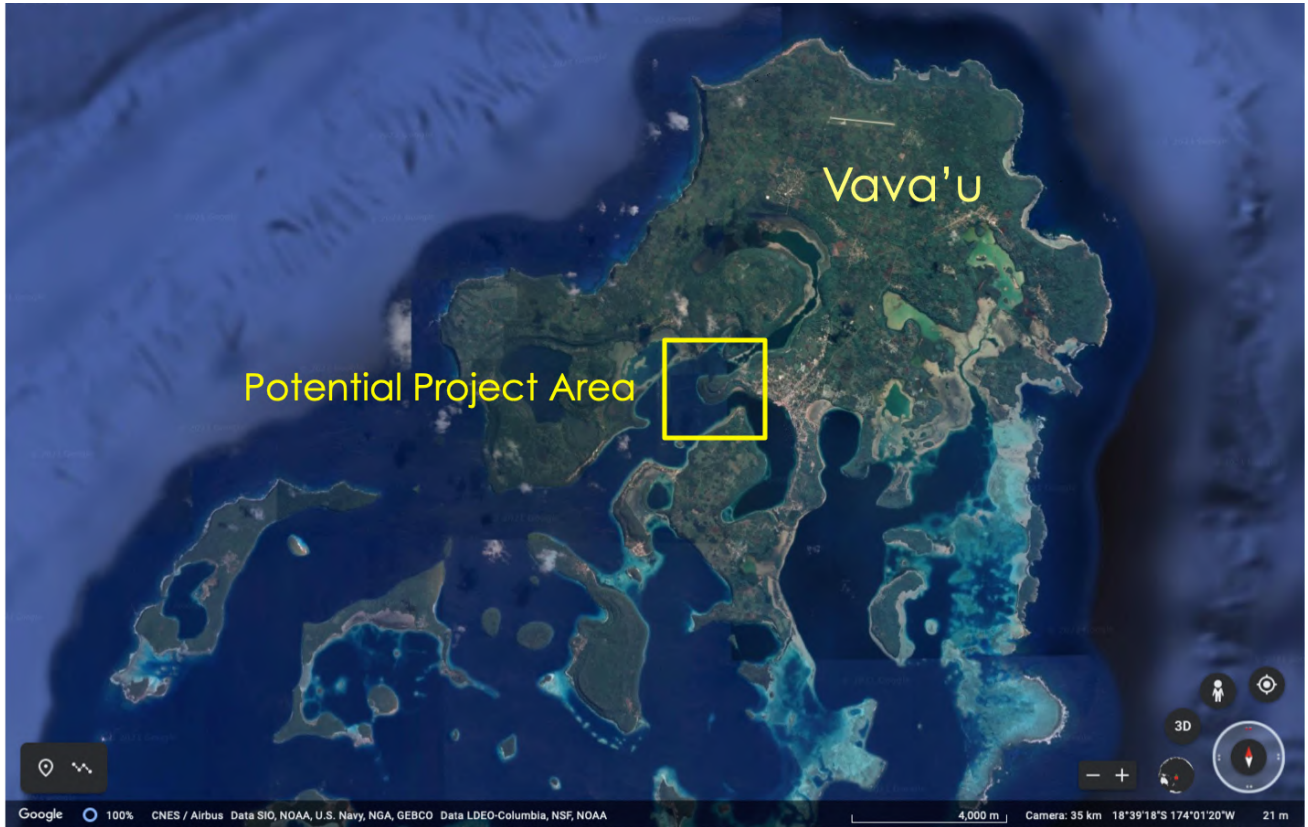


Figure 6.2b Project Site



6.2.1 Sustainable Financing Strategy

This sustainable financing strategy for IAS control at Mt Talau National Park uses placeholder project costs and is designed only as an illustration of how this approach to financing IAS could potentially be structured. The modelled sustainable financing strategy for this project involves the following:

6.2.1.1 Sustainable Revenue Stream

- Tradable Units: Biodiversity credits in the form of Habitat Hectare units (HHU).
- Annual Unit Volume: 500 (i.e., 50 ha project producing 50 HHUs p.a., and dividing each by 10 to create a tenth of a hectare unit size: 500 units p.a.).
- Certification: Plan Vivo Standard and issued as Plan Vivo certificates.
- Project period: 50 years.
- Monetisation strategy: HHUs (10^{ths}) stapled to carbon credits and monetised in the international voluntary carbon market.
- Carbon credit provenance: Energy sector carbon credits certified to the Verified Carbon Standard issued as Verified Carbon Units (VCUs).
- HHU 10th unit price: USD 34.00; Carbon credit unit price: USD 5.00. Stapled unit price: USD 39.00.

6.2.1.2 Sustainable Financing Modality

- Investment vehicle: Limited partnership special purpose company co-owned by project owner, programme operator, and lender.
- Finance: USD 50,000 loan secured against project cash flows.
- Interest rate: 7.5%.
- Loan maturity: 25 years.
- Lender: Propose a concessionary lender such as a donor.

6.2.2 Project Budget

Project establishment budget (y0-9) (using data provided by Vava'u Environmental Protection Association (VEPA) and supplied in Appendix 2):

Year	0	1	2	3	4	5	6	7	8	9
Date	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Project Development										
Project Description preparation	\$20,000	-	-	-	-	-	-	-	-	-
Project MRV methodology	\$5,000	-	-	-	-	-	-	-	-	-
Project validation	\$5,000	-	-	-	-	-	-	-	-	-
Equipment	\$663	\$663	\$663	\$663	\$663	\$663	\$663	\$663	\$663	\$663
Nursery	-	-	-	\$1,061	\$1,061	\$1,061	-	-	-	-
Training	\$1,326	\$1,326	\$1,326	-	-	-	-	-	-	-
Local management	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	-	-	-	-
Programme operator	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210
Contingency	\$2,000	\$2,000	-	-	-	-	-	-	-	-
TOTAL CAPEX	\$38,408	\$8,408	\$6,408	\$6,143	\$6,143	\$6,143	\$2,872	\$2,872	\$2,872	\$2,872

Project operational budget (y1-49) (showing only years 0-9) (using data provided by VEPA):

Year	0	1	2	3	4	5	6	7	8	9
Date	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Project Operations										
Trapping	-	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210
Weeding	-	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210
Monitoring	-	\$4,419	\$4,419	\$4,419	\$4,419	\$4,419	\$4,419	\$4,419	\$4,419	\$4,419
Local Management	-	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210
Programme operator	-	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210	\$2,210
TOTAL OPEX	-	\$13,258	\$13,258	\$13,258	\$13,258	\$13,258	\$13,258	\$13,258	\$13,258	\$13,258

6.2.3 Project Financial Performance

Client Information

Client:	SPREP	Area (ha):	50.0
Site:	Mt Talau National Park	Cashflow period (yrs):	50
Country:	Tonga	Activity:	IAS control & biodiversity

Assumptions

Project start	2022	Discount Rate	6.00%
Habitat Hectare Price	\$340.00	Loan amount	\$50,000
Project development costs	\$20,000	Loan interest rate	7.50%
Total HH Units produced	2,100	Loan maturity (yrs)	25
Average annual HH units	42	Grant funding	\$0

Project Performance

Capex	Capex/ha	IRR	NPV	Loan	Total Interest	Total Repayment
\$83,141	\$1,663	59.2%	\$47,498	\$50,000	\$170,646	\$220,646

Project Pricing

		HH Unit price	CC Unit Price	Stapled Unit Price	NZU Spot Price
		USD	USD	USD	USD
HH Units	50	\$340.00			
HH 10ths	5	\$34.00	\$5.00	\$39.00	\$45.00

The HHU 10^{ths} priced at USD 34 and stapled to energy sector VCU carbon credits priced at USD 5.00. Note that this kind of VCU can be acquired at a lower cost so this pricing is conservative and leaves room to raise the HHU unit price if necessary.

The stapled combination of units is priced at USD 39. For comparison and conceptually testing the likely willingness to pay by carbon buyers the stapled unit price of USD 39 has been compared with the NZU spot price in the New Zealand Emissions Trading Scheme which sets a benchmark for voluntary carbon credit pricing in the New Zealand voluntary carbon offsets market. At the time of writing the NZU spot price was NZD 64.50 which converts to USD 45.00. Voluntary carbon buyers in the New Zealand offsets market have proven to pay a premium above the NZU spot price (e.g., NZD 10 higher than the NZU spot price). This indicates a plausible market in New Zealand for these units.

Note also that the HHU unit price is not modelled to rise in real terms across the cash flow period which means that there is also room for raising the HHU price, if necessary, to fund additional activities not covered in the initial budget.

