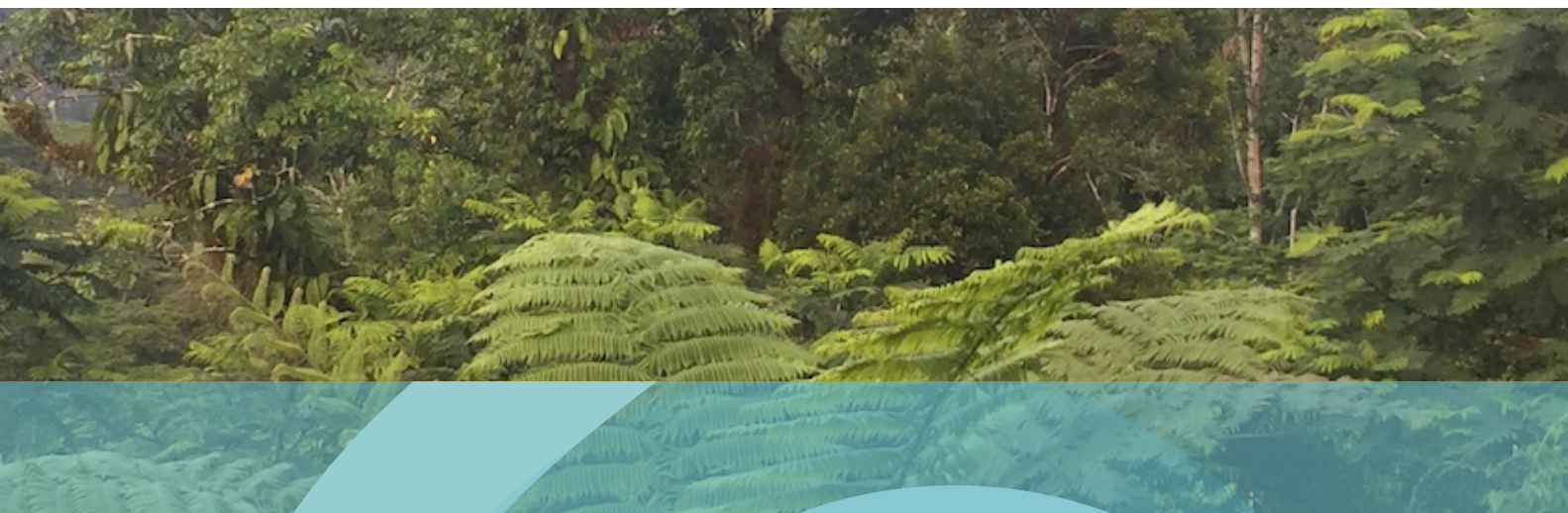
GCF SAMOA INTEGRATED FLOOD MANAGEMENT TO ENHANCE CLIMATE RESILIENCE FOR THE VANSIGANO RIVER CATCHMENT (VCP) PROJECT



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CONCEPT FOR APIA CATCHMENTS PES PROGRAMME

11 March 2019

GCF SAMOA INTEGRATED FLOOD MANAGEMENT TO ENHANCE CLIMATE RESILIENCE FOR THE VAISIGANO RIVER CATCHMENT (VCP) PROJECT

Concept for Apia Catchments PES Programme

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CONTENTS

ABREVIATIONS

CfW	Cash for work
DRM	Disaster Risk Management
DWR	Department of Water Resources
EbA	Ecosystem-based Adaption
GCF	Green Climate Fund
GIS	Geographic Information System
GoS	Government of Samoa
IWMP	Integrated Water management Plan
IWRM	Integrated Water Resource Management
MAF	Ministry of Agriculture and Fisheries
MNRE	Ministry of Natural Resources and Environment
MoA	Ministry of Agriculture
MoU	Memorandum of Understanding
NPV	Net Present Value
NGO	Non-Government Organization
PES	Payment for ecosystem services
PESP	Payments for ecosystem services program
PUM(A)	Planning and Urban Management (Agency)
SACEP	Samoa Agriculture Competitiveness Enhancement Project
SAFPROM	Samoa Agriculture & Fisheries Productivity and Marketing project
SOP	Standard Operating Procedure
SWA	Samoa Water Authority
ToR	Terms of Reference
UNDP	United Nations Development Programme
USD	US$, United States Dollar
VCP	Vaisigano River Catchment Project
WMS	Watershed Management Services
WRD	Water Resources Division (of the MNRE)

GCF Samoa Integrated Flood Management to Enhance Climate Resilience for the Vaisigano River Catchment (VCP) Project

Concept for Apia Catchments PES Programme

1. EXECUTIVE SUMMARY

Ekos and the Nakau Programme (Nakau) were engaged by UNDP to identify options for a payment for ecosystem services (PES) programme in the Vaisigano River Catchment (VRC) and to undertake a full "pre-feasibility study" for a PES programme, providing assessment of potential project activities and potential for PES asset1 production. This report is a contribution to the GCF and GoS Integrated Flood Management to Enhance Climate Resilience of the Vaisigano River Catchment in Samoa project, referred to as the Vaisigao Catchment Project (VCP).

The purpose of the Payment of Ecosystem Services programme is to protect vital habitats in the Vaisigano River catchment and the ecosystem services they provide for the people residing in the catchment and the broader Apia urban area. The PES programme aims to:

- Improve watershed management
- Protect priority conservation areas
- Investigate long-term sustainable financing options for conservation
- Involve community members in ecosystem monitoring, evaluation and conservation.

Pilot projects were scoped with the following indicative (first level of due diligence) project financial pre-feasibility outcomes:

Summary Output Report

Client: MNRE **Site: Malololelei** **Activity: Reforestation**

						Average Annual Returns to Project			
Area	Trees	Capex Grant	Opex Grant	NPV	IRR	y1-5	y6-15	y16-25	y26-35
ha	planted	$k	$k	$k	%	$k/yr total	$k/yr total	$k/yr total	$k/yr total
40	**40,000**	**$139**	**$37**	**$59**	**12.6%**	**$0.00**	**$6.48**	**$8.74**	**$5.97**
						$/ha/yr	$/ha/yr	$/ha/yr	$/ha/yr
	Total Grant $k: $176					**$0**	**$162**	**$219**	**$149**

Summary Output Report

Client: MNRE **Site: Apia Catchment 1a** **Activity: Reforestation**

						Average Annual Returns to Project			
Area	Trees	Capex Grant	Opex Grant	NPV	IRR	y1-5	y6-15	y16-25	y26-35
ha	planted	$k	$k	$k	%	$k/yr total	$k/yr total	$k/yr total	$k/yr total
200	**200,000**	**285**	**$288**	**$242**	**9.5%**	**($57.50)**	**$35.74**	**$46.96**	**$33.12**
						$/ha/yr	$/ha/yr	$/ha/yr	$/ha/yr
	Total Grant $k: $572					**($288)**	**$179**	**$235**	**$166**

Summary Output Report

Client: MNRE **Site: Apia Catchment 1b** **Activity: Forest protection**

						Average Annual Returns to Project			
Area	Trees	Capex Grant	Opex Grant	NPV	IRR	y1-5	y6-15	y16-25	y26-35
ha	planted	$k	$k	$k	%	$k/yr total	$k/yr total	$k/yr total	$k/yr total
200	**-**	**$140**	**$68**	**$41**	**6.4%**	**$0.00**	**$0.00**	**$6.79**	**$17.19**
						$/ha/yr	$/ha/yr	$/ha/yr	$/ha/yr
	Total Grant $k:	**$208**				**$0**	**$0**	**$34**	**$86**

Summary Output Report

Client: MNRE **Site: Magiagi** **Activity: Reforestation**

						Average Annual Returns to Project			
Area	Trees	Capex Grant	Opex Grant	NPV	IRR	y1-5	y6-15	y16-25	y26-35
ha	planted	$k	$k	$k	%	$k/yr total	$k/yr total	$k/yr total	$k/yr total
50	**50,000**	**$156**	**$45**	**$77**	**13.0%**	**$0.00**	**$8.31**	**$11.13**	**$7.67**
						$/ha/yr	$/ha/yr	$/ha/yr	$/ha/yr
	Total Grant $k:	**$200**				**$0**	**$166**	**$223**	**$153**

A total (placeholder) programme budget was also developed that integrates the pilot project grants and programme development as follows (note that the Programme Development budget can be modified to suit MNRE preferences:

	Y0	Y1	Y2	
Programme Development				
Programme Design V1	$30,000			
Programme Co-Design Workshop	$40,000			
Programme Design V2	$30,000			
Programme finalisation workshop	$40,000			
National Policy integration	$50,000			
Market Access	$50,000	$50,000	$50,000	
Managenent Support Pilot Projects	$50,000	$50,000	$50,000	
Methodology refinement	$50,000			
SDG Certification scoping	$20,000			
Programme protocols refinement	$30,000			
Programme legal refinement	$40,000			
Programme documentation	$40,000			
SDG Methodology development	$30,000			
SDG Methodology certification	$60,000			
Pilot project validation support	$30,000			
Impact investment for scaling up	$50,000	$50,000	$50,000	
Contingency (5%)	$32,000			
Subtotal Programme Development	**$672,000**	**$150,000**	**$150,000**	

Pilot Project Grants	**Capex**	**Opex**		
Magiagi	$155,850	$44,622		
Malololelei	$139,120	$36,565		
Apia 1a	$284,760	$287,506		
Apia 1b	$140,000	$68,310		
Sub-Total	**$719,730**	**$437,003**		
Grand Total	**$1,391,730**	**$587,003**	**$150,000**	**$2,128,733**

1.1. Summary of Recommendations

1. Develop a WMS PES programme that targets existing carbon market opportunities and explores non-carbon PES options for WMS.
2. Ensure that the benefit-sharing arrangements in any PES programme under the VCP are carefully designed to directly address opportunity costs of participating landowners.
3. Ensure close coordination between the VCP PES programme and other government initiatives (such as SAFROM). This can be undertaken by means of an inter-agency workshop that a) identifies areas of potential conflicting priorities and b) co-develops programme solutions that avoid such conflict.
4. Embed weed management strategies within the PES programme and ensure that they are designed to complement reforestation efforts rather than deforestation in sensitive catchments.
5. Maximise opportunities to integrate other VCP activities with PES, such as cash for work and
6. SBEC training, to cover PES development and implementation costs,
7. Design the PES programme to constitute a pilot and demonstration activity for potential replication at broader scale
8. Implement Projects AB and C (Section 4.2). Project A could be completed in the shortest time frame; however its small scale would mean a large investment in project methodologies and development for small returns and impact. Project A is only recommended if MNRE wish to start with a very small pilot activity,
9. PES payments should be sufficient to incentivize or compensate for the opportunity costs of switching from agricultural activities to forest conservation activities,
10. Do not assume PES payments can provide sufficient incentives or compensate for opportunity costs for property development (e.g. sub-division). These issues would need to be addressed through other policy approaches or regulatory activities.
11. Ensure PES projects allow for continued, but managed, customary use of land.
12. Select and organise project participants through a process that considers 'success factors' derived from examples of similar projects and identifies risks that can be mitigated through project design and implementation.
13. Undertake an assessment of options and apply an appropriate legal instrument for forest protection to the PES project areas.
14. Consider leasing (with conditions) as an option for legal protection for PES areas (leasing provides an option for benefit distribution through payment of rents).
15. Enable customary laws to play a role in forest protection on customary land.
16. Ensure PES payments are ex-post and performance based.
17. Where possible, select an appropriate PES Certification Standard that maximizes market access
18. Engage an international Programme Operator to link to international voluntary markets (assuming international markets are targeted).
19. The Samoan Government should guarantee (de-risk) PES payments to landowners; consider payment of lease rents as an option to achieve this,
20. Design the community level benefit distribution scheme in consultation with beneficiaries and consider other successful Pacific Islands models (e.g. Nonu and Nakau).
21. Maximise the opportunities for financing local labour through the CfW activity,
22. Include local employment as a key part of the local benefit sharing mechanism (PES payments used to finance labour),

2. INTRODUCTION

At the broadest level, PES programme design must be capable of making a direct and substantial contribution to achievement of the VCP objectives. This requires that PES projects target land areas within the Vaisigano River and neighboring Apia catchments, and cover sufficient area (project scale) to achieve genuine impact.

The concepts in this report will support the stated purpose of the PES programme from the updated operational manual for Activity 2.2: “to protect vital habitats in the Vaisigano Catchment and the ecosystem services they provide for the people residing in the catchment and the broader AUA. The PESP aims to improve watershed management, notably by involving community members in all processes of ecosystem monitoring, evaluation and conservation.”

The concept presented in this document is structured as follows:

Overview of PES and PES finance. This section provides an analysis of key challenges and requirements that a PES concept design needs to address in order to achieve the VCP and PES activity objectives. An assessment of these factors was undertaken based on desktop review of publications and documents produced from previous MNRE work, and stakeholder consultations undertaken in Apia between 26th–30th November 2018. Where appropriate, recommendations are included under each issue that is described. The recommendations feed into the design of the PES activity.

PES Concept Design. The PES concept design describes options for design and implementation of the PES programme. The design includes recommendations for target groups (and land), governance and institutional arrangements, and describes the necessary steps and activities required to establish a project. The concept design responds to VCP and PES programme needs, as described in the problem description.

Financial feasibility assessment. The feasibility assessment focuses on the financial feasibility of the proposed projects.

3. OVERVIEW OF PES AND PES FINANCE

The PES programme envisaged by MNRE is focused on achieving watershed management services (WMS). Therefore, the solutions offered in this report consider how WMS can be achieved directly by defining the ecosystem services from a watershed protection perspective (e.g. watershed protection hectares, or direct payments for outcomes not associated with 'units').

However, a key challenge is identifying the source of finance and demand (in other words the buyers) for watershed services. In WMS PES programmes, the buyers of WMS are usually the downstream beneficiaries of changes in upstream land management, or alternatively funds are raised by levies imposed on downstream beneficiaries or users by Government. Although there is yet to be a concerted marketing effort, at this stage it is unclear if any company or agency is willing or has capacity to voluntarily purchase watershed management services from upstream sustainable land management stakeholders. Stakeholders' opinions also suggest that raising levies might not be an attractive option for Government in the near term. Henceforth the feedback indicates a significant challenge in procuring the required level of WMS demand, acknowledging that this is relatively untested.

Carbon credits offer a well-established market for PES that already has a regional and international market and market infrastructure. Although the focus of the VCP is on watershed protection, there is significant potential to use carbon sequestration as a 'proxy' to achieve ancillary WMS outcomes. This is because growing and protecting permanent (especially indigenous) forest delivers both carbon benefits and catchment protection ecosystem services associated with forested landscapes. The catchment protection co-benefits represent a climate change adaptation outcome that can be funded through climate change mitigation financing channels (e.g. creation and sale of forest carbon credits). The opportunity for integrating climate change adaptation and mitigation financing and action is recognised by numerous international actors.[1] For example, the FAO[2] have highlighted potential of carbon financing for watershed management and also suggest that carbon balance is also a powerful indicator to appraise the impact of watershed projects.

Forest carbon projects, therefore, can be used as a financing strategy to deliver the core (watershed protection) benefit sought from a catchment management exercise. When indigenous forests are involved, the co-benefits extend to biological diversity enhancement. When the carbon project is carefully co-designed with local communities and supports local jobs and other forms of economic social and cultural development, the co-benefits can extend to key social and cultural outcomes. The full spread of co-benefits can thereby deliver a range of the UN Sustainable Development Goals including: *SDGs 1 (no poverty),* 5 (gender equality), 8 decent work and economic growth), 11 (sustainable communities), 13 (climate action), 14, (life below water), and 15 (life on land).

Furthermore, carbon credits from projects that deliver multiple SDG co-benefits can potentially command higher prices in the carbon market or stronger market access because of their appeal to a wide range of potential buyers.

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[1] *B. Locatelli, G.Fedele, V. Fayolle, A.Baglee, (2016) "Synergies between adaptation and mitigation in climate change finance", International Journal of Climate Change Strategies and Management, Vol. 8 Issue: 1, pp.112-128, https://doi.org/10.1108/IJCCSM-07-2014-0088 Downloaded on: 30 January 2019.*

[2] *M. Bernoux et.al (2011) Carbon sequestration as an integral part of watershed management strategies to address climate change issues; Policy brief.*
http://www.fao.org/fileadmin/templates/ex_act/pdf/Policy_briefs/Carbon_watershed_management_July_2011.pdf. Downloaded on: 10th January 2019

The project concepts developed in this report will therefore incorporate a dual strategy to a) provide opportunity for 'direct' WMS, and b) allow for carbon credits to be used as a financing instrument for WMS.

Recommendation:

- Develop a WMS PES programme that targets existing carbon market opportunities and explores non-carbon PES options for WMS.

3.1. Drivers of Land Use Change

Assessment of PES options will need to address the existing drivers of land use change, such as practices that lead to deforestation or forest degradation. Any intervention will need to recognise and adequately address the drivers. The National Forest Inventory (NFI) found that forest-based carbon stock in Samoa decreased from 1999 to 2013 (-1,567,595 c-ton or -3% against 1999), corresponding to the decrease of the forest area.[3] The deforestation rate in the VRC / Apia catchments however, is much higher at around 17% between 2004 and 2013[4]. This suggests significant drivers are impacting deforestation rates.

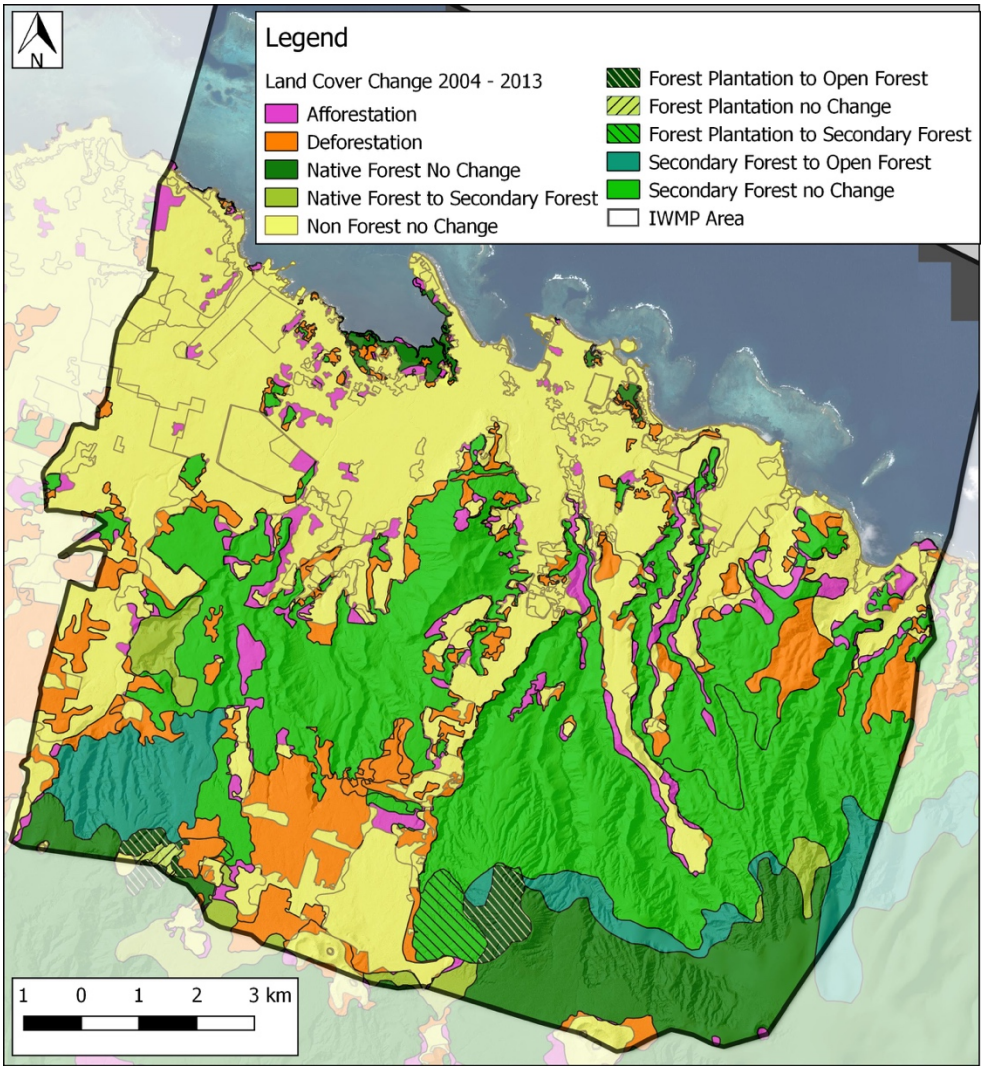
The drivers of land use change generally include economic factors such as the need to generate land-based income through farming and/or subdivision. Figure 1 shows land cover change between 2004 and 2013 in the Apia river catchments. Noteworthy is the significant areas of deforestation in the upper reaches of the catchments (see Figure 1).

Changing population demographics and distribution is another likely driver of watershed degradation. Although the overall population is not growing, MNRE have reported net migration 'up the hill' into the upper catchments around Apia perhaps resulting from greater land affordability outside the city limits. The Greater Apia Integrated Water Management Plan (IWMP) also describes the issue and need for 'managed retreat' from low lying areas as a longer-term response to climate change impacts, as identified in coastal infrastructure management (CIM) plans. With rising sea levels and coastal erosion from climate change, there is significant potential for conflicting goals between upper catchment protection strategies and urban planning highlighting the need for an integrated approach.

[3] *MNRE (2014) National Forest Inventory Report Component 1: Part 2, Ministry of Natural Resources and Environment (MNRE), Independent State of Samoa*

[4] *Greater Apia Integrated Water Management Plan (2018) Appendix A, Land Use, Socio-economic and Demographic Information of the Greater Apia Area, Government of Samoa*

Figure 1. Land cover change in the Apia river catchments between 2004-2013.[5]



Woody weed infestation is a further potential driver of forest degradation. Control of tree weeds may have the effect of causing forest degradation (in terms of cover) in the short term, until such time as native species replace weed trees that are removed. Numerous examples of invasive trees were observed on Andrew Ah Liki's freehold land (Malololelei) and the MNRE bio-reserve (see list below).

Examples of woody weed management and removal are documented in the Mt Vaea Ecological Restoration Project.[6] Trees targeted for removal include:

- Castilla elastica (Mexican Rubber Tree)
- Funtumia elastica (African Rubber Tree)

[5] *Government of Samoa (2016) Greater Apia Integrated Water Management Plan, Volume A, Status, Issues and Directions*

[6] Leatigaga, M. (2010) Mt. Vaea Ecological Restoration project Phase II, Trial phase May 14-3 September 2010) consultants final report, Ministry of Natural Resources and Environment (MNRE) and JICA Samoa.

- Spathodea campanulata (African Tulip Tree)
- Albizia falcataria (Albizia)
- Albizia chinensis (Albizia)

Harmonization with other Government plans and initiatives is also vital to avoid conflicting policies and programmes. For example, the VCP will benefit from coordination with the Department of Agriculture and Fisheries *Samoan Agriculture Competitiveness Enhancement Project* (SACEP) where farmers under the SACEP may be offered opportunities for pasture improvement through supported tree removal.

Generally, the change in land use in the upper Apia catchments appears to be rapid and unsustainable, and supports the notion that in order to address the divers, PES needs to be implemented in combination with land use planning, and strengthened regulation and enforcement, such as through development consent processes.

3.2. Addressing Drivers: Opportunity Cost & Benefit Sharing

Benefit sharing in PES is best understood by employing the concept of 'baseline' or business as usual (BAU) and 'project'[7] scenarios. 'Baseline scenario' refers to unsustainable watershed management practices (e.g. deforestation and forest degradation), and 'project scenario' refers to the sustainable intervention that replaces the baseline (e.g. reforestation and forest protection). 'PES scenario' is a variation on the 'project scenario' that includes carbon financing.

To illustrate the value of PES carbon financing, it is worth looking at a situation that contrasts a baseline scenario and a project scenario in the absence of carbon financing as follows:

> Consider the existing (baseline) situation in the upper Apia river catchments where deforestation produces short-term economic development benefits ('baseline economic benefits') for the landowner who deforests their land. But these baseline economic benefits also create real economic costs to downstream stakeholders in the form of increased flood damage and associated cost of repair and recovery. These costs are not experienced by the upstream landowner who deforested – which is why they are called 'external costs'. Clearly there is an injustice to the downstream stakeholders.
>
> Now imagine a proposed project scenario (e.g. forest protection) designed to replace the baseline but where the project scenario does not include any compensation payments to the upstream landowner. The project scenario delivers little or no short-term economic benefit ('project economic benefit') to the upstream landowner who has been asked to not deforest. Clearly there is an injustice to the upstream landowner.
>
> Predictably, such landowners typically refuse to agree to voluntarily participate in conservation projects on their land.[8] To do so would create a lost opportunity for legally sanctioned economic gain to the landowner – the 'opportunity cost'.
>
> When conservation efforts fail to address opportunity costs, they either do not happen (because landowners refuse to participate) or they happen and cause an injustice to the landowner because they lose income opportunities. Sometimes conservation efforts can replace lost opportunity through other activities (e.g. tourism is sometimes an option but only in certain situations can it adequately replace the baseline benefits).

[7] The term 'project' in this context includes activity-based interventions that are not discrete geographically defined 'projects'.

[8] Unless they were already committed to conservation on those lands and did not need the income from deforestation/forest degradation and associated activities

Now enter PES finance – payment for ecosystem services (or more accurately – payments for environmental management services). Here the PES payment is designed to eliminate the financial opportunity cost and thereby:

a) Directly address a key driver of deforestation and/or forest degradation, and
b) Remove any injustice to the landowner.

Examples of financial opportunity costs include:

- Lost timber revenue from termination of logging.
- Lost revenue from livestock grazing on cleared lands.

Opportunity costs can also be non-financial - for example the loss of a cultural amenity, or of access to resources for subsistence use. An example of where the financial opportunity cost is addressed but where a non-financial opportunity cost is not addressed could include the relocation of rural village families into urban housing (e.g. because of an infrastructure development such as a road). Here the financial value of the new housing may adequately compensate for lost housing, but the fragmentation of the village community and loss of cultural cohesion has not been accounted for.