The financial success test for the loan investment: no negative cumulative cash flows across the 50-year project period (i.e., the project bank balance never goes below zero). Key financial metrics including the HHU unit price, the interest rate, the loan amount, and the amount of annual debt servicing were adjusted up and down until the financial model succeeded.

6.3 EXEMPLAR 2: BIODIVERSITY CREDITS, TUVALU

Proposed site: Motutala Islet, Tuvalu

Proposed IAS Control Outcomes: Eradication of Yellow Crazy Ants and enhancement of coastal biodiversity.

Proposed Activities:

- Ant eradication
- Biodiversity monitoring.

Figure 6.3a Project Location



Figure 6.3b Project Site



6.3.1 Sustainable Financing Strategy

This sustainable financing strategy for eradication of Crazy Ants on Motutala Islet uses placeholder project costs and a placeholder design merely as an illustration of how this approach to financing IAS could potentially be structured. Actual design and costings would require detailed project scoping and planning which was beyond the scope of this report. The modelled sustainable financing strategy for this project involves the following:

6.3.1.1 Sustainable Revenue Stream

- Tradable Units: Biodiversity credits in the form of Habitat Hectare units (HHU).
- Annual Unit Volume: 700 (i.e., 7 ha project producing 7 HHUs p.a., and dividing each by 100 to create a hundredth of a hectare unit size: 700 units p.a.).
- Certification: Plan Vivo Standard and issued as Plan Vivo certificates.
- Project period: 10 years.
- Monetisation strategy: HHUs (100^{ths}) stapled to carbon credits and monetised in the international voluntary carbon market.
- Carbon credit provenance: Energy sector carbon credits certified to the Verified Carbon Standard issued as Verified Carbon Units (VCUs).
- HHU 10th unit price: AUD 30.00; Carbon credit unit price: AUD 5.00. Stapled unit price: AUD 35.00.

6.3.1.2 Sustainable Financing Modality

- Investment vehicle: Limited partnership special purpose company co-owned by project owner, programme operator, and lender.

- Finance: AUD 30,000 loan secured against project cash flows.
- Interest rate: 7.5%.
- Loan maturity: 25 years.
- Lender: Propose an impact investor.

6.3.2 Project Budget

Project establishment budget (y0-9) (using data provided by SPREP and supplied in Appendix 2).

Year	0	1	2	3	4	5	6	7	8	9
Date	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Project Development										
Project Description preparation	\$20,000	-	-	-	-	-	-	-	-	-
Project MRV methodology	\$5,000	-	-	-	-	-	-	-	-	-
Project validation	\$5,000	-	-	-	-	-	-	-	-	-
Insecticide	\$400	-	-	-	-	-	-	-	-	-
Equipment & protecting gear	\$1,500	-	-	-	-	-	-	-	-	-
Workshop	\$1,000	-	-	-	-	-	-	-	-	-
Freight & Miscellaneous	\$2,000	-	-	-	-	-	-	-	-	-
Local management	\$1,000	-	-	-	-	-	-	-	-	-
Programme operator	\$1,000	-	-	-	-	-	-	-	-	-
Contingency	\$1,000	\$1,000	-	-	-	-	-	-	-	-
TOTAL CAPEX	\$37,900	\$1,000	-	-	-	-	-	-	-	-

Project operational budget (y1-9).

Year	0	1	2	3	4	5	6	7	8	9
Date	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Project Operations										
Antoff bait	\$1,950	\$1,950	\$1,950	\$1,950	\$1,950	\$1,950	\$1,950	\$1,950	\$1,950	\$1,950
Transport	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100
SPC staff (2) fare & DSA	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100
Quarantine staff (2) Fare & DSA	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300
Recruit labour (3) 10 x 10 days	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Local Management	-	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Programme operator	-	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
TOTAL OPEX	\$3,950	\$5,950	\$5,950	\$5,950	\$5,950	\$5,950	\$5,950	\$5,950	\$5,950	\$5,950

6.3.3 Project Financial Performance

Client Information

Client:	SPREP	Area (ha):	7.0
Site:	Motutala Islet	Cashflow period (yrs):	50
Country:	Tuvalu	Activity:	IAS control & biodiversity

Assumptions

Project start	2022	Discount Rate	6.00%
Habitat Hectare Price	\$3,000.00	Loan amount	\$30,000
Project development costs	\$0	Loan interest rate	7.50%
Total HH Units produced	70	Loan maturity (yrs)	25
Average annual HH units	7	Grant funding	\$0

Project Performance

Capex	Capex/ha	IRR	NPV	Loan	Total Interest	Total Repayment
\$38,900	\$5,557	39.0%	\$38,111	\$30,000	\$68,679	\$98,679

Project Pricing

		HH Unit price	CC Unit Price	Stapled Unit Price	NZU Spot Price
		AUD	AUD	AUD	AUD
HH Units	7	\$3,000.00			
HH 100ths	700	\$30.00	\$5.00	\$35.00	\$61.60

The HHU 100^{ths} priced at AUD 35 and stapled to energy sector VCU carbon credits priced at AUD 5.00.

The stapled combination of units is priced at AUD 35. For comparison and conceptually testing the likely willingness to pay by carbon buyers the stapled unit price of AUD 35 has been compared with the NZU spot price in the New Zealand Emissions Trading Scheme which sets a benchmark for voluntary carbon credit pricing in the New Zealand voluntary carbon offsets market. At the time of writing the NZU spot price was NZD 64.50 which converts to AUD 61.60. Voluntary carbon buyers in the New Zealand offsets market have proven to pay a premium above the NZU spot price (e.g., NZD 10 higher than the NZU spot price). This indicates a plausible market in New Zealand for these units.

Note also that the HHU unit price is not modelled to rise in real terms across the cash flow period which means that there is also room for raising the HHU price, if necessary, to fund additional activities not covered in the initial budget.

The financial success test for the loan investment: no negative cumulative cash flows across the 50-year project period (i.e., the project bank balance never goes below zero). Key financial metrics including the HHU unit price, the interest rate, the loan amount, and the amount of annual debt servicing were adjusted up and down until the financial model succeeded.

6.4 OTHER FINANCING OPTIONS

The core of the above two business model examples (Mt Talau and Motutala) is the alignment of an annualised budget with a unit-based revenue stream. This combination of budget and revenue stream can be used in several different configurations and business models. Furthermore, some business models will not require unit-based outcome delivery.

For example, other configurations of these same core budgets and revenue requirements could include:

Revenue Stream	Financing Modality	Remarks
Payment for Ecosystem Services	Environmental Trust Fund	ETF could be sourced with Debt-for-Nature swaps or a grant.
Payment by Results	Environmental Trust Fund	ETF could be sourced with Debt-for-Nature swaps or a grant.
Biodiversity Credits	Impact Bonds	Would need to be large scale programme
Biodiversity Credits	Crowd Funding	Suitable for small scale
Biodiversity Credits	Impact Investment + Catalytic Capital	Suitable for small or large scale

6.5 OTHER BUSINESS MODEL OPTIONS

6.5.1 Caribbean IAS Trust Fund

A GEF and UNEP funded project *Preventing the Costs of IAS in Barbados and the OECS* has released a 2021 policy brief for decision makers in the Caribbean on actions needed to address the problem of IAS. It concludes that a **Caribbean IAS Trust Fund** is the most feasible financing option for managing IAS that are a common threat to the wider Caribbean.

This conclusion is based on the understanding that prevention is more effective than control. To achieve this, a sustainable and dedicated source of funding needs to be available and easily accessible. Due to budget constraints facing Caribbean governments, an Environmental Trust Fund is proposed as the financing modality. Key recommendations to establish and manage the ETF include:

- For the trust to be established under the existing umbrella 2012 Caribbean Biodiversity Fund (CBF) to limit establishment and governance costs.
- A resource mobilisation strategy, blending endowments with collection of various user fees and taxes e.g., a percentage of airport departure taxes or even more appropriately, cruise ship port fees.
- Asset management that defines the ETF's investment strategy and its use of endowment, revolving and/or sinking funds to maximise returns. Previously, analysis proposed that initial endowment of USD 50 million, will yield financial sustainability in a few years, with annual returns of up to USD 1.2 million depending on economic conditions. Due to poor economic conditions at present, in addition to an endowment strategy, it also recommended that the IAS Trust Fund incorporates sinking and revolving strategies initially (while building its endowment).
- Reporting, Monitoring and Evaluation system to communicate the Trust's effectiveness (to help attract additional capital).
- All Trust operations and activities to be based on a systemic plan for IAS prevention and control.