Accordingly, a key part of the project development process is to analyse financial and non-financial opportunity costs for prospective PES project participants, in order to design a PES project that adequately address/eliminate these costs.

For PES financing to function as intended (i.e. and thereby address conservation opportunity costs), PES revenues (i.e. benefits) must be:

a) Disbursed to (shared with) those who bear the project-related costs, and
b) Of a sufficient amount to cover the project costs in full.

To better understand project costs, it is useful to look at the architecture of PES project budgets and how they can be funded.

3.3. Project Budgets (Pricing and Distributing Financial Benefits)

Opportunity costs are only one component of PES project budgets. PES project budgets will typically include the following elements:

Table 1. Capital and Operational Expenditures

Project Capital Expenditure	
Project development	All technical elements of PES project design and registration (Project Idea Note, Project Description, Validation audit, Project Registration)
Forest establishment	Planting the forest (for reforestation projects only)
Project Operating Expenditure	
Opportunity costs	Compensatory payments to landowners (where relevant) in exchange for giving up income from baseline activities
Conservation management	Pest and weed control, site inspections
MRV	Measurement, reporting, verification to enable issuance of PES units
Project administration	Registry services, risk management, financial administration
Sales and marketing	Monetising PES units

Project establishment involves 'buying or building a capital asset'. Here the capital asset is a PES project that produces PES units annually for the project period (e.g. 30 years). For reforestation projects this will include the establishment of the forest itself. The capital expenditure cost is the sum of costs to establish the project. The capital expenditure budget will be spread across different activities, undertaken by different stakeholders. These stakeholders need to be the beneficiaries of the financial benefits shared in the project as follows:

Table 2. Hypothetical Project Capital Expenditure Budget

Capital Element	**Cost Category**	**Cost Y1**	**Cost Y2**	**Cost Y3**
PES PROJECT DEVELOPMENT				
Responsible stakeholder	**Activity**	$2,000		
Programme Operator	Project Pre-feasibility	$2,000		
Project Coordinator	Project Idea Note	$5,000		
Programme Operator	Project Offtake Agreement	$10,000		
Project Coordinator	Project Description		$20,000	
Auditor	Project Validation		$15,000	
FOREST ESTABLISHMENT				
Responsible stakeholder	**Activity**	$4,000		
Project Coordinator	Consents	$4,000		
Landowner	Land preparation	$10,000		
Project Coordinator	Seedlings	$20,000		
Landowner	Planting		$10,000	
Landowner	Releasing			$6,000
Landowner	Initial pest control			$4,000
Total capital expenditure		**$51,000**	**$45,000**	**$10,000**

Capital expenditure costs will normally be spread over the first few years of the project rather than be incurred in a single year.

Once project development has been completed (i.e. once the capital asset has been acquired) the project asset can then begin to produce ecosystem services and the PES units that represent these services. This incurs on-going operating expenditures required to keep the project going through time.

The operational expenditure budget will typically be spread across different stakeholders as follows:

Table 3. Hypothetical Project Operational Budget and Stakeholders

Stakeholder	Cost Category	Cost	Cost	Cost
Landowner		Y2	Y3	Y4
	Opportunity cost	$30,000	$30,000	$30,000
	Conservation Management	$10,000	$10,000	$10,000
	Project governance	$5,000	$5,000	$5,000
Project Coordinator				
	Project administration	$2,000	$2,000	$2,000
	Co-management	$5,000	$5,000	$5,000
	MRV	$5,000	$5,000	$5,000
Programme Operator				
	Programme administration	$2,500	$2,500	$2,500
	PES Registry services	$500	$500	$500
	Sales and marketing	$10,000	$10,000	$10,000
Total operating expenditure (p.a.)		**$70,000**	**$70,000**	**$70,000**

As can be seen, PES benefit sharing is fundamentally tied to project budgets for doing the work necessary to deliver the stated project outcomes.

These capital and operational cost elements form the cost part of a PES project cost/benefit analysis – undertaken in a project pre-feasibility assessment. The next part of the cost/benefit analysis is to account for the revenue (benefit) part of the equation.

The revenue part of the business model will incorporate two key income categories:

1. Capital investment to cover project capital expenditure (project development).
2. PES unit sales (e.g. carbon credit sales revenue) to cover on-going project operational expenditure.

3.4. Capital Investment for Scaling Up

While the current GCF VCP project has access to grant funding to cover the capital expenditure element of pilot project development, it is worth exploring what might be possible should MNRE decide to expand from a small number of pilot projects to a catchment-wide (and/or) national programme (i.e. scaling up).

Grant funding tends to be far more limited than debt finance. This is because grant money goes out the door and never comes back for the provider. Debt finance in contrast, is disbursed, and then comes back in the form of a return on investment, and the money can then be used again to fund the next project in an on-going cycle. Disbursing money as a loan can, therefore, significantly amplify the beneficial impact of a fixed amount of funds.

When capital is provided as a loan the loan needs to be repaid through the annual project surplus created in the project investment model. It is normal for such projects to be 'cashflow negative' (annual costs are greater than annual revenue) during the early years. Such projects then break even (annual costs and revenues are equal), and thereafter can turn cash flow positive (annual revenue is greater than annual

costs). The lender/investor provides their money at the beginning of the project (to help cause the project to happen), and then has to wait until after the project turns cashflow positive before they receive any payments to start repaying the loan.

Getting this loan fully repaid with interest is much riskier for the investor than putting the same money in the bank (i.e. the project may fail or fail to perform as expected). This is a form of financial risk (risk of not getting your investment repaid). Different types of lender/investor will have different ways of approaching this kind of risk.

Private investors (including commercial banks) will typically either avoid risky projects or require a combination of a) collateral[9] (e.g. cash, other assets, or co-ownership of the project) and b) high interest rates on their money loaned to compensate for this risk. The cost of capital in these situations (i.e. the collateral requirement and high interest rates) can be prohibitively expensive for PES projects. Such projects become starved of project development funds and do not happen at scale but become restricted to a few small pilot projects without any significant impact in a catchment or a country.

Alternatively, PES projects can seek project development funding at a lower cost of capital – the lowest cost is a grant (i.e. zero cost of capital). If grant funding is not available, loan funding could be sought from a lender who can offer money at a lower cost of capital (i.e. an entity that requires a lower-than-commercial return on their money). These sorts of loan funders typically include philanthropic entities, donor entities, and governments (i.e. 'soft loans').

An example might include a government agency like MNRE who uses a capital fund (filled by donor money) as a source of loan finance for PES projects. Here the government lender could offer funds without a collateral requirement (unsecured) and at a low interest rate. Then projects will have access to investment for project development capital expenditure at a cost of capital that they can afford. This is particularly important for projects in a pioneering sector like PES where everything is new and project coordinators and government agencies are learning as they go.

This kind of investment is sometimes called 'impact investment' – where the investor is focused more on the beneficial impact of the loan rather than making a large profit on their investment (but they still want their money back). The impact investment community is growing rapidly globally as more and more financial organisations recognise the need to solve some of the world's big problems like climate change with loan funding at a rate that such projects can afford.

A variation on loan finance is a combination of a grant and a loan. This is a form of 'blended finance.' Here a funding body provides:

a) Grant funding to develop key project and programme infrastructure (e.g. programme design, quality control systems and protocols, technical support, and 50% of the capital expenditure for pilot projects), and
b) Loan finance at a low cost of capital (e.g. low interest rate) for the remaining 50% of project capital expenditure.

[9] Collateral is typically required to be equal to the value of the loan, and which the project is willing to lose if the project fails or fails to perform as expected. If the project does not have this collateral, it cannot secure the loan and will not get the capital funding.

3.5. PES Unit Sales Revenue

The PES project investment model will show the PES unit revenue modelled for the life of the project (see hypothetical example in Table 3). The number of PES units in the hypothetical example below is simply a placeholder example. The actual volume of PES units will depend on the project size and the type of unit in question. The point of the hypothetical example below is to show how the PES unit volume will increase in a reforestation project (because the growth rate of the forest will start slow, speed up and then gradually level off through time), and consequently the PES revenue will increase in real terms[10], even if the PES unit price does not change.

Table 3. Hypothetical Project Revenue Budget

Revenue	Y1	Y2	Y3	Y4	Y5	Y6	Y7
PES unit volume	500	2,000	4,000	8,000	12,000	18,000	20,000
PES unit price	$6	$6	$6	$6	$6	$6	$6
PES unit revenue	$3,000	$12,000	$24,000	$48,000	$72,000	$108,000	$120,000

The ability of a PES project to pay back a capital expenditure loan depends on receiving all of the PES unit sales revenue each year as projected in the project investment model. This means selling all PES units issued each year at the asking price for the duration of the PES project (e.g. 30 years). To do this the PES project needs to secure buyers for PES units, ideally in the form of forward contracts that guarantee the purchase of PES units annually for a period (e.g. 5-10 years) at an agreed price. This is called an 'offtake agreement'.

Implementing a PES project without an offtake agreement runs the very real risk of the project producing PES units but not being able to sell them (or selling only a portion of them). If you sell only half of your annual PES units (e.g. carbon credits) in any given year you will only receive half of your anticipated PES revenue – this is revenue that finances the project operating budget. Receiving only half the operating revenue will require the project to cut the operating budget by 50%. But this might cause the project to fail, because this work will be crucial to the project (otherwise it would not have been included in the project operating budget). For this reason, PES unit sales and marketing effort needs to be included in the project development (capital expenditure) budget.

A Samoa PES programme could have a project development rule that requires the project to have an offtake agreement at the time of project validation (i.e. evidence of offtake agreement included as a requirement in the validation audit).

3.6. PES Unit Price

Approaches to PES unit pricing will differ for different types of PES project. One is to price the PES units at cost and seek buyers willing to pay this price. The other is to attempt to secure the highest price possible in an established market.

Non-carbon PES projects operate in an under-developed mature market where supply and demand dynamics have yet to develop. For this reason, the non-carbon PES project types will need to justify their PES unit price based on a transparent cost declaration. This will need to include project costs in an efficient project budget (including capital and operating expenditures) and show how the unit price is required to cover all of these costs.

[10] 'Real terms' means above the rate of inflation.

Forest carbon projects operate in an existing international carbon market where prices are set in the market as a function of supply and demand. Here buyers willingness to pay will depend on the unit price sought by the project and the availability of alternative sources of carbon credits elsewhere. Average forest carbon prices in the international forest carbon market were around US$6/tCO2e in 2018. Projects that need higher prices in order to break even may struggle to win buyers at scale.

However, projects that deliver a range of co-benefits (sustainable land management, watershed protection, biodiversity conservation, climate change resilience, community employment, gender equality etc.) will command higher prices because of the attractiveness of such top-quality carbon credits. Internationally, the average price for forest carbon credits was US$5.10 in 2017.[11]

The quality of the carbon credits (and the ability to command higher prices) will be reinforced by the certification standards used in the project (more below).

In summary, PES projects need to determine the break-even PES unit price. This can be best calculated using an investment model that determines key project financial indicators such as:

a) Internal rate of return (IRR) (interest rate earned on an investment in the project), and
b) Net present value (NPV) (the present value of the investment (grant or loan) over the life of the project in comparison with an equivalent investment elsewhere).

If the PES unit price is too low, the IRR will be a low or negative percentage number and the NPV[12] will be negative. A negative IRR indicates that the project costs are higher than the project and is not commercially viable).

There are three main ways to raise the IRR in an investment model:

1. Raise the PES unit price.
2. Reduce operating costs in the project budget.
3. Introduce a grant to the project finances.

When raising the PES unit price in an investment model, it is important to link this to the offtake agreement and the buyer's willingness to pay inflated prices. When buyers are price sensitive (i.e. they can buy elsewhere at cheaper prices and are hence sensitive to increases in price) there is a limit to how much it is possible to raise the PES unit price to make it economically viable. Reducing capital and operating costs in the project budget is usually necessary in these situations.

When grant funding is available and can be justified, the project IRR can be lifted without changing the PES unit price by adding grant revenue to project financial model. But this may be an inefficient way of spending money – particularly when considering the fact that there is usually a limited supply of money to solve climate-related problems, and we need to get the best value for money from all money allocated to this task.

[11] Hamrick, K. & Gallant, M. (2018) Unlocking Potential, State of the Voluntary Carbon markets 2017, Forest Trends Ecosystem Marketplace, Washington, USA.

[12] The net present value (NPV) of a project is a measure of the amount of value that a project will deliver above and beyond an alternative investment of the same risk profile (i.e. opportunity cost of capital). The discount rate used in this analysis is 5% (i.e. the project financials are compared with a term deposit earning 5% in a bank). So a NPV of $100,000 means that the project will generate more value than a 5% investment elsewhere, by a margin of $100,000 over its life, and assumes that the bank deposit would be the opportunity cost foregone. The $100,000 is measured in today's value of money. At year 50 this $100,000 of value will be inflated to whatever the equivalent of $100,000 is worth in 50 years. In turn this is calculated by the inflation rate modelled in the project (e.g. modelled using the consumer price index for that country).

Grant funding can be specifically tailored to enable the project to become economically viable but not 'over capitalise' the project – the latter would be inefficient. The adjustment of grant funding volume to a point that delivers a particular IRR and NPV threshold is a good way to prudently allocate grant funding to maximise the beneficial impact of the grant (see Tables 4 and 5).

Table 4. Hypothetical Project Revenue Budget (no grant)

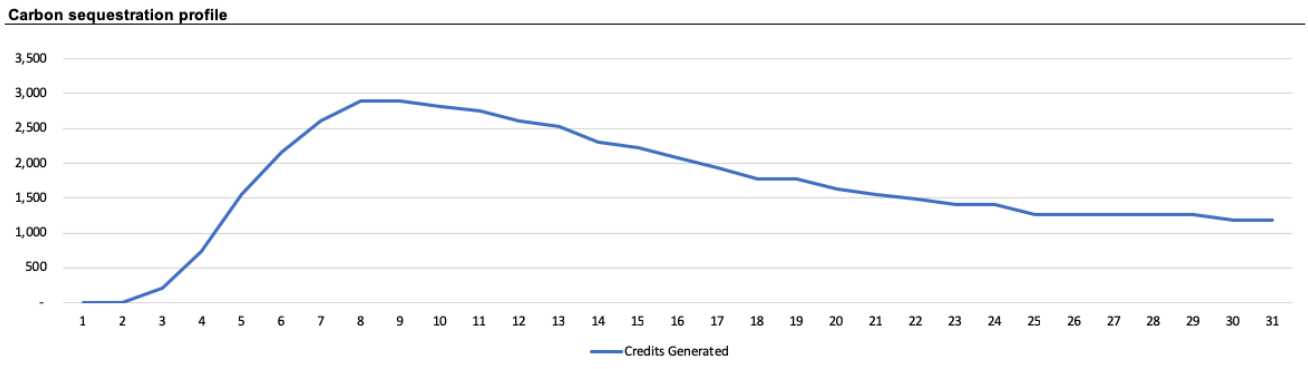
Revenue	Y1	Y2	Y3	Y4	Y5	Y6	Y7
PES unit volume	500	2,000	4,000	8,000	12,000	18,000	20,000
PES unit price	$6	$6	$6	$6	$6	$6	$6
PES unit revenue	$3,000	$12,000	$24,000	$48,000	$72,000	$108,000	$120,000
Grant	-	-	-	-	-	-	-
Cost							
Total capex	$51,000	$45,000	$10,000	-	-	-	-
Total opex	$70,000	$70,000	$70,000	$70,000	$70,000	$70,000	$70,000
Total capex and opex	$121,000	$115,000	$80,000	$70,000	$70,000	$70,000	$70,000
Balance	($118,000)	($103,000)	($56,000)	($22,000)	$2,000	$38,000	$50,000
IRR: -0.6%	**NPV: ($135,000)**						

Table 5. Hypothetical Project Revenue Budget (with $80,000 grant spread over 4 years)

Revenue	Y1	Y2	Y3	Y4	Y5	Y6	Y7
PES unit volume	500	2,000	4,000	8,000	12,000	18,000	20,000
PES unit price	$6	$6	$6	$6	$6	$6	$6
PES unit revenue	$3,000	$12,000	$24,000	$48,000	$72,000	$108,000	$120,000
Grant	$20,000	$20,000	$20,000	$20,000	-	-	-
Cost							
Total capex	$51,000	$45,000	$10,000	-	-	-	-
Total opex	$70,000	$70,000	$70,000	$70,000	$70,000	$70,000	$70,000
Total capex and opex	$121,000	$115,000	$92,000	$70,000	$70,000	$70,000	$70,000
Balance	($98,000)	($83,000)	($36,000)	($2,000)	$2,000	$38,000	$50,000
IRR: 8.3%	**NPV: $120,000**						

Both Tables 4 and 5 show a hypothetical reforestation project with PES units (i.e. carbon credits) increasing through time. This increase in annual PES unit volume relates to the fact that the trees planted in year 0 are growing through time, and that their rate of growth is increasing as they establish their root systems and get access to more reliable sources of water. A longer timeframe (e.g. going out to year 30) would show the carbon credit volume peak and then gradually decline and then level off at a long-term carbon stock per hectare (see Figure 2).

Figure 2 Carbon credit production through time (using a 100 ha New Zealand project example)



Tables 4 and 5 illustrate the impact of blended finance that combines a grant and a loan on the project financial performance. The only difference between these tables is that Table 5 has received a grant of $80,000. The difference between the two can be seen in the internal rate of return (IRR) and the net present value (NPV).

The IRR (interest earned on investment) in Table 4 is -0.6% and the NPV is minus $135,000. In contrast the IRR in Table 5 is 8.3% and the NPV is $120,000.

The project in Table 4 fails to cover all of its costs (but gets close). The net present value in Table 4 is also negative, which means that it performs worse than an alternative investment by a margin of minus $135,000 measured in today's terms. This is still better than the whole project being funded by grant, because this grant would need to add up to the sum of capex and opex over the whole life of the 30-year project ($2.2 million in today's terms). For this project to work, it would still need to have access to a loan of $299,000 to cover capital expenditure ($106,000) and the shortfall in operational expenditure for those four years when the balance is negative ($193,000). This loan would be paid back through time, minus the 6% shortfall. This means that the lender gets most but not all of their money back but may not be willing to participate given that it will come as a net cost to them, as well as a lost opportunity to invest the same amount in another project that delivered higher returns.

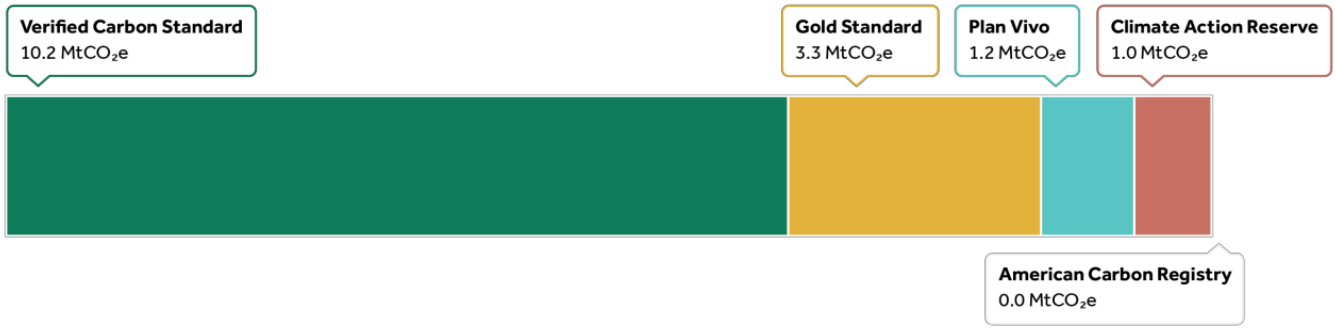
Table 5 shows the beneficial impact of a $80,000 grant on the same project spread across years 1-4. Here all other elements are the same, and instead of needing a loan of $299,000, the project only needs a loan of $113,000. Better still, the project can then deliver an interest rate on that loan of 8.3% (IRR), and deliver $120,000 more value than an alternative investment. Compared with Table 4, this is a far better result for the loan provider and may be sufficient for them to be willing to give the loan in the first place (and thereby enable the project to happen). The red numbers (in parentheses) in the 'Balance' line in Table 5 show negative numbers for years 1-4. This means that the project is cash flow negative for those years and the project is running at a loss at that time. This is normal for any commercial activity, particularly when you had to spend a lot of money at the beginning to develop your project or build your asset (e.g. plant a forest). This is nothing to worry about per se because, through time, the project depicted in Table 5 produces an annual surplus sufficient to repay the loan with interest.

3.7. PES Standards

The ability to command higher prices in the PES market (and especially in the carbon market) is partly dependent on the PES standard used to certify the PES units. For example, the international voluntary forest carbon market has the following carbon standards:

- American Carbon Registry
- Clean Development Mechanism
- Climate Action Reserve
- Gold Standard
- Verified Carbon Standard
- Plan Vivo

Figure 2. Global voluntary carbon market transactions (all sectors) (January-March 2018) by project standard. Source: Ecosystem Marketplace 2018.[13]



Different standards have different reputations in the carbon market, and different relationships with market access. For example, access to the larger carbon credit markets requires a project to issue carbon credits to a standard that has been approved by 'gatekeepers' in those markets. Examples of such gatekeepers include the Australian government's National Carbon Offset Standard (NCOS), and the European International Carbon Reduction and Offset Alliance (ICROA). Both of these demand side standards have lists of eligible offsets that include some but not all supply side standards. Both NCOS and ICROA for example list the Verified Carbon Standard but not the Plan Vivo Standard in their lists of eligible offsets. From a practical point of view this means that gaining access to the relatively large Australian and European corporate voluntary carbon markets will necessitate certifying a project to the Verified Carbon Standard rather than the Plan Vivo Standard. Failure to gain access to these larger markets will reduce the opportunity for a project to secure an offtake agreement and sell all of its PES units.

PES standards are not restricted to carbon standards. In recent years PES standards have developed to support non-carbon PES-type project activities. These standards are focused predominantly on the UN Sustainable Development Goals (SDGs) and include the 'Gold Standard for the Global Goals' offered by the Gold Standard), and the Sustainable Development Verified Impact Standard (SD VISta) offered by Verra (the foundation that owns the Verified Carbon Standard).

Because the projects in the VCP will deliver several of the UN Sustainable Development Goals[14] it remains an option to co-certify carbon projects with either Gold Standard or SD VISta. Also, for any project that seeks to deliver non-carbon PES outcomes, it has the option to certify a project to one of these standards (but not issue specific tradable units) or certify a project and issue non-carbon sustainable development units (e.g. SD VISta asset units).

The returns from a non-carbon PES project would need to be modelled on a case by case basis, and where the PES unit price is determined on a cost-basis. Here, the project capital expenditure and operational expenditure is calculated, an acceptable internal rate of return agreed (e.g. 8%), and then the PES unit price can be retrofitted to the project financial model to deliver that 8% return.

[13] Hamrick, K. and Gallant, M. 2018. Voluntary carbon markets, outlooks and trends. January to March 2018. Ecosystem Marketplace, 2018.

[14] 13 climate action; 14 life below water; 15 life on land; 8 decent work and economic growth; 17 partnerships for the goals.

Recommendations:

- Ensure that the benefit-sharing arrangements in any PES programme under the VCP are carefully designed to directly address opportunity costs of participating landowners.
- Ensure close coordination between the VCP PES programme and other government initiatives (such as SAFPROM). This can be undertaken by means of an inter-agency workshop that a) identifies areas of potential conflicting priorities and b) co-develops programme solutions that avoid such conflict.
- Embed weed management strategies within the PES programme and ensure that they are designed to complement reforestation efforts rather than deforestation in sensitive catchments.

3.8. Scaling from Pilot Projects to a Catchment Programme

Early stages in any pioneering activity come with greater failure risk than later stages. This is also a good reason for pilot projects to be more heavily supported by grant funding than subsequent projects in a programme roll-out. The long-term financing model for PES programmes can involve a number of options along spectrum of fully grant funded at one end, through blended finance (grant and commercial), to fully commercial (fully self-financing) at the other.

Fully grant funded PES projects include situations where a funder (e.g. a donor) is seeking to purchase PES outcomes and would normally have to fund project activities and inputs, but wants to transition to funding measured, reported and verified outcomes. This is a funding model that shifts project delivery risk from the buyer (seller) to the seller (delivery agency). Government funding models in industrialised nations are moving increasingly towards this model as a way to maximise efficiencies in government funding.

Blended finance approaches typically use a blend of grant and debt financing as signalled earlier. Fully commercial activities are able to happen without any government or grant funding support, where the community and the private sector simply get on with the business of delivering PES outcomes independently.

A catchment-wide and/or national PES programme could be designed to transition from a grant funded mode to a commercial mode through time. Transitioning towards commercial PES could be a policy goal of MNRE that implements a PES programme to facilitate such a transition. This could include grant funding to deliver pilot project activities and establish programmatic infrastructure to enable the scaling up of projects within a targeted area initially (e.g. Apia river catchments), and then be extended to a wider national reach thereafter or in parallel. For example, the Forestry Department has interests in reforestation in several parts of Samoa and could pursue these interests through a PES model at the same time as progress is made in the VCP. The key is to complete a demonstration activity as soon as possible, so that key stakeholders have the opportunity to learn from the experience and see how this system works so that it can be applied elsewhere to maximise the beneficial impact of this financing mechanism for catchments throughout Samoa.

Key enabling infrastructure for a catchment-wide and nation-wide programme would include PES methodology development, quality control and quality assurance systems, monitoring systems, governance structures and institutional arrangements, training and support systems that are not yet in place. The Nakau Programme provides many elements of a national programme but could also be tailored to suit MNRE and VCP goals.

Recommendations:

- Maximise opportunities to integrate other VCP activities with PES, such as cash for work and SBEC training, to cover PES development and implementation costs
- Design the PES programme to constitute a pilot and demonstration activity for potential replication at broader scale

4. PROJECT RISK AND RISK MITIGATION

Project risks are identified and strategies to mitigate risks provided in Table 6 (below). The risk rating is derived from the table in Appendix 3.