6.6 INSTITUTIONALISATION OF PROJECT-FUNDED STAFF

Sustainable business models are designed to financially sustain the specific IAS control intervention. The exemplar business models presented above involve an example of an on-going project that could potentially continue in perpetuity (the Mount Talau National Park) and an example of a project with a fixed timeframe.

6.6.1 On-Going Initiatives

Projects that secure on-going revenue streams to service their on-going financing and intervention needs will often have budgets that vary through time as the IAS control effort goes up and down. For example, a pest control programme may have a high pest population at the beginning of the business model, and then a much lower population (or zero population) through time resulting from effective IAS control measures. In this situation, staff effort required to service this business model will go down through time, potentially transitioning from intensive pest control at first and thereafter focusing mostly on monitoring and subsequent control of pest populations that invade the area or whose population rises periodically.

Staff time allocated and funded by the sustainable business model will need to be managed to align with these IAS population dynamics – otherwise the cost declaration justifying the annual cost will be unjustifiable (because staff will be being paid for work that is not needed).

There are different ways to manage this kind of situation and are the kinds of considerations common to staff resourcing in any business. These include resourcing options presented in Table 6.7.1:

Table 6.7.1. Human resourcing options for enduring employment and their implications for management and staff.

Resourcing Option	Implications for Manager	Implications for Staff
Recruit staff on a narrowly defined contract basis, adjusting their hours in each annual contract based on the IAS control effort required for that year.	Low risk to manager. This helps the project manager avoid having to pay staff for work that is not justified in, and not funded through the sustainable business model.	High risk to staff. This exposes the staff to inconsistent employment from this project. Staff could gain other contracts to build their annual workload to match their desired workload (e.g., full time). Staff can then price their daily/monthly rate in a way that reflects the overheads and risk inherent in contracting.
Recruit staff as employees in a more broadly defined contract that goes beyond the scope of the specific IAS sustainable business model and maintains their paid time evenly year on year.	High risk to manager. The manager could allocate this/these staff to other projects in any given year where those other projects are funded either through grants or an additional sustainable business model. This is how many consulting firms operate.	Low risk to staff. Staff have confidence that they will have secure employment so long as the management entity does not go out of business. Staff rates of pay reflect this low risk (i.e., lower equivalent daily/monthly rate pay compared with contracting).
Recruit staff as employees in a contract that aligns with the scope of the specific IAS sustainable business model but broadens the scope of the IAS business model to include a range of activities funded by that business model.	Low risk to manager. The manager can allocate this/these staff time across a portfolio of activities, some of which are not time sensitive and can be delivered when IAS control activities reduce. Examples include track work, fencing maintenance, signage, additional conservation management that adds value to the conservation area.	Low risk to staff. Staff have confidence that they will have secure employment and can have confidence that the management entity has less risk of going out of business. Staff rates of pay reflect this low risk (i.e., lower equivalent daily/monthly rate pay compared with contracting).

6.6.2 Fixed Timeframe Initiatives

When an IAS control intervention has a finite timeframe (e.g., eradication of an IAS on an island) the success of the project is measured partly by the way that staff make themselves redundant for that activity in that location. Maintaining security of employment for staff in these kinds of projects depends on whether the sustainable business model is focused on a particular IAS intervention (i.e., sustainable for the duration of that intervention only), or whether it is focused on several IAS interventions (potentially sustainable in an on-going manner).

When a sustainable business model is focused on several IAS interventions (i.e., an aggregate of individual sustainable business models) it has the character of a consulting business. The task for the manager of this business is to undertake business development to secure multiple sustainable business opportunities that either run sequentially, or in parallel. This is the fundamental challenge of any consulting business.

Options for enabling the manager to be capable of designing, managing, and sustaining multiple sustainable business models include recruiting a manager who already has experience in managing multiple business models or training existing managers to acquire these skills.

6.7 SUPPORTING ONGOING COMMITMENTS BY COMMUNITIES

Communities that are committed to sustaining IAS activities in an on-going manner will need to develop a sustainable business model (or have one developed for them) and an institutional structure that is ready for engaging in sustainable financing. A possible framework is presented that could be used to deliver this readiness. This includes community consultation and co-design of sustainable business models and developing an effective sustainable business organisational structure to operate these business models.

6.7.1 Community Consultation & Co-Design

Undertake community consultation to:

- Identify the IAS interventions sought by the community.
- Identify non-IAS conservation management outcomes sought by the community.
- Co-design sustainable business models for the IAS interventions.
- Co-design sustainable business models for non-IAS interventions.
- Engage an existing entity or establish a new entity to manage and operate the sustainable business models. Existing entities could include villages and/or schools that elect to adopt a natural area for continuing invasive species management. A new entity established for this purpose could be co-owned and co-governed by the community and an external support entity that provides technical and financing support.

6.7.2 Establishing a New Sustainable Business Management Entity

Coordinating sustainably financed community IAS initiatives can be a complex undertaking involving the integration of a) local participation in design, management, and leadership with b) external capability and resources.

Without effective local input and local control, the initiative will likely:

- Lack local buy-in and not be locally led.
- Be designed in a manner that is incongruous with local needs and aspirations.
- Be exposed to considerable internal risk.

- Be socially, culturally, and financially unsustainable.

Without effective external capability and resources, the initiative will likely:

- Be exposed to technical risk that can prevent the delivery of verified outcomes, and thereby prevent access to sustainable revenue streams.
- Be at risk of not gaining access to the preferred sustainable financing modality.

For these reasons, the development of appropriate enabling infrastructure can be a necessary step for sustainable financing. This infrastructure can include:

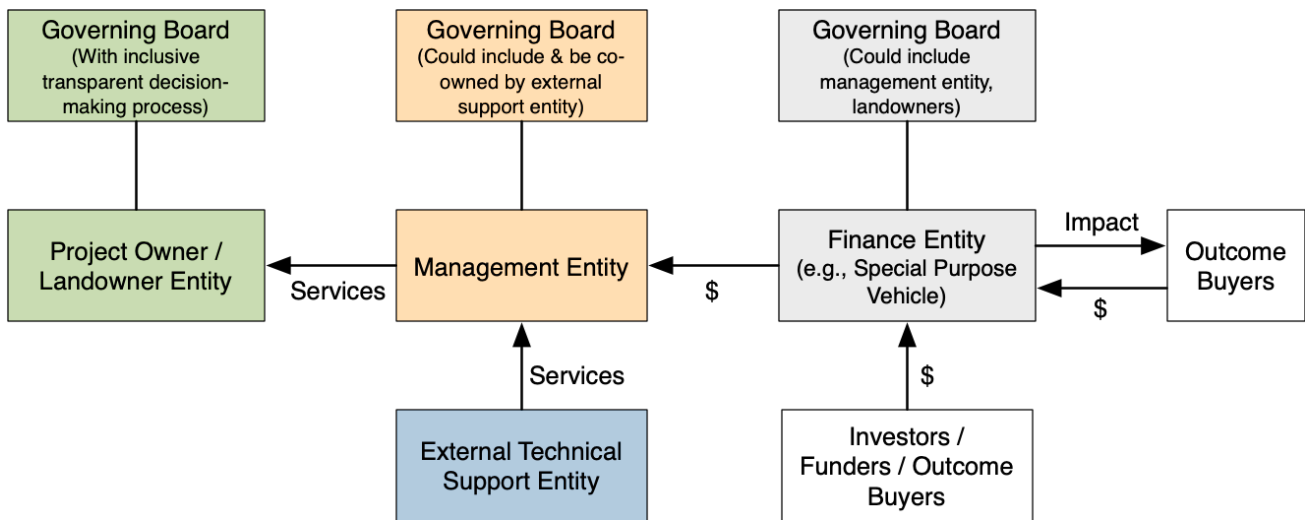
- A project owner entity (e.g., community company or trust) that represents the owners of the natural resource on which the IAS activity is to occur and will be the counter party to any transaction with a supplier of sustainable revenue streams.
- A governance entity for the project owner entity (e.g., existing community governance structure or a specially designed governing entity for the IAS control initiative) that provides transparent decisions on the IAS control activities and associated financing arrangements.
- A management entity that coordinates IAS control operations (including employing staff and engaging subcontractors) and operates their part of the sustainable business model.
- A governing board for the management entity that:
 - Defines and safeguards the business “DNA” of the management entity (e.g., constitution, vision, mission statement).
 - Safeguards the financial discipline of the management entity.
 - Can represent the management entity in advocacy and financing.
 - Represents and safeguards the dual and mutually reinforcing interests of:
 - a) The local community and its aspirations (the local operational partner).
 - b) The external technical and financing capability (the external operational partner).
- An external support entity that provides technical and financing support to the management entity.
- A financing entity focused solely on safeguarding the dual interests of:
 - a) Representatives of the management entity.
 - b) Representatives of the sustainable financing modality.

This financing entity could be the management entity or could be a separate special purpose entity with the sole purpose of managing funds entering and exiting the initiative – a special purpose vehicle (SPV).

A key advantage (and purpose) of a SPV structure is that it provides an external cash provider with the opportunity to secure their investment against co-ownership of the sustainable business model and its cash flows (by owning shares of the SPV). This is instead of the local community having to provide collateral of equal value to a loan (if a loan is involved).

Some components listed above are already common to grant-funded IAS initiatives. See Figure 6.7.2 for a diagram of a potential organizational structure. Also, see Appendix 3 for a template for developing a sustainable financing plan.

Figure 6.7.2. Potential organizational structure for sustainable business management entity.



If the establishment and coordination of multiple entities such as those described above is beyond the capacity of local communities, then such coordination may need to be supplied through a regional entity like SPREP, a purpose-built entity governed or co-governed by SPREP, or an independent entity designed for this purpose (or a combination of the above).

Either way, sustainable financing will ultimately depend on the organisational structures, measurement reporting and verification protocols, and financial discipline sufficient to meet the requirements of sustainable revenue streams and sustainable financing modalities. This kind of structure and its management may be new to some IAS control delivery entities but is common to entities involved in sustainable financing in other sectors, either in the region and/or in countries outside the region.

One way to progress sustainable financing for IAS among PICTs is to develop a pilot activity or activities in a manner that establishes and engages an entity structure such as those described above. In this way a pilot activity would demonstrate the technical, financial, and institutional arrangements required for sustainable financing. Once a pilot has been delivered, the institutional arrangements have been validated, and a relationship with sustainable revenue stream counterparties (e.g., outcome buyers) and sustainable financing modalities has been established, the option would exist to start scaling up.

Scaling up can then be driven by a business case that determines the scale of activity at each stage of scaling. In turn the scaling model can be designed to keep pace with institutional capacity of delivery entities. An example here is scale-up phases based on institutional capacity:

1. Crawl (e.g., up to 5 projects either in a country or spread across countries and with a capital requirement of up to USD 100,000 each).
2. Walk (e.g., up to 20 projects with a capital requirement of USD 500,000 each).
3. Run (e.g., no constraint on the number of projects or their size and implemented based on a cycle of capital raising to a combined threshold (e.g., USD 20 million for each capital raise).

7 Conclusion

Many sustainable financing options exist for IAS control across the Pacific Islands. Some are more suitable for short term solutions and others are more suited to longer term strategic developments. This is particularly relevant for the implementation of a sustainable financing programme for IAS that uses different revenue streams and financing modalities across a range of different IAS management challenges.

Sustainable financing involves a sustainable revenue stream combined with a sustainable financing modality, brought together in a sustainable business model. The potential ingredients for a sustainable business model include the following revenue streams and financing modalities:

Sustainable Revenue Streams

- Taxes & levies.
- Fees.
- Fines.
- Results-based payments.
- Payment for Ecosystem Services (PES).
- Carbon markets.
- Biodiversity credits.
- Revenue from sales.

Sustainable Financing Modalities

- Impact bonds.
- Pooled funds.
- Partnerships for a public purpose.
- Crowd funding.
- Catalytic capital.
- Debt-for-Nature Swaps (DNS) (could be either revenue stream or financing modality).
- Grants.

The core of a sustainable financing initiative in IAS is the relationship between costs and revenues required to meet these costs for the IAS management intervention across a project period or in perpetuity. Once this has been determined there are many potential ways to integrate this information into a sustainable business model.

The exemplar sustainable business models presented in this report provide an example (using placeholder budgets only) of how a budget can be aligned with an impact measurement protocol to demonstrate value for money to an outcome buyer/funder.

The core purpose of an IAS control sustainable business model is to sustain the financial resourcing for the delivery of the IAS control outcome. If there is a need to sustain staff in an IAS control programme beyond the boundary of a particular sustainable business model (i.e., beyond the timeframe of an IAS project, or to create a fulltime equivalent position when the IAS project can only supply less than full time employment), then the sustainable business model will need to be situated within a broader financing strategy for the organisation delivering these services. This is no different to the funding challenges faced by non-profit organisations, or the commercial challenges faced by consulting firms. These resourcing challenges will need to be addressed through additional revenue streams from additional activities. This is the core responsibility of a management entity tasked with coordinating sustainable business models.

Supporting ongoing IAS control commitments by communities will similarly need to develop a business model capable of delivering this on-going support. In turn, this may require the development of an organisational structure capable of driving a sustainable business model with sufficient scope to deliver this on-going support.

This organisational structure will likely need to include a local community entity, a management service provider, and potentially a financing entity to enable the inflow of revenue from a sustainable financing modality. If the establishment and coordination of multiple entities is beyond the capacity of local communities, then such coordination may need to be supplied through a regional entity like SPREP, a purpose-built entity governed or co-governed by SPREP, or an independent entity designed for this purpose.

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9 Appendices

APPENDIX 1: POTENTIAL SOURCES OF EXTERNAL INVESTMENT

International Government Aid Budgets

Bilateral aid providers are already a significant source of grant financing into the Pacific and have potential to play a more prominent role in providing catalytic capital and impact first investment.

Grants

Major grant funders, in order of significance:

- New Zealand, 64.88% total aid budget (comprising 0.28% of GNI) is allocated to the Pacific Island region (NZD 265 million spent between 2010-2018 on 388 projects).
- Australia, 36.66% total aid budget allocation to the Pacific Island Region (AUD 920.8 million spent between 2010-18), on 4,320 projects between 2010-18).
- China: Aid budget to the Pacific varies. Has spent USD 241 m in the Pacific Island region between 2010-2018 into 77 projects. Notably, China has committed to help Pacific Island nations mitigate and manage the impacts of climate change and to provide funding to meet these commitments.
- Japan: 1.65% aid budget (comprising 0.28% GNI) allocated to Pacific Island Region (USD 219.19 million spent between 2010-2018 on 874 projects).
- United States: 5.22% aid budget (comprising 0.16% GNI) allocation to the Pacific Island Region (USD 186.35 million spent between 2010-2018 into 331 projects).

Notably, grant finance from those countries signed onto the COP16, committing developed countries to the goal of “mobilizing jointly USD 100 billion per year [of climate finance] to address the needs of developing countries,” is expected to increase. Largely, this is due to a failure to meet this commitment so far and renewed pressure to do so. At COP21 developed countries parties expressed an intention to continue their existing collective mobilisation goal (USD 100 billion per year) through to 2025. More recently, the UN’s independent Expert Group on Climate Change has called on all bilateral donors to live up to their climate finance commitments and set more ambitious targets; “The need for grants, in particular, is of even greater importance relative to pre-Covid.” Given that climate change impacts are projected to escalate in the Pacific, there is an opportunity to access climate-related grant funding from bi-lateral donors.

Catalytic Capital and Impact Investment

The western models of development aid have traditionally been grant-based and does not encompass Impact investment. The advent of the South-South aid model, built on the philosophy on win-win’ and equal partnership and encompassing concessionary financing structures, is starting to shift this model. China, in particular, has been providing *concessionary debt* in the form of soft loans to developing countries for decades. The Pacific Islands region has been a significant recipient of concessionary debt from China (well over USD 200m between 2010-2018). While this has come with both pros and cons (e.g., debt distress) – westerns donors such as Australia and New Zealand are seeking to take the best aspects from the South-South model in exploring financing beyond grants.