Table 6: Projects Risks and Mitigation Strategies

Risk	Risk rating	Mitigation
PES objectives conflict with other GoS plans and initiatives, e.g. SAFPROM. For example; one program promoting alternatives to grazing (PES) with another program potentially supporting grazing.	Moderate	• Close coordination across government agencies. • Integrated land use planning to ensure land use activities are appropriate for the location.
Rapid and unsustainable land use in the upper Apia catchments (high rate of land clearing)	High	• Identify and address drivers of land use change • Ensure compliance with existing regulations • Initiate PES program as soon as possible
Landowners / private sector participants may refuse to voluntarily participate in conservation projects on their land if it will cause them to suffer loses or forego opportunities	High	• Calculate opportunity costs for participants • Ensure PES scheme benefits for participants will fully compensate for opportunity costs • Where appropriate, use existing planning regulations to prohibit activities with opportunity costs that cannot be covered by PES (e.g. prohibit sub-division for residential development)
Diversity and complexities of landownership in the VCP and greater Apia catchments.	Moderate	• Clarify land ownership, land boundaries and governance arrangements for land early in project interventions. • Tailor PES project design to land tenure / ownership. E.g. governance and benefit sharing system for freehold land and customary land need to be different.
Difficulty in enforcement of centralized regulations - command and control approaches often fail.	Moderate	• Seek voluntary participation by establishing appropriate incentives (PES), which guarantee payments for landuse change. • Co-design PES systems with project participants (e.g. benefit sharing system) • Empower local decision making; e.g. incorporate customary governance and laws into land management arrangement for PES

Wasted investment if voluntary project participants decide to pull out of the project during the project development phase. E.g. halfway thought project development farmers decide to clear land to establish new gardens or grazing areas	Moderate	• Establish a project agreement: Project participants declare their commitment to project development (at a level similar to an MOU). • Seek co-investment / in-kind investment into projects by participants where appropriate and possible • Develop projects through an engaging participatory process that builds trust and commitment
Voluntary PES / Carbon market prices insufficient to cover project costs (including participant opportunity costs), or project unable to obtain the required volume of PES sales at the PES asking price.	High	• GoS guarantee PES payments (i.e. subsidize where necessary) • Minimise project transaction costs (e.g. through program design and grants) to keep the PES unit price as low as possible • Increase project size; e.g. enable projects to be grouped to increase economy of scale • Identify appropriate PES markets; invest in sales and marketing strategy to identify and secure PES sales
Project leakage – activities that cause land degradation shift from project participant to neighboring non-project participants	Low	• Undertake integrated land use planning • Identify and address drivers of land degradation
Project permanence – participants fail to maintain commitment to land use changes over time	Moderate	• PES payments should be performance based (payments based on achieving outcomes) • Use appropriate legal instruments (e.g. lease conditions) to lock in land use changes • PES agreements should include financial penalties for reversals (e.g. penalty if landowners clear trees that they have been paid to protect).

Project risk in PES projects is typically evaluated by means of a risk assessment methodology as part of the risk mitigation component of project development. The financial purpose of risk assessment is to derive an 'overall risk rating' for each project and use this to assign a self-insurance component to the project financials. This self-insurance component is delivered in the form of a PES unit buffer, which is a percentage of PES units produced by a project annually that are placed and held in a buffer account and cannot be sold. Then should there be a 'reversal' (i.e. loss of PES project integrity due to an event like illegal logging or fire) the project has a reserve of PES units that it can surrender to the relevant carbon standard as a requirement for risk mitigation.

The pilot projects scoped in this report have each assigned a 25% risk buffer, which means that 75% of PES units created by the project are available to be monetised. This 25% allocation accumulates each year in a pooled buffer account held and owned by the PES standard.

5. CONCEPT FOR APIA CATCHMENTS PILOT PROJECTS

Three potential projects were identified through consultations with the MNRE divisions, landowners and stakeholders. These are presented as two scenarios, the first where projects A & B are considered as separate projects and the second where projects A & B are combined and referred to as *Project AB*.

5.1. PES Project Options

Project A: "Malololelei PES reforestation demonstration activity".

> *Purpose: small-scale proof of concept activity; designed to establish and test the PES 'system' and promote participation in larger projects (Andrew Ahleke freehold and MNRE reserve).*

Project B: "Apia catchment reserve project".

> *Purpose: Intermediate scale impact activity designed to scale (freehold land).*

Project AB: "Apia integrated catchment reserve project" (combines options A & B).

> *Purpose: Intermediate scale impact activity designed to scale (combined freehold land and MNRE reserves).*

Project C: "Magiagi forest conservation and reforestation project".

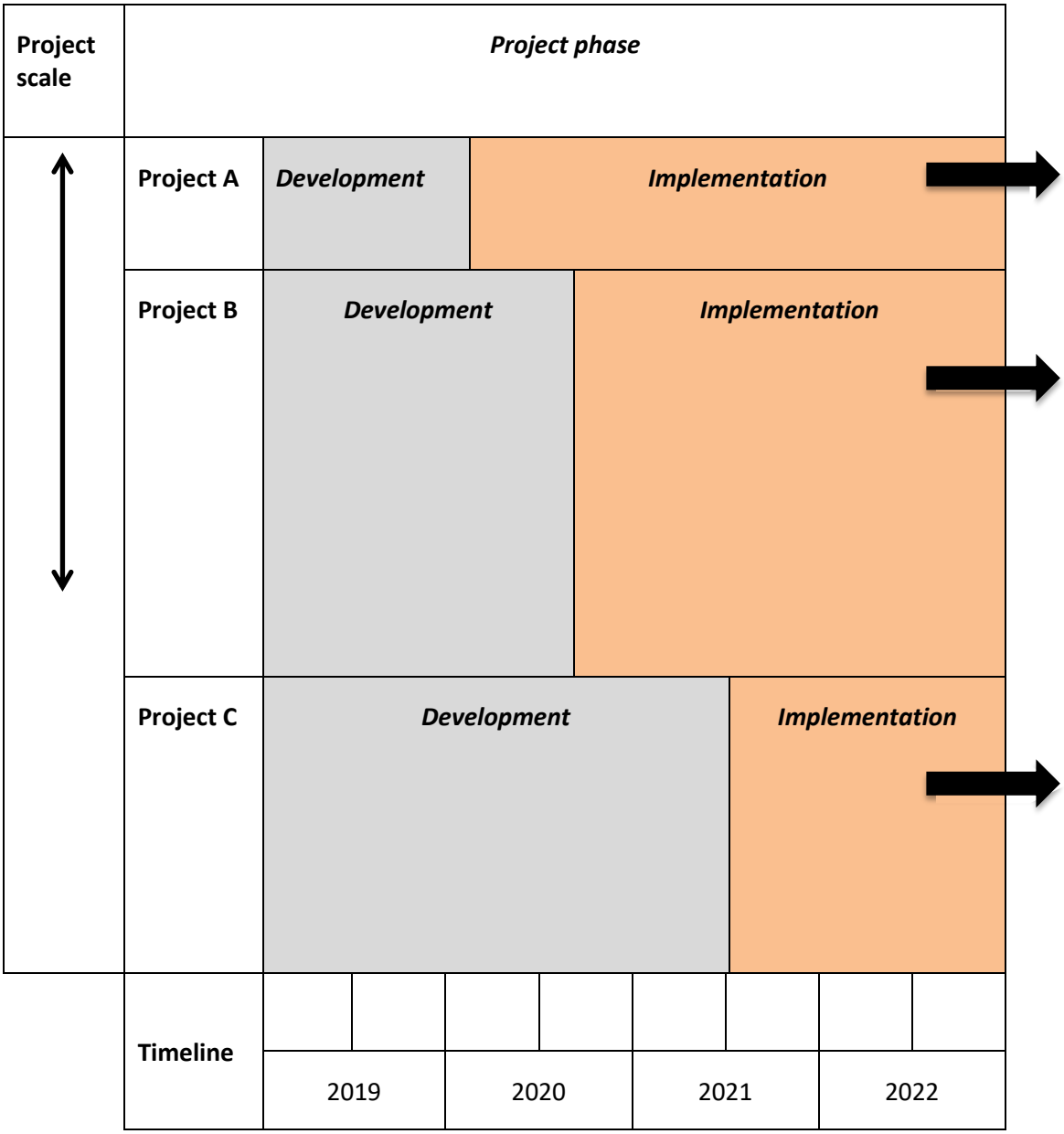
> *Purpose: Intermediate scale impact activity designed to scale (Magiagi customary land).*

*Refer to **Annex 2** for more detailed summary tables for each of the project options.*

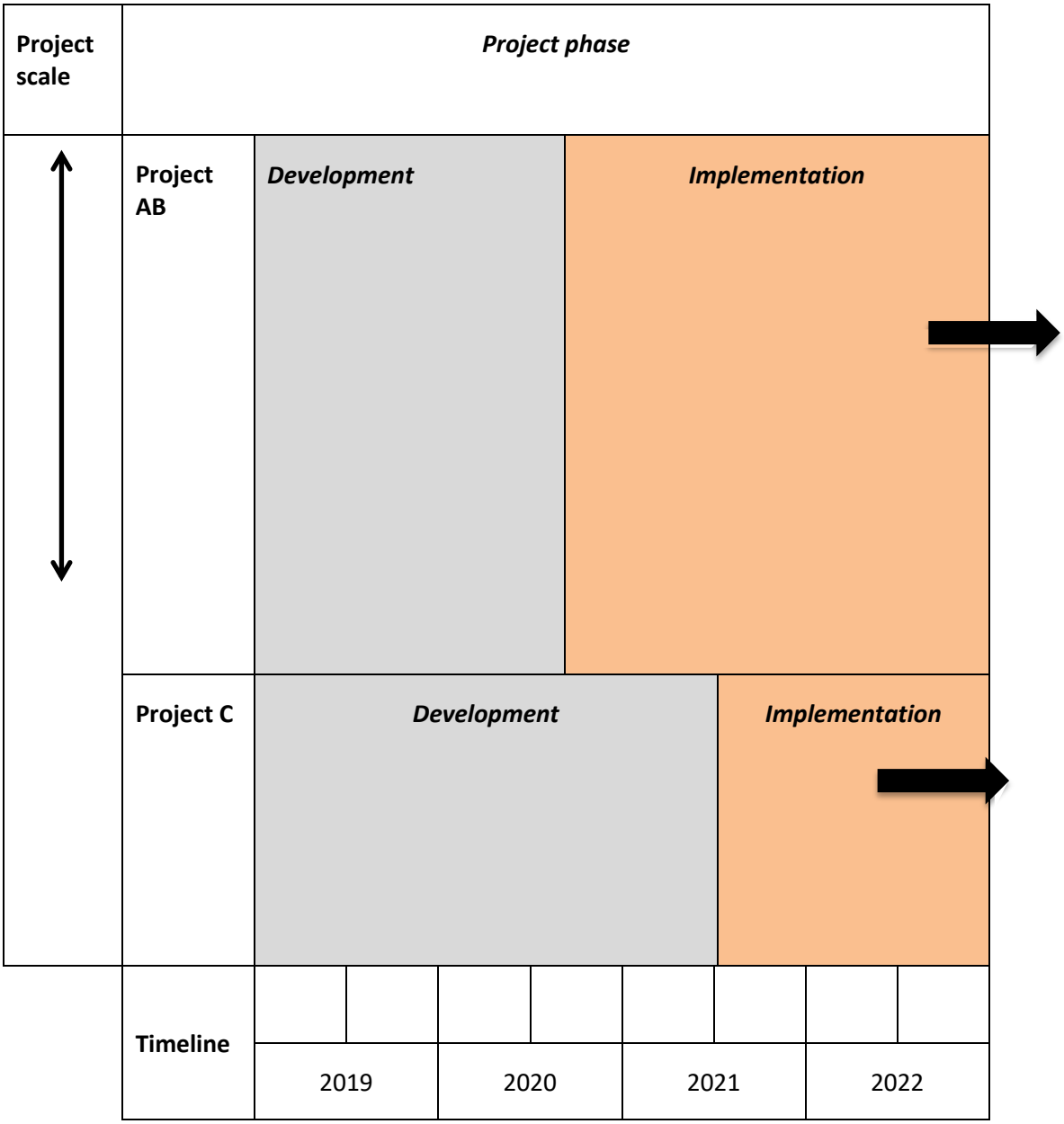
5.2. Programme Options and Indicative Timelines

Estimated project development and implementation guidelines are provided in figure 1 (next page). Option 1 is based on implementing projects A, B & C. Option 2 is based on implementing projects AB and C. *Development stage* includes all the activities that must be completed before a project can be validated and verified by a PES / Carbon certification standard, up until the point that PES units are produced. *Implementation stage* starts at monetisation of PES units and includes maintenance (e.g. forest management) activities, monitoring and reporting activities, and benefit sharing.

Option 1


Project scale
Project phase
Project A
Development
Implementation
Project B
Development
Implementation
Project C
Development
Implementation
Timeline
2019
2020
2021
2022

Option 2 (Recommended)



Recommendation:

- Implement Projects AB and C. Project A could be completed in the shortest timeframe; however, its small scale would mean a large investment in project methodologies and development for small returns and impact. Project A is only recommended if MNRE wish to start with a very small pilot activity.