- Australia: Emerging Markets Impact Investment Fund (EMIIIF) is an impact investment fund that is an initiative of the Australian Government Department of Foreign Affairs and Trade (DFAT). It is managed

by Sarona in a Consortium with MEDA and Volta as technical assistance provides and the Whitelum Group which assists in monitoring and evaluation. EMIIF provides investment capital and technical assistance to venture and early-stage capital funds, private debt funds, and Non-Bank Financial Institutions (SME funds) that support SMEs to grow in South Asia, Southeast Asia and the Pacific. EMIIF seeks to catalyse other impact investors including gender lens investors. EMIIF is a development financing mechanism for investing for impact. It helps SMEs to grow in ways that both generate profit as well as social, environmental and governance benefits, with a cross cutting focus on gender equality. <https://emiif.fund/>

- New Zealand: Investment News reported in late 2020 that Brightlight Group is working with the NZ Ministry of Foreign Affairs and Trade (MFAT) to design a public-private impact investing strategy for the Pacific Islands. This will involve the establishment of InvestPacific, a USD 50 million fund targeting mid-sized investments that require patient capital and deliver inclusive and sustainable development outcomes. <https://www.brightlightimpact.com/>
- Beyond Australia and New Zealand, China remains an obvious source of concessionary capital (from the China Development Bank (<http://www.cdb.com.cn/English/>) and the Export-Import Bank of China (CEXIM)) (<http://english.eximbank.gov.cn/>).
- China also provides an opportunity for ‘debt-for-nature swaps’ financing, as many Pacific Island Countries are heavily indebted to China. China has a well-established precedent of debt forgiveness in Africa to build diplomatic ties. More recently, in response to an agreement to support the world's poorest countries during the coronavirus pandemic, China and the G20 announced debt relief for 77 developing countries, including 40 in sub-Saharan Africa.

Public Development Banks and Multilateral Funds

Public Development Banks (PDBs)

Public Development Banks (PDBs) also know Development Finance Institutions, are financial institutions with a mandate to finance a public policy on behalf of the State. They have independent financial and legal status, but operate under the authority and supervision of government. PDBs are a very diverse set of institutions. In total, there are around 550 institutions globally identify as PDBs, which can be classified as multilateral, bi-lateral, regional, national and sub-national. Financing by PDBs is significant in itself, amounting to c. USD 2.3 trillion annually or about 10% annually of all private and public financing.

Given their public mandates, authority and supervision, combined with their significant scale of assets and financing, PDBs have been identified as “perfectly placed” to contribute to biodiversity challenges:

- PDBs can play a catalytic role both in setting ambitious targets toward a nature-positive global goal and supporting the implementation of agreed actions. Beyond simply mobilizing resources by unlocking public finance and leveraging private finance. (WWF Biodiversity Consultancy, 2021).
- At present, only a fraction of PDBs mention the environment in their mandates. Multilateral PDBs and funds have taken the lead and are increasingly providing external financial for biodiversity and conservation related initiatives.
- Multilateral PDBs are a source of grants and catalytic capital (e.g., concessionary finance, loan guarantees, policy insurance, and subordinated equity), to scale up investments into impact-oriented initiatives. The following provides an overview of multilateral opportunities for the external financing for IAS control in the Pacific.

The Global Environment Facility (GEF)

The Global Environment Facility (GEF) operates as the financial mechanism for the major international environment conventions including, the United Nations (UN) Framework Convention on Climate Change, the Convention on Biological Diversity, the Convention to Combat Desertification, and Stockholm Convention on Persistent Organic Pollutants. The GEF funds practical programs and shapes policy reform in developing countries and economies-in-transition for climate change, biodiversity, ozone depletion, persistent organic pollutants, degradation of land, international water systems and promoting sustainable livelihoods. Since GEF's establishment in 1991, it has allocated approximately USD 10 billion to more than 2,800 projects aimed at improving the global environment. Resources are replenished every four years by member states.

GEF investments in PES projects has been significant. GEF has invested USD 70 million in 14 projects where PES is central to the project's design and leveraged an additional USD 395 million in co-financing. GEF has also supported 15 projects where PES is part of the project design but not a core element (GEF USD 73 million and USD 281 million in co-financing), and another 28 projects where PES is only a minor element in the project (GEF USD 82 million and USD 918 million in co-financing). Only a very small portion of the budget for projects in these last two groups targeted the PES elements.

The GEF is pioneering PPPs with the private sector to crowd in capital for PES schemes. The intention to create partnerships that operate "as sustainable long-term instruments to promote private sector participation in the conservation of biodiversity and environmental benefits of global importance." Under the GEF Earth Fund, a USD 50-million PPP initiative designed to enhance GEF engagement with the private sector, the GEF recently approved the Earth Fund Platform Piloting Public-Private Funds for Watershed Protection. The objective of this platform, implemented by the Inter-American Development Bank (IDB), is to support the establishment of at least five Water Funds across Latin America and the Caribbean to pay for the conservation of watersheds that provide water and support biodiversity.

Notably, the GEF has launched a USD 136 million Non-Grant Instrument Program in GEF-7 to demonstrate the application of innovative finance models to combat global environmental degradation.

The GEF offers attractive financial terms as follows:

- Financial terms for private sector:
 - Flexible concessional interest rate.
 - Minimum level of concessions to avoid displacing other finance.
 - First-loss position if justified.
 - Maximum maturity of 20 years.
 - Flexible exit date for equity investments.
- Financial terms for public sector (LDCs/SIDS and Other Recipient Countries):
 - Grace period of 10 years.
 - Interest rate of 0.25% or 0.75%.
 - Maximum maturity of 40 or 20 years.
 - Principal repaid in equal annual payments after grace period.

<https://www.thegef.org/>

The World Bank Group

The World Bank Group provides several avenues for financial support in the Pacific Islands. Those relevant to IAS control include:

- Grants and soft loans for PES.
- Support developing impact bonds and provides guarantees.

- A new Outcomes Fund Multi-Donor Trust Fund, initiated by the World Bank, with an initial contribution from the Foreign, Commonwealth and Development Office of the United Kingdom, housed at the Global Partnership for Results-Based Approach (GPRBA). The Fund will help build the capacity of local markets to use outcome-based financing and other results-based blended finance solutions to drive improved social, infrastructure, and environmental outcomes for poor and vulnerable populations. Its sector focus will include climate, resilience and environment, urban upgrading and provision of basic services, water, sanitation and hygiene, education, employment, and poverty graduation.
- The Pilot Programme for Climate Resilience: Managed by the World Bank, this is USD 1.2 billion fund of grant and concessional finance to support developing countries and regions in building their adaptation and resilience to the impacts of climate change. This fund contains three sub funds: the Pilot Programme for Climate Resilience, the Forest Investment Programme and the Scaling Up Renewable Energy Programme for Low Income Countries.

<https://www.worldbank.org/en/home>

Asian Development Bank (ADB)

ADB provides loans and grants from various funds, of which the Asian Development Fund is the largest. In 2019, the ADB approved the use of results-based lending (RBL) as a regular financing modality for its operations following a successful 6-year pilot period.

Notably, the UNDP report, *Financing the SDGs in the Pacific Islands*, expects funding from the ADB and the World Bank to increase into the Pacific Islands over the next five-years. Largely, this increase will be driven by the USD 100 billion per year climate finance through to 2025. <https://www.adb.org/>

European Investment Bank (EIB)

The EIB lends to projects in the public and private sectors with a strong development impact that promote economic stability, sustainable growth and employment. In the Pacific Islands, the EIB is committed to climate action. The EIB co-invests with other PDBs that operate in the region, such as the ADB and the Green Climate Fund (see below) to increase the resilience of Pacific Islands to climate change. To date, the EIB has invested EUR 700 million (loans and equity) into the Pacific and mobilised EUR 5.6 billion into the region. <https://www.eib.org/en/index.htm>

The Green Climate Fund

This fund forms an integral part of the USD 100 billion per year climate finance commitment and has the specific object to de-risk large investment projects through blended and finance structures. To do so, it provides risk mitigation, such as guarantees, first-loss protection, and grant-based capacity-building programmes. The Green Climate Fund invests across 8-areas of climate action. Those that may be relevant to invasive species management include Forest and land use, Health, food and water security, Livelihoods of people and communities and Ecosystems and ecosystem services. <https://www.greenclimate.fund/>

The Kiwa Initiative

A relatively new pool of EUR 35 million in grants, this multilateral fund is calling for applications (regional nature-based projects open until 15 September 2021). The initiative is aimed at projects addressing climate change via nature-based solutions (e.g., sustainably managing and restoring biodiversity and ecosystem services). Three windows of opportunities: EUR 25,000 to EUR 400,000 for local civil society, international NGOS, local and national public authorities; EUR 1.5 million to EUR 5 million for local and national public authorities, regional organisations, and NGOs.

<https://www.iucn.org/regions/oceania/our-work/deploying-nature-based-solutions/kiwa-initiative>

Philanthropic Organisations

Philanthropic organisations can also provide a valuable source of grant funding to de-risk investments. While they have historically shied away from playing a de-risking role to mobilise finance into impact-orientated initiatives that generate returns – the positive impact outcomes of doing so are gradually normalising this practice.