5.3. VCP Pilot Project Opportunity Costs

Based on field visits, maps provided and discussion, the following significant land uses were observed in the target areas of VRC and greater Apia catchments:

- Sub-division of freehold land for residential housing development (at the relatively 'high' end of the market)
- Mixed cropping (e.g. taro, banana, pawpaw)
- Cattle grazing

PES is highly unlikely to generate benefits capable of compensating for the opportunity cost of sub-division for residential development. Land acquisition by Government at commercial rates is an example of compensation to landowners for forgoing residential development. This has occurred in the catchment, for example in the Government procured 'bio-park,' however acquisition of land at the scale required for watershed protection is likely to be cost prohibitive and takes a long time to implement.

It is more realistic for a PES programme to compensate for opportunity cost for agricultural uses. Opportunity costs per were estimated from Farm Management Manuals provided by the Ministry of Agriculture and Fisheries. For example, the opportunity cost for forgoing cattle grazing was estimated to be USD $33.63 per hectare per annum[15]. The opportunity costs from Farm Management Manuals for banana, cattle and vegetable cropping were used in the financial feasibility analysis for the PES project concepts presented in this report.

Potential non-economic (or non-market) opportunity costs were not examined in the field mission, however the types of non-economic activities for village participants on customary land may be similar to those identified under the Nakau Programme activities undertaken in Fiji, Vanuatu and Solomon Islands. These include access to forest resources for medicinal use, collection of local building materials, hunting, gathering food (e.g. fruit and nuts), and cultural uses, such as maintenance of significant places associated with cultural beliefs, history or customs (e.g. burial places). The volume of forest that can be cleared each year (if any) is dependent on the project activity type (e.g. reforestation, avoided logging, improved forest management), and the rules imposed by the relevant standard. For example, the Nakau Programme improved forest management methodology allows for a *de minimus* logging volume equivalent to 5% of the annual baseline emissions.

Design of PES projects should aim to ensure such activities can continue under a project but are managed in a way that does not impede production of PES outcomes. Indeed, the maintenance of use rights for indigenous custodians can add value to projects, including increasing the value of PES (e.g. carbon offsets) on voluntary markets.

Recommendations:

- PES payments should be sufficient to incentivize or compensate for the opportunity costs of switching from baseline activities (e.g. forest clearance for agriculture) to forest conservation activities.
- Ensure PES projects allow for continued, but managed, customary use of land.

[15] Not including local labour costs. Source: Data supplied in the Farm Management Manual 'Enterprise Budgets for Livestock' and based on gross margin/ha of WS$88.30 (USD$33.89).

5.4. Potential Project Participants and Land Ownership

PES project design must carefully consider and recognise the diversity and complexities of landownership in the VCP and greater Apia catchments. The main candidates for project participant were observed as follows:

- Freehold landowners: Catholic Church (single large landowner) and other freehold landowners of non-residential land (e.g. Andrew Ahliki).
- Government land: Land owned or managed by Government (e.g. MNRE Water Resources Division or Environment Division).
- Customary Land: Land held under Customary title, e.g. Magiagi customary land.

The Nakau Programme uses an assessment tool, adapted from Angelsen et.al (2009)[16], to examine the characteristics of potential project participants in relation to "success factors" (see Annex 2). The success factors were drawn from experiences of community-based conservation and forestry projects from around the world. They can be used to assess the suitability of a particular participant group, or the merits projects that may bring different groups together within a single project.

The factors more likely to contribute to project success include:

- Small to medium sized group (allowing face-to-face interactions).
- Capacity for communication within/between the group – e.g. transport, telephone
- Interdependence (people reliant on one another).
- Homogenous (people belong to a single group).
- Relatively well-off (not extremely poor).
- Group does not experience sudden increases in resource demands (e.g. rapid need for more fuel, housing or money).
- Forests are valued by the group (e.g. culturally).
- Past experience with forest management.
- Participants likely to be motivated by payment incentives (it is something they would normally seek).
- PES payments able to compete favourably with alternative land use value (opportunity costs).

It is not necessary for a project to meet every success factor (above) to be effective. However, an assessment against these factors can help to determine which landowner groups could be clustered within a single project, and also indicate where specific support measures or project interventions need to be implemented.

Recommendation:

- Select and organise project participants through a process that considers 'success factors' derived from examples of similar projects and identifies risks that can be mitigated through project design and implementation.

[16] *Angelsen, A. with Brockhaus, M., Kanninen, M., Sills, E., Sunderlin, W. D. and Wertz-Kanounnikoff, S. (eds) 2009 Realising REDD+: National strategy and policy options. CIFOR, Bogor, Indonesia.*

5.5. Legal Instruments and Forest Protection By-Laws

Addressing deforestation and forest degradation in the VRC and Apia Catchments will likely require a combination of regulatory measures in combination with PES. PES can provide an incentive for adoption and maintain land use change but will be strengthened with legal protection. The Water Resources Management Act 2008 is one option that may be used to protect forest through declaration of watershed management areas and water reserves and easements.

Leasing forested land is another option that could be explored to achieve both forest protection and benefit sharing outcomes. If the option is available, it could work in a similar way to the Nakau / Drawa project example from Fiji. In this example the customary landowners formed a legal entity that could hold the land lease. The lease conditions require that forest is protected and establish the rents that are paid to landowners. The advantage of this mechanism is that the land is not alienated from the landowners and can be leased for the duration of the project (e.g. 30 years). In Fiji customary landowners preferred the lease option to any alternative that would lead to loss of customary rights. In the VCP context several options for leasehold forest protection could be envisaged:

a) MNRE / Samoan Government could lease land from freehold land owners in strategic parts of the catchments (for example Catholic Church land)
b) The Magiagi customary landowners could form a legal entity (e.g. an incorporated association) and lease their land to their association. The association (or other legal entity as appropriate) could be established under a constitution that allows MRNE or NGO representatives to hold non-benefit receiving board positions to increase administrative capacity, or
c) MNRE / Samoan Government could lease land from Magiagi customary landowners

There are trade-offs between the options (b) and (c) in relation to Magaigi land. Option (b) requires a significant investment in customary owners' capacity for governance and management, and hence presents somewhat of a project risk. However, improvements in local capacity (building social capital) could be a significant beneficial outcome from the project for local communities. On the other hand, option (c) would reduce governance and management risks but would not generate the same level of social benefits and may diminish customary owner rights. To manage this trade-off option b) provides an approach where 3rd parties (e.g. government or NGO representatives) augment local governance capacity, while landowner capacity is being built.

Compliance and capacity for enforcement of centralised regulations could be expected to be a challenge in Samoa, as it is in other Pacific Islands countries. FAO has made the general observation that "command and control approaches to protecting the flow of benefits from watershed landscapes have often failed, therefore efforts have recently been made to create markets for these externalities. "[17] Given these experiences, it will be important for decentralised systems, such as customary law (e.g. village by-laws) to be employed and supported. The examples of PES projects implemented by the Nakau Programme in Vanuatu and Fiji provide a potential model for integration with customary laws. In these examples customary law is incorporated into the *conservation management plans* that identify prohibited and allowable activities and establish local penalties and process for dealing with non-compliance. Benefit sharing systems may also need to recognise formal and informal (secondary) land and resource rights, and hence benefit from local design.

[17] *M. Bernoux et.al (2011) Carbon sequestration as an integral part of watershed management strategies to address climate change issues; Policy brief.*
http://www.fao.org/fileadmin/templates/ex_act/pdf/Policy_briefs/Carbon_watershed_management_July_2011.pdf.
Downloaded on: 10th January 2019

A further layer of 'legal protection' of forest can be included in the PES agreement between project participants. PES payments should be 'performance based' or conditional on delivery of outcomes (sometimes referred to as conditionality). To avoid non-delivery of outcomes the PES producer should be paid 'ex-post' (after delivery) rather than 'ex-ante' (before outcomes have been delivered). The PES producer (seller) should ideally sign an agreement that includes penalties for an avoidable 'reversal' (loss of ecosystem service) that a buyer has already paid for (e.g. if land was cleared after a buyer had already paid for its 30-year protection).

Recommendation:

- Undertake an assessment of options and apply an appropriate legal instrument for forest protection to the PES project areas.
- Consider leasing (with conditions) as an option for legal protection for PES areas (leasing provides an option for benefit distribution through payment of rents).
- Enable customary laws to play a role in forest protection on customary land.
- Ensure PES payments are ex-post and performance based.
- Review and include where possible examples of good practice from other countries where available.

5.6. Benefit Sharing Mechanism

The BSM describes the mechanism by which PES outcomes will be monetized and how the benefits will flow to the beneficiaries. These will be primarily financial benefits but may also include employment and investments into community development or livelihood activities that can be financed through PES. An effective benefit sharing mechanism is critical to providing and maintaining an incentive for PES and should ideally compensate for participants opportunity costs.

It can be difficult to guarantee the flow of benefits to producers from PES operating in voluntary markets because sales volumes and prices will vary according to demand from the market. For this reason, it is prudent to secure demand (buyers) for PES (carbon or WMS) at an early stage in the project. There is also merit in the Government of Samoa investing in high-level negotiations with other countries on potential demand for offsets under the Internationally Transferrable Mitigation Outcomes (ITMO) markets under the Paris Agreement, or potentially the CORSIA market (international aviation sector).

As a beneficiary of ecosystem services, the Samoan Government / MNRE could consider undertaking a role as a buyer of PES outcomes either through purchasing of PES units, providing grant and/or debt financing to projects, and/or guaranteeing (underwriting) PES payments to producers. This could be achieved by purchasing any PES units or WMS services that remain unsold at the end of each project year, or through a guarantee of rent payments to landholders (e.g. under lease conditions) to de-risk possible shortfalls should payments be entirely dependent upon PES sales. The objective would be for PES sales to finance 100% of rents owed, but in the event of a shortfall the Samoan Government could finance the 'gap.' While this incurs a potential liability for the Government, it is arguably more cost effective than other options such as land acquisition, as catchment protection will be wholly or partly subsidized through the market. The existing system for payments of rents on land leased for Nonu production may provide an existing model for benefit sharing that could be applied to PES and should also be investigated. A lease / rent approach would be consistent with the VCP UNDP Revised Operational manual for Activity 2.2, which states "The financial sustainability agreements relating to areas registered

under the PESP will be ensured through partnership with MNRE, the landholder and a potential service buyer."

Many alternatives for benefit-sharing mechanisms are possible under PES and should ideally be explored through consultation with participants and stakeholders. The Nakau Programme model provides working examples of benefit distribution systems that operate at community / project scale in Fiji and Vanuatu. Design of the benefit sharing system is recommended as a discrete activity to be implemented in the PES project concepts in this report.

Recommendation:

- Select an appropriate PES Certification Standard that maximizes market access. Forest carbon credits that need to be monetized at scale (e.g. >100,000 credits annually in a project or programme) and in markets like the Australia voluntary offsets market, the Verified Carbon Standard is recommended. For smaller scale projects (e.g. <50,000 credits annually) the Plan Vivo Standard is recommended.
- Engage an international Programme Operator to link to international voluntary markets (assuming international markets are targeted). The Nakau Programme is the only choice in the Pacific at this time, but another option is to develop a programme operator separately.
- The Samoan Government should guarantee (de-risk) PES payments to landowners (e.g. through underwriting projects, providing soft loans, payment of lease rents).
- Design the community level benefit distribution scheme in consultation with beneficiaries and consider other successful Pacific Islands models (e.g. Nonu and Nakau).

5.7. Labour Availability and Costs

Availability and costs of labour for land management and restoration can be a significant limiting factor impacting on PES feasibility, especially for reforestation works. The PES programme in Samoa will require significant labour inputs for reforestation activities and for enhancing existing degraded forests (e.g. weeding). The labour costs will be especially concentrated in the first three years, for example in establishing new plantings (seedling production, site preparation, weeding, planting, fencing). Labour costs will then be decrease significantly after forest establishment during the implementation or 'maintenance' phase, which will continue for up to 30 years.

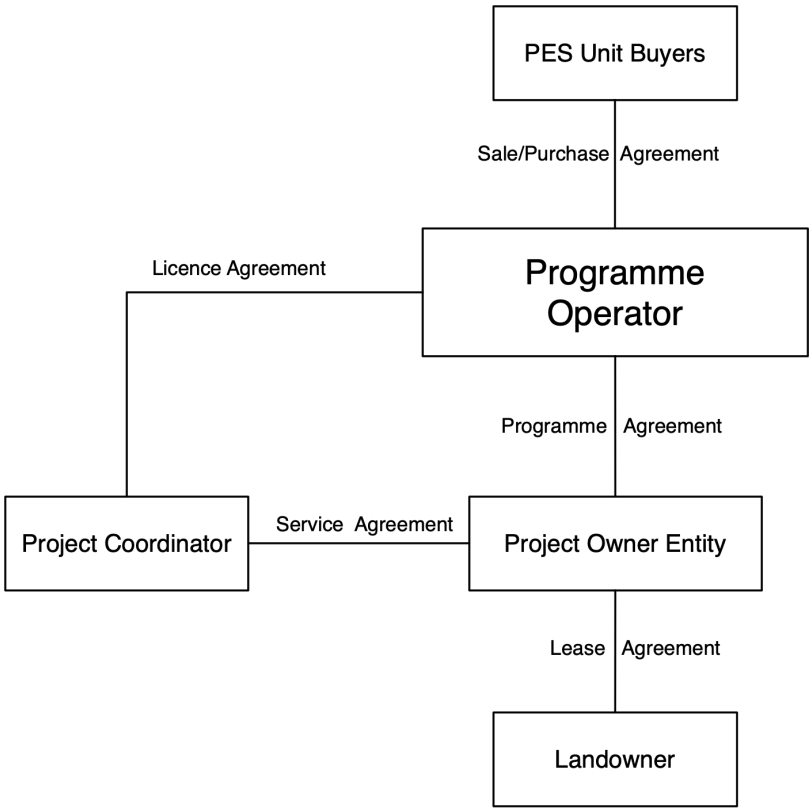
The project concepts designed (in this report) assume that the VCP can cover labour costs for approximately 3 years through CfW but are designed to finance and support ongoing labour inputs through income generated by the sale of PES units. Feedback from stakeholders suggested that labour is available from communities in the catchment, and that 'labour mobility' is not expected to present a major obstacle.

Recommendation:

- Maximise the opportunities for financing local labour through the CfW activity
- Include local employment as a key part of the local benefit sharing mechanism (PES payments used to finance labour).

5.8. Overview of PES Implementation Model

5.8.1. Concept for project legal structure



Rationale:

Key stakeholder relationships need to be supported by contractual arrangements that bind and safeguard those relationships. These safeguards include financial arrangements, key responsibilities and compliance with programme rules and protocols. This is particularly important for quality controls and quality assurance purposes, especially when these need to be streamlined as much as possible.

Programme Operator

The Programme Operator sits at the centre of the structure, functioning as overseer and facilitator of both supply side and demand side activities. The purpose of the Programme Operator is to take responsibility for running the programme in partnership with the MNRE and acting as the MNRE technical agent. This can allow MNRE to support a PES programme without having to have this capability in-house, whilst building capacity to do this through time.

Another key function of the Programme Operator is to de-risk the supply chain of projects by ensuring that activities are disciplined and supported technically (including training and extension support). This includes recruiting only Project Coordinator entities that meet key criteria of transparency, capability, experience, integrity, capacity, durability. Project Coordinators operate in the programme under license to the Programme Operator, where licences can be revoked should the Project Coordinator fail to meet key performance criteria.

Another key function of the Programme Operator is to function as the sales agent for PES units that are aggregated into a single pool. This serves to enable different projects to supply small scale PES unit volumes into a single larger pool sufficient to enable the recruitment of buyers with appetite for larger volumes of PES units (e.g. Airlines). This arrangement also enables sales and marketing effort to be consolidated.

In terms of a potential actual Programme Operator for the VCP, there is an opportunity to explore a partnership arrangement between the Nakau Programme, Ekos, and MNRE.

The Nakau Programme Pty Ltd was established as an independent Programme Operator entity, in order to facilitate the roll-out of local and national PES programmes in the Pacific Islands. It is a company registered under Australian law, and co-owned by two charities: Live and Learn International (Australia based) and Ekos (New Zealand based).

Supply: The Nakau Programme Pty Ltd focuses on supporting project supply chains, particularly through supporting Project Coordinators. This includes:

- Training and educational support for government counterparts, Project Coordinators, Project Owner Entities and Landowners (including design of educational videos in local languages);
- Project and programme coordination and project management.
- Beneficial impact monitoring support for projects.
- Benefit sharing and revenue reinvestment support for projects.
- Project governance support and training.
- Project business management support for Project Owner Entities.
- Government relations support to a programme.
- Financial disbursement of PES revenues to all key stakeholders.

Demand: Ekos focuses on providing technical and financing support elements to enable the integration of supply with demand in PES markets, including:

- PES accounting methodology design and certification.
- Integrating technical and financial elements of programme and project design and implementation.
- Design/development of project and programme investment models.
- Investment acquisition support to maximise the beneficial impact of money.
- PES unit monetisation through marketing and sales in retail and wholesale PES markets.
- Government relations to support programme financing.

These complementary capabilities of the Nakau Programme and Ekos, and their experience in working together in PES project and programme development in the region enable them both to position themselves as a capable and experienced Programme Operator partnership, in partnership with MNRE.

How this could potentially function in practice would need further exploration in dialogue with MNRE. One option would be for the Programme Operator of the VCP PES Programme to have a governing board made up of representatives from MNRE, the Ministry of Finance, SPC/SPREP, with an executive comprised of MNRE, Nakau and Ekos.

Project Coordinator

The Project Coordinator in the Nakau model is a local entity with proven capability, capacity, and integrity that works directly with the Project Owner/landowner. Their role is to assist the Project Owner to establish and manage the project for the duration of the Project Period (e.g. 30 years in a forest carbon project). It is common for a programme to have several Project Coordinator entities that in aggregate drive the programme forward supported by the Programme Operator.

The Project Coordinator operates under license to the Programme Operator and must maintain all quality controls associated with that license. Should the Project Coordinator fail to perform, the project can then be assigned to another Project Coordinator. The point here is to ensure that the Project Owner (landowners) are being properly supported by capable entities that are focused on the task of developing the project.

The Project Coordinator responsibilities include:

- Undertaking all project consultations with landowners to facilitate project decisions.
- Helping to build landowner understanding sufficient to enable decisions based on Free, Prior and Informed Consent (FPIC).
- Help building Project Owner Entity capacity in project governance and project business management.
- Facilitate and coordinate seedling supplies, land preparation, planting, weed and pest control, fencing (if any), survival monitoring, replanting – all activities required to establish the project.
- Coordinate project measurement, reporting and verification (MRV).
- Project management of the project.

Project Owner Entity

The Project Owner Entity is the single legal entity that owns and manages the project on behalf of the beneficial landowners. The role of the Project Owner Entity is to co-manage the project in partnership with the Project Coordinator, and to maintain the project according to the rules set by the Programme Operator.

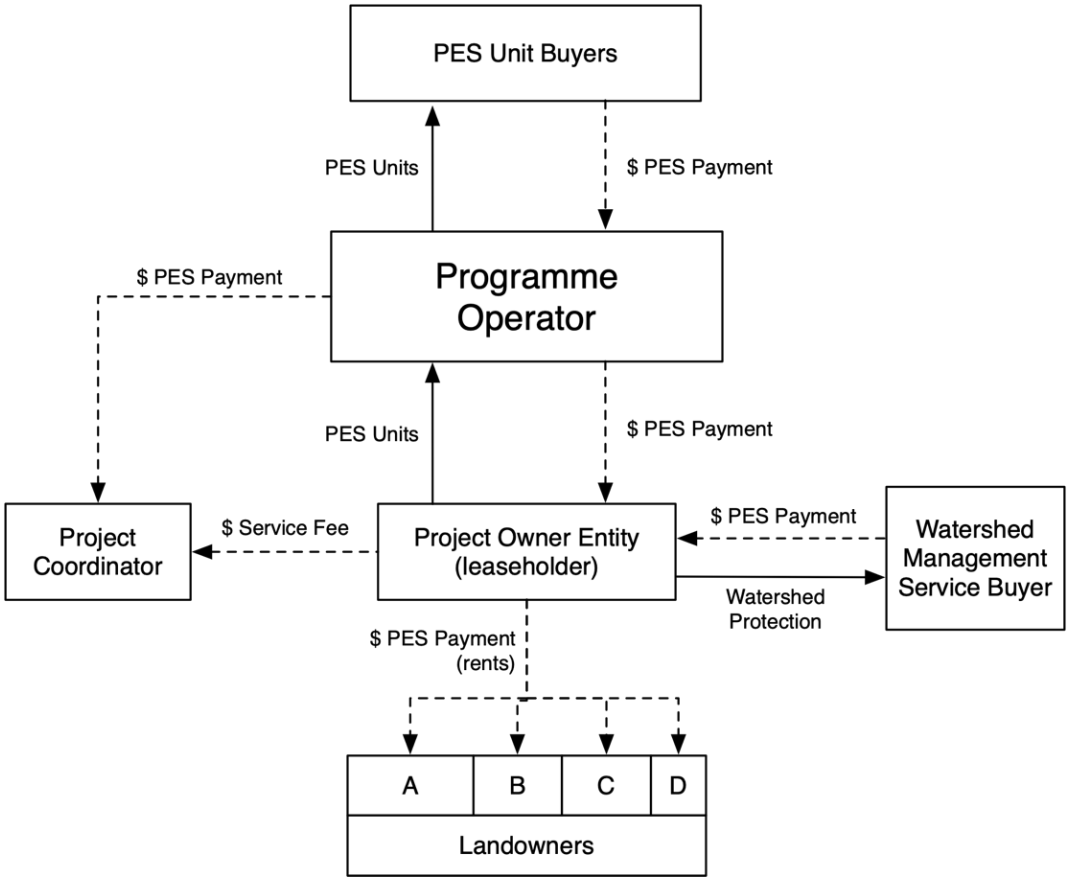
5.8.2. Roles and Responsibilities

Table 6. Project Roles And Responsibilities

Primary Participants			
Role	**Responsibilities**	**Legal Instrument**	**Entity**
Regulator	• Ensure compliance with existing legislation & policies • Provide legal instrument for land protection	• Forest management Act 2011 • Water Resources Management Act 2008 • Other legislation and policy	• MNRE (relevant divisions)
Project Owner	• Holder of PES (e.g. carbon) rights • Owner of PES Unit sale profits (after costs) • Project co-management • Project co-monitoring • Benefit distribution to landowners	• Lease agreement / MOU with landowners • Programme agreement; including supply and sale agreement with Programme Operator • Service Agreement with Project Coordinator	• Projects A, B or AB: Samoan Government / MNRE • Project C: Legal entity with board consisting of customary landowner and MNRE representatives
Project Coordinator	• Service provider • Project design and implementation – e.g. coordinate field activities • Recruit / employ field workers • Supports project governance	• Licence Agreement with Programme Operator • Service agreement with Project Owner	• NGO / business or other entity recruited into the programme. Can be a partnership or consortium between entities

	• Project co-monitoring • Project co-management		• MNRE supports Project Coordinator through various inputs (e.g. CfW)
Programme Operator	• Quality assurance oversight • PES unit sales & marketing agent • PES registry agent • PES unit aggregator (across multiple projects for access to large buyers) • Capacity building and support • Provision of project development & implementation tools, systems, standard operating procedures and methodologies • Policy advice /sector advocacy	• Programme Agreement; including purchase agreement with Project Owner • Sale and purchase agreements with PES unit buyers • Licence Agreement with Project Coordinator	• Entity requires capacity / expertise in supporting local actors, and linking to international actors (e.g. markets)
Project Standards	• Ensure accuracy / integrity of PES assertion • Ensure social and environmental safeguards are met • Issue (create) PES units for the project	• Project validation • Project verification	• Established standard appropriate for target PES objectives and market • E.g. Plan Vivo or VCS
Project Validator & Verifier	Independent assessment and audit of: • Project Description (PD) • Monitoring reports • Includes field inspections	• Validation / verification auditing service agreement with Project Coordinator	• 3rd party service provider as per certification Standard requirements
Project Registry	• PES Unit registry • Issuance of PES Units	• Registry Terms and Conditions	• E.g. Markit registry
PES Unit Buyer	• Purchase PES Units, e.g. carbon credits (pays for outcomes achieved) • Finances ongoing activities	• PES Sale and Purchase Agreements	• Private sector • Government

5.9. Concept for Programme Finance Model



Rationale:

The financial arrangements in a project are central to the successful functioning of the project. The flow of money to the project and its participants will determine the activities undertaken during project development and operation and will also be central to the distribution of benefits to beneficial owners (including any reinvestment of such benefits according to the project benefit sharing plan). The conceptual structure presented above is modelled on how the Nakau Programme operates its projects in Fiji and Vanuatu.

All participants who need to be paid for that participation according to the project design, need to be a party to the project benefit sharing plan and business model. Project establishment uses grant or investment funds (deployed as capital expenditure) to develop the project to the point where PES units (e.g. carbon credits) are being produced and issued in a registry. The flow of that money will be determined according to a Project Development Agreement between the relevant parties (Funder, Programme Operator, Project Coordinator, Project Owner Entity, Landowner/s).