Private Sector Options

Impact funds and private equity options:

- NatureVest: The in-house impact investing team at The Nature Conservancy – works with colleagues and conservation collaborators around the world to source and structure investment products that support TNC’s mission, to conserve the lands and waters on which all life depends. Investment areas most relevant to invasive species management include ‘forests and carbon’ and ‘ocean protection’. <https://www.nature.org/en-us/about-us/who-we-are/how-we-work/finance-investing/naturevest/>
- Good Return Impact Investment Fund: Good Return’s Impact Investing program identifies SMEs in agricultural value chains that play a vital role in bringing jobs and income to local communities. Focus on SMEs that deliver positive outcomes for women. Uses a funding leverage model to work with local in-country banks to get financing for SMEs ‘across the line.’ Good Return is active in the Pacific – focusing on the Solomon Islands and Tonga. <https://www.goodreturn.org.au/impact-investing-good-return>
- responsAbility: A private Swiss asset manager that makes private debt and equity investments into emerging market economies. <https://www.responsability.com/>
- Brightlight Group: An Australian impact investment management firm – focused on investments to deliver the SDGs. <https://www.brightlightimpact.com/>

APPENDIX 2: BUDGET FOR SUSTAINABLE BUSINESS MODEL EXEMPLARS

Mount Talau, Vava'u, Tonga

Background

Mount Talau is a small secondary lowland forest situated 139 metres above sea level, located behind Port of Refuge in Vava'u, kingdom of Tonga. To preserve the local rain forest and protect endangered endemic plant, bird, and reptile species, the eight-hectare area was designated as a National Park in 1995. Mount Talau National Park is also recognized for its cultural and tourism values. Although small as a forest, Mount Talau has been identified by VEPA as being an important forest area that would benefit from recognition and protection for ecological and cultural values. This will require ongoing management to restore forest and critical ecosystem services.

Much of the original native forest cover of cover of 'Uta Vava'u and the adjacent smaller islands has been removed during the three millennia of human occupation of this group, but remnants of mature forest are still present in some areas that are too steep or rocky for cultivation, including steep coastal slopes and inland scarps and knolls, and on some of the smaller cliff-bound islands. The loss of forests, combined with the introduction and rise of invasive species has led to the extinction of tree and plant species, birds, reptiles and other biological organisms found only in Tonga. To protect the endangered Tongan Whistler, and the *Casearia buelowii* plant species, the fencing of Mount Talau National Park commenced on October 2020. This initiative is part of the Regional Invasive Species Project National Activities, under the Department of Environment.

Biodiversity

- The biodiversity of Mount Talau includes the endemic bird Tongan Whistler locally known as the Hengahenga, whose population has recovered due to the invasive species management. Within a protected fence of Mount Talau is the *Casearia buelowii*, an endemic flora species to Vava'u and known only from Mount Talau.
- The floral and native forest species have been heavily impacted through poor land management and invasive species (pigs and rats) and there are many species that are no longer growing which will be a focus of the restoration program.
- The Tongan whistler (*Pachycephala jacquinoti*), endemic to the Vava'u group, was widespread in and near to areas of primary forest and is not considered under immediate threat. A recent survey of biodiversity in Tonga found that the blue-crowned lory (*Vini australis*), which had not been recorded on Vava'u for over 100 years, was found at two sites.
- In the past few centuries, the forest cover on Vava'u has declined from close to 100% to about 10% today, with concomitant declines in the distribution and abundance of much terrestrial biodiversity, including plants, birds, flying foxes, reptiles, insects and land snails, and the extinction of many species, especially birds and land snails.

Culture

- The myths of Tonga focus on Mount Talau through the stealing of the top of the mountains by the Samoan God. In order to stop the Samoan god from stealing the mountain, the Tongans hid in the bushes opposite Mount Talau. As the top of the mountain was lifted off, the Tongans showed the Samoan god their bottoms, making the top of the mountain get dropped in the waters and forming another island known as Lotuma.

Threats

- The primary threats to the biodiversity of Mount Talau are through invasive species including rat species (*Rattus rattus* and *Rattus norvegicus*), roaming pigs and invasive weed species. Secondly to the animal invasive, the introduction of the Lopa (*Adenantha pavonina*) trees to the islands as an agriculture potential cause significant impacts to the canopy and structure of the forest.
- There is also the need to enhance the forest habitat through reforestation at this site.

Work Being Undertaken

- Since 2015, the Ministry for the Environment, SPREP and VEPA have been coordinating small forest management projects through invasive species control, for the future conservation expanding this work to include community wardens is essential for the ongoing sustainability of forest management.
- Monitoring and management of rat populations is ongoing, as Mount Talau is within the main town area of Neiafu, eradication of rats is not conducive and so bi-monthly monitoring and replacement of traps is conducted.
- In 2020, a fence was placed around the top of Mount Talau to stop the roaming pigs of the community from accessing the fragile forest habitat, within the fence will be the active restoration management.
- Hengahenga, or Tongan whistler (*Pachycephala jacquinoti*), are recovering on Mt Talau following rat control. Rodents have been controlled for four years with statistically significant increases in the number of Tongan whistler (endemic to Vava'u) and other birds such as the Polynesian triller (*Lalage maculosa*) and Polynesian starling. Rats heavily impact the survival and productivity of the Tongan whistler because the birds build an open bowl nest that is easily accessed by rats. The control programme is run by the local community with the assistance of the Vava'u Environmental Protection Association. It uses a rat bait-take database that captures, stores, and reports on bait take at each bait station during the programme and allows analysis of bait take to inform success at lowering the rat population, identify areas of high rat activity, and allow for more economical use of the bait. Hengahenga are now seen and heard in the surrounding area with many Tongans witnessing this bird for the first time in their lives.

VEPA estimation of potential costs over 10 years TOP 90,800 (USD 45,000) – used as the basis of a biodiversity credit project budget and business model.

Activity	Description	Timeframe	Cost (TOP) p.a.	Cost (10 years)
Objective 1: Actively manage the threats from invasive species to biodiversity and to strengthen forest management.				65,000 (USD 32,000)
Equipment	Rat traps, forestry tools for monitoring and managing invasive weeds	10 years	1500	15,000
Human resources (community managers)	Monitoring of rat traps weekly plus removal and management of invasive weeds		5000	50,000
Objective 2: Reforestation of native and culturally important trees.				19800 (USD 10,000)
Nursery	Development of nursery plants for identified native and culturally important species	Years 3-5 (2 years)	2400	4800

Monitoring	Quarterly assessment of canopy and species growth for assessing forest improvement	Years 4-7 (3 years)	5000	15000
Objective 3: Increased forest management capacity through community warden programs.				6000 (USD 3,000)
Training	Training of community forest wardens for securing further protected and recovered forests	Years 1-3 (2 years)	3000	6000 (USD 3,000)

Motutala Islet, Tuvalu

Use of Bait Stations

Application rate per hectare for Antoff® ant bait is 10 kilograms (kg) and so for Motutala Islet which is about 7 hectares will require 70 kg for one application. The bait is recommended to be applied four times in an eradication/management campaign period and so the total of 280 kg will be required. The product package is 12.5 kg per pail and so a total of 24 pails will be required. It is advisable to purchase 6 pails of 12.5 kg of Antoff® to be used in the first year and then purchase another 6 pails in successive years thereafter. The bait is a granulated insecticide that can easily be dispersed manually by hand with proper protective gears on but alternatively spreaders (a proper tool for dispersing the product) can also be used.

Project Costs for Motutala Islet Over 10 Years

Local IAS control estimation of potential costs over 10 years – used as the basis of a biodiversity credit project budget and business model.

No	Description	Total AUD
1	30 pails Antoff ant bait @ \$325/pail (12.5 kg/pail)	9,750
2	Insecticide	400
3	Equipment & protecting gears	1,500
4	Transport	800
5	SPC staff (2) Fare & DSA	11,000
6	Quarantine staff (2) Fare & DSA	3,000
7	Recruit labour (3) 10x10 days	300
8	Workshop	1,000
9	Freight & Miscellanies	2,000
Total		30,000

APPENDIX 3: TEMPLATE FOR SUSTAINABLE FINANCE PLAN

A sustainable finance plan can be developed through the following steps:

1. Project Design
 - a. Priority setting.
 - b. Define target outcomes.
 - c. Define outputs, activities, and budget necessary to deliver short-term outcomes.
 - d. Define impacts and how they will be measured.
2. Project Business Model
 - a. Scope/select sustainable revenue streams.
 - b. Scope/select sustainable financing modalities.
 - c. Due diligence.
3. Seek sustainable financing modality.
4. Develop project.

Project Design

Priority Setting

Priority setting can be undertaken by evaluating a set of IAS goals against a set of criteria such as (and/or modified from) those listed below:

IAS Control Class: Eradiation or High Impact Control Required

IAS Problem	Urgency	Impact	Existing capacity to deliver intervention	Ease of securing external partner support	Score
IAS Problem 1	4	4	4	4	16
IAS Problem 2	4	3	4	4	15
IAS Problem 3	3	4	2	3	12
Etc...					

Rank score: 1 = lowest; 5 = highest.

IAS Control Class: Functional Management Required

IAS Problem	Urgency	Importance	Existing capacity to deliver intervention	Ease of securing external partner support	Score
<i>Merremia peltata</i> at location x	4	4	4	4	16
Sargassum at location y	4	3	4	4	15
Rat control location z	3	4	2	3	12
Etc...					

Rank score: 1 = lowest; 5 = highest.

Define Target Outcomes

A core feature of sustainable financing is a shift from funding inputs (activities) to funding outcomes (impact).

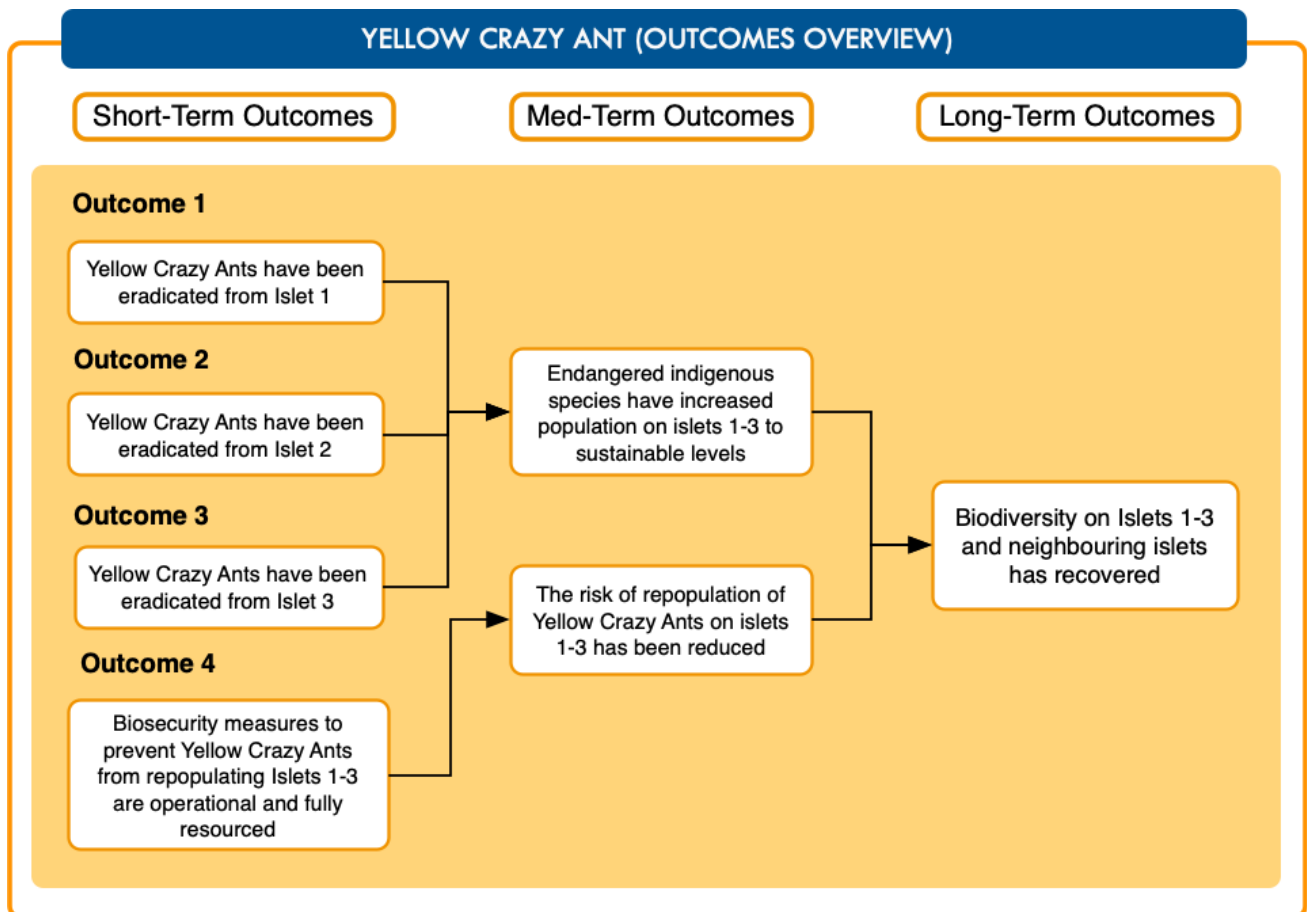
Project management intervention logic models and log-frames identify the causal links between long-term outcomes, medium and short-term outcomes, outputs and activities, and budgets. This can be arranged as follows:

1. Outcomes Overview
2. Intervention Logic Model
3. Impacts and MRV

Outcomes Overview

Identifying specific outcomes that can be integrated into a sustainable financing business model is a core part of the process. This helps to refine exactly what is to be delivered in the sustainable business model and defined as the short-term outcome. This then has a causal relationship with medium-term and long-term outcomes but where the last two are not directly funded by the sustainable business model but are caused or enabled by it.

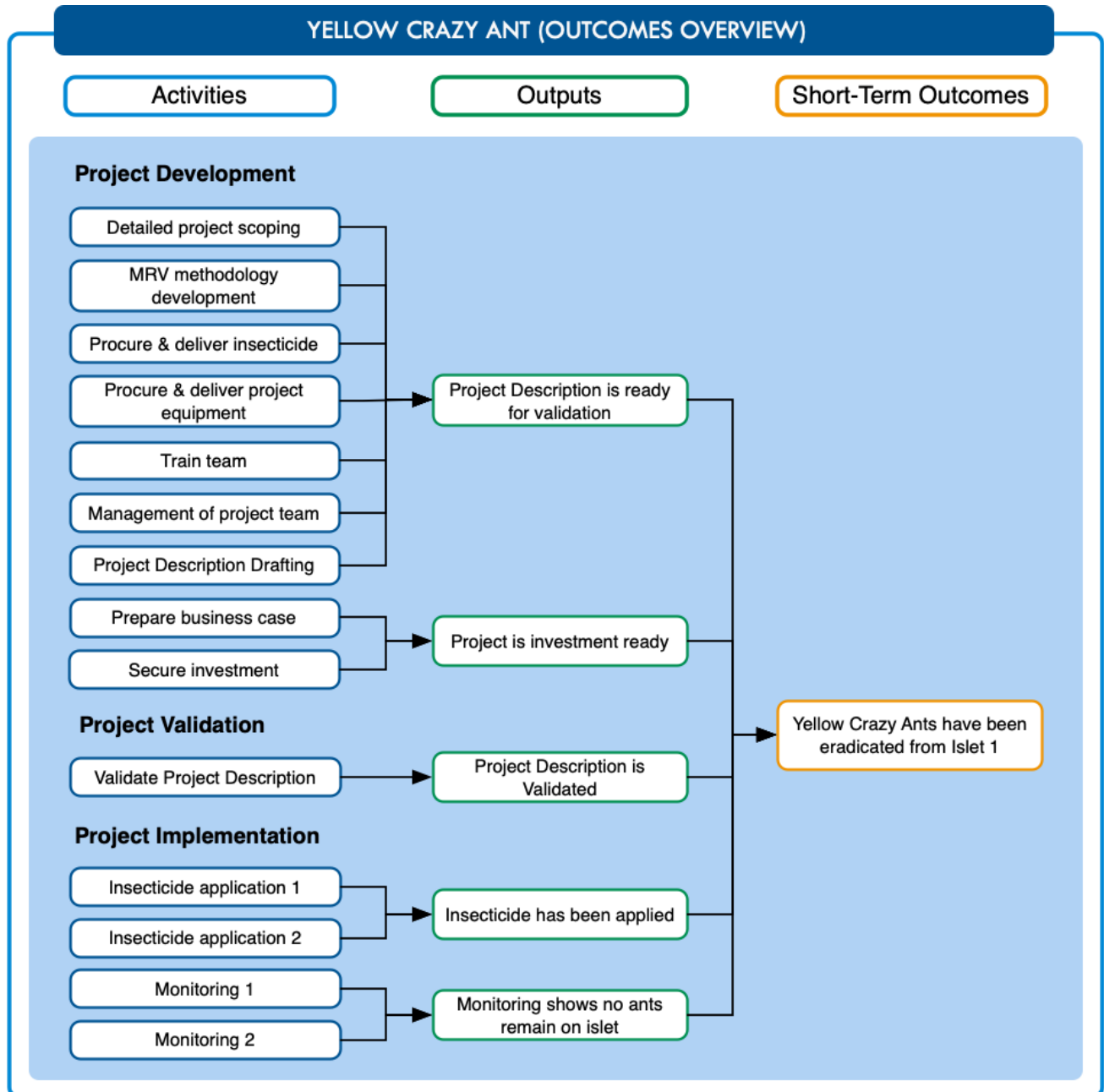
An Outcomes Overview exemplar is provided below:



Define Outputs, Activities & Budget

An intervention logic model helps to define specific outputs that are caused by specific activities. Each short-term outcome is the result of a series of activities that cause measurable outputs. This can be depicted in an intervention logic model (ILM).

An intervention logic model exemplar is provided below:

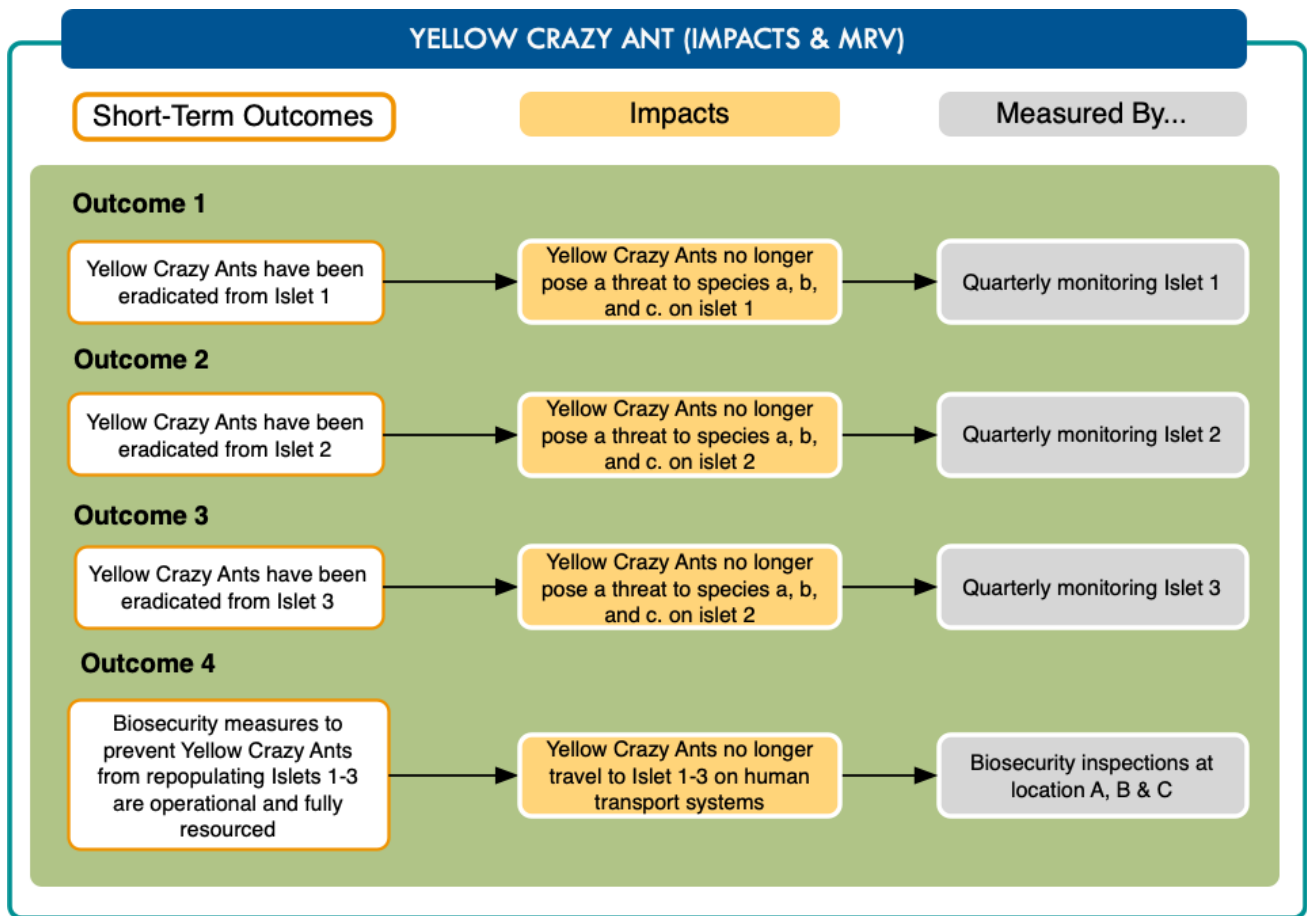


Each activity is enabled by a budget and other resources. A budget spreadsheet can then be developed that has all the activities listed and budget defined for each.

Impacts & Measurement

Buyers of sustainable financing outcomes and sources of sustainable financing investment are buying impact delivery. For this reason, impacts need to be measured, reported and verified (MRV). The MRV plan is captured in the monitoring plan element of the Project Description and delivered during implementation.

An Impacts & MRV exemplar is provided below:



Bottom-Up Project Design

The process of project design can be informed by undertaking a process outlined above, whereby outcomes are broken down to the outputs required to deliver them, outputs broken down to the activities required for them, and activities broken down into budgets and resourcing. When undertaken in this manner, it can be easier to identify efficiencies in the project that are more difficult to see prior to this detailed due diligence exercise. These inefficiencies can then be eliminated from the project which can then be reflected in modifying the wording of outputs and outcomes so that there is a transparent causal chain from budgets through activities, outputs, and impact measurement.

Reporting

The structure of outcomes, outputs, activities, impacts and measurement can be delivered using columns in an Excel spreadsheet and then reported using flow diagrams such as those presented above. These diagrams can be developed using free online diagram software such as:

Online Application	Weblink
Cacoo	https://cacoo.com/
Lucidchart	https://www.lucidchart.com/pages/
Mural	https://start.mural.co/
Diagrams	https://app.diagrams.net/
Diagram Editor	https://www.diagrameditor.com/

The exemplars presented in this report were developed on Omnigraffle (runs on a Mac).

Sustainable Business Model

Define Sustainable Revenue Stream

Defining a sustainable revenue stream involves identifying the best way to create a cash flow for the activity. Undertaking this task may require support from external service providers with experience in sustainable revenue streams. It is important at this stage to scope all possible examples rather than choosing one at the beginning.

Understanding realistic sustainable revenue stream options can be delivered through a workshop with an experienced external advisor during early years until local advisors can supply these support services. It is useful, therefore, to always include a local counterpart to learn from any external supporting service and include a specific training component into activity scoping and implementation.

Once the different options have been considered and a decision made the next step is to identify whether the activity that generates sustainable financing revenue will require any initial funding to establish the activity, and/or cover the cost of it running at a loss during early years until the sustainable revenue stream has built momentum.

If establishment costs and/or running at a loss in early years needs to be funded, then a sustainable financing modality will be required.

Define Sustainable Financing Modality

Defining a sustainable financing modality involves identifying the best way to gain access to some form of investment or borrowed money for the activity. As with defining sustainable revenue streams, this process will benefit from support from service providers with experience in supplying or brokering sustainable finance and can be scoped by means of an interactive workshop with local participants and an experienced external service provider.

Due Diligence

Final decisions on the sustainable business model could be subject to a due diligence process by a nominated financial entity such as an international accounting firm whose role is to safeguard the interests of the local participants.

Secure Sustainable Finance

Because the development of an activity cannot typically take place until it has access to start-up funding, a sustainable financed IAS initiative will need to secure a sustainable financing modality before it proceeds with activity development. The tasks of procurement of a sustainable financing modality could be assigned to a financial management party with experience in sustainable finance brokering. This could be arranged at a regional level through an entity such as SPREP or a new entity designed specifically to procure sustainable financing modalities (e.g., investment).

Secure Sustainable Revenue Stream

Once a sustainable financing modality has been secured it will be possible to develop the sustainable revenue stream activity (i.e., by using start-up funds made available from the sustainable financing modality). This will involve following the procedures mapped out in the Project Description and will often include activities such as determining and calculating a baseline scenario (i.e., what would happen to IAS without the IAS control activity) and determining and calculating a project scenario.