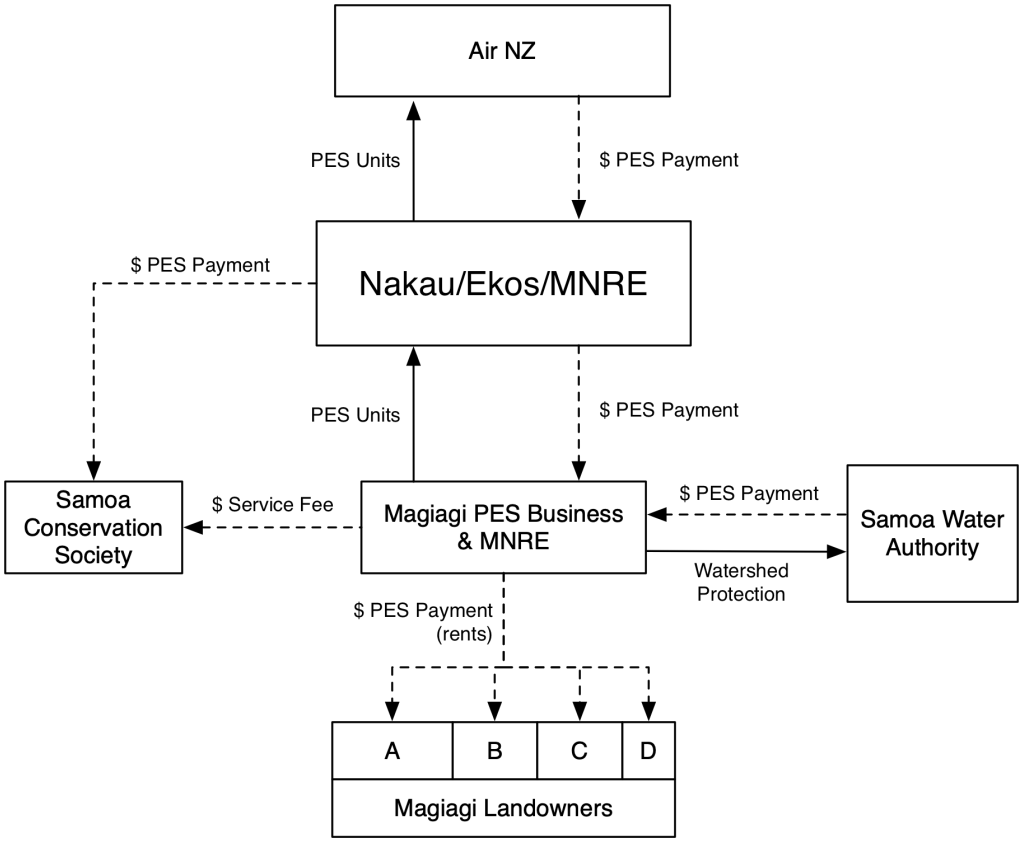
Once the project becomes operational from a PES unit production point of view, it will shift from the capital expenditure budget to the operational expenditure budget, with operational expenditure funded through PES unit sales. The flow of funds from such sales needs to be carefully managed to ensure that these funds actually finance the budgeted activities required by the project in an on-going manner.

The Project Financial Model presented above depicts these financial relationships in the disbursement of PES unit sales revenue through the life of the project. A key position in this financial value chain is the Programme Operator who functions as a revenue gathering entity through PES unit sales, and a revenue disbursement agent through disbursement protocols that fund the activities of key operational entities including the Project Coordinator and the Project Owner Entity.

In some PES models, there may be a dual PES revenue pathway that includes both PES unit sales and/or direct payments from a government entity that participates in the project by making watershed management payments directly to the Project Owner Entity.

Irrespective of the particular mode of financial inflow, what remains fundamental is the disciplined disbursement of funds and the accountability of those disbursements. If money is allocated in a manner that is contrary to the protocols established in the project financial architecture, there is significant risk of project failure – either through conflict between stakeholders, or because the original purpose of project revenues fails to be delivered. This relates to the drivers of unsustainable watershed management needing to be addressed through compensatory payments to address conservation opportunity costs mentioned in section 3.1 and 3.2.

5.9.1. Programme Finance Model – Example Scenario for Magiagi Project

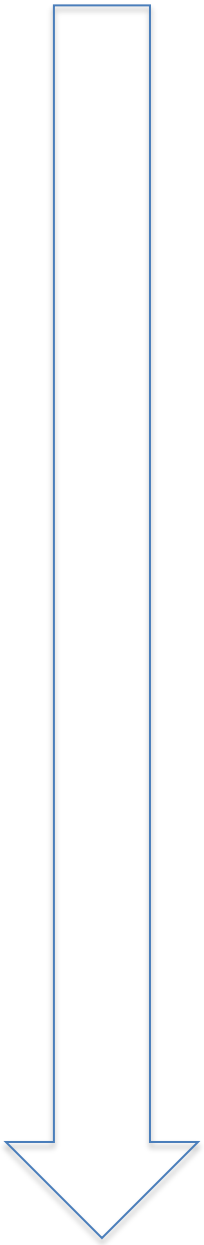


Rationale:

This example presented above shows how a project could be structured for a project at Magiagi using the project financial model architecture presented in section 5.9 above. To enable a project to proceed two entities could be formed: the Programme Operator and the Project Owner Entity. Other participants already exist and could be integrated into the project for purposes of execution in a pilot project.

5.10. Project Development Stages

The stages presented below reflect certification standard requirements for a PES / carbon project. The steps below are drawn from the Plan Vivo process, however other standards (e.g. VCS and Gold Standard) have comparable requirements.



1. **Feasibility assessment** - it is advisable to undertake an assessment of project feasibility prior to a larger investment in project development.

2. **Project Idea Note (PIN)** – a 'light version' of a project design document. It provides an overview of how the project will operate. If Plan Vivo is selected as the preferred Certification Standard, they will assess the PIN and register the project as a 'project in development.'

3. **PES / carbon measurement methodology**. The project will need to select from existing methodologies (if possible) or adapt and develop a new methodology for objectively measuring and reporting the PES outcomes (e.g. volume of carbon sequestered) by the project.

4. **Project Description (PD) Part A.** The PD is the full business model for the project. Part A focuses on governance and management arrangements, including FPIC, participatory planning, benefit sharing and grievance redress etc.

5. **Project Description (PD) Part B.** Part B describes the methodology that will be implemented to monitor, verify and report (MRV) PES outcomes.

6. **Project validation.** Validation refers to the process by which the Project Description is audited and validated to a standard.

7. **Project verification.** Following project implementation, the project produces periodic (e.g. 3-5 yearly) monitoring reports that track project outcome delivery progress. The monitoring reports contain the PES unit assertion for the monitoring period. The monitoring report is audited against the PES standard, and once verified the next batch of PES units are issued by the issuing body (e.g. a PES unit registry.

8. **Sales and monetisation.** Once credits are produced (see verification), they can be sold to private or public sector buyers who seek to offset their emissions or purchase PES / WMS outcomes.

5.11. Participatory Approach

It is recommended that a participatory approach to project development is adopted and employed throughout the various stages of project development and implementation. The level of participation suggested is '*collaboration*,' as defined by the International Association for Public Participation[18] as aiming to "partner with the participants in each aspect of the decision including the development of alternatives and the identification of the preferred solution", with the promise to participants that "we will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible."

In practice this means ongoing engagement with participant groups for each project step, to;

- Enable participants to grant or withhold their free, prior informed consent for key aspects of project design, development and implementation, in particular for decisions that create continuing commitments, responsibilities or have potential for future impacts on local livelihoods and land use.
- Enable participants to develop ownership of and meaningful input into project design, implementation, and management.
- Ensure that representatives of participating groups have a mandate from group members, including people who may be disadvantaged based upon gender, age, income or social status.
- Ensure that the process of undertaking a PES project is transparent, empowering, and community-building for the participants.
- Ensure that costs associated with project development and on-going management are transparently understood and agreed by the participants.
- Ensure that the benefits of any PES project are equitably and transparently distributed between the participants and other parties.
- Ensure that the benefits of any PES project are equitably and transparently distributed within the participant community.
- Ensure that project design, development, implementation and monitoring are undertaken with due adherence to necessary safeguards associated with PES project development as required by the standard/s applied.

[18] *International Association for Public Participation (iap²). Public Participation Spectrum. IAP2 International Federation (2014) https://www.iap2.org.au/Tenant/C0000004/00000001/files/IAP2_Public_Participation_Spectrum.pdf. Downloaded on 10th January 2019.*

5.12. Project Development Activities

The activities recommended for implementing a PES project presented fall into three main categories:

- **'Planning and governance'** activities focus on people, planning, governance and institutions. This includes key areas of education, participatory planning, free prior and informed consent (FPIC), management activities, legal agreements, benefit sharing and grievance redress system.

- **'Technical'** activities focus on measurement and reporting of ecosystem services outcomes, such as forest inventory, carbon measurement and biodiversity assessment (if required).

- **Financing** activities focus on financial feasibility and analytics, market access, and sales and marketing support associated with monetising PES outcomes.

5.12.1. PES Planning and Governance

(i) Pre-feasibility assessment for selected projects. Apply site / participant selection criteria and ensure that social and governance attributes are favourable, and risks can be mitigated. Result: Sites and target groups selected, general PES approach agreed. *NB: this concept paper fulfils most requirements for the pre-feasibility assessment.*

(ii) Develop project proposal (Project Idea Note). In consultation with stakeholders, develop a PIN that describes each project in reasonable detail. Result: PIN submitted.

(iii) Project development agreement. Project participants declare their commitment to project development (at a level similar to an MOU). This is to mitigate the risk of participants engaging in incompatible activities (e.g. land clearing) that would threaten the project during the development phase and safeguard the financial investments in project development. Furthermore, the formal agreement to undertaken PES can provide the project 'start date' and potentially allow back-dating of PES / carbon crediting. Result: Project development agreements signed, project start dates formalised.

(iv) Social impact assessment

Social impact assessment focuses on the target beneficiaries and other groups potentially impacted by project interventions, with particular consideration given to vulnerable and disadvantaged groups. The assessment will use semi-structured interviews to document baseline conditions upon which intended and unintended project impacts can be measured. Refer UNDP's Social and Environmental Standards (SES); link to PUMA Act 2004, MWTI Act 2002. Result: Social impact baseline established, and impacts monitored.

(v) Free, prior and informed consent (FPIC).

A formal FPIC process should be designed and implemented for the project. This is particularly important because PES / carbon projects require a long-term commitment (e.g. 30+ years) for project permanence, which can also introduce long-term liabilities. It is important for participants to be fully aware of any impacts of their participation on their land and resource rights. It is recommended that an FPIC process identify key points in project design, development and implementation that trigger the need for a mandate or decision by participants. Result: Participants provide or withhold their free prior and informed consent for project participation.

(vi) Land use planning

Integrated land use planning for PES should ideally be undertaken within the context of broader, catchment wide planning process. However, it also needs to occur at a 'finer resolution' with landowners focusing on the land areas that will be directly or indirectly impacted by a project. Selection of specific land parcels for PES activities should consider factors including landowner needs and aspirations, population demographics (e.g. population growth), housing, food security, land capability & suitability (e.g. soils, erosion and flood risk). Result: PES areas selected and strategically integrated with other land use activities. Land tenure and boundaries clarified / confirmed where necessary.

(vii) Conservation / land management planning

Project participants (e.g. Magiagi landowners) should be engaged in the process of conservation and land management planning. The plan will include identification management objectives, threats to forest, management zones, management rules or by-laws, management activities (e.g. boundary marketing, weed management), monitoring activities and management roles and responsibilities. The plan should be developed using local knowledge and aim for local implementation using and building upon local capacity. The plan will be the main guide to how landowners manage their land that is protected for PES. Result: Conservation / land management plan completed.

(viii) Design of benefit distribution system (BDS)

The BDS will be designed at a programme level and at community / project owner levels. The Nakau Programme provides an established model for benefit sharing at programme and community levels, which is currently being implemented in Fiji and Vanuatu. The concept presented here (see 4.3 above) recommends replicating this model, however the model can also be adapted to meet local needs, constraints and expectations. Result: PES Benefit distribution system developed, programme agreements signed.

(ix) Design grievance redress system (GRS). The GRS should be designed in consultation with project participants, and where possible should link with existing GRS or dispute resolution systems in Samoa. The Nakau Programme provides a model Standard Operating Procedure (SOP) for GRS, which is based on based on principles of conflict resolution and non-violent communication. Result: SOP for grievance redress system.

(x) Business and financial literacy training

Training would target Magiagi project participants (assuming a Magaigi focused project is implemented). Local trading providers would ideally be engaged if they were available. Business management training can be implemented in conjunction with SBEC Training for communities and beneficiaries and training for small and medium-sized enterprises. Result: Training delivered; increased capacity for sustainable business and PES project permanence.

5.12.2. PES technical activities (project development phase)

(i) PES (MRV) methodology. The methodology refers to the method used to quantify (measure, report and verify) PES or carbon outcomes. Initially, the activity should assess the availability and suitability of existing "off the shelf" methodologies from Certification Standards (e.g. VCS). Suitability should consider factors such as characteristics of the forest and PES activity, carbon pools (if relevant), costs of implementation, data availability and local capacity to generate additional data requirements. The Nakau Programme has developed two Technical Specifications (methodologies) that are validated under the Plan Vivo Standard and could potentially be used or adapted. If required, development of a new methodology should be outsourced to technical specialist in the field. Result: One or more methodologies selected and validated for use in the projects.

(ii) Baseline forest assessment. Forest assessment will involve collection of data as required by the PES methodology (see above). Existing data may be used where suitable and available. Ideally the assessment should be undertaken using existing capacity and standard methodologies (adapted if required) and implemented by MNRE forestry division. Data collection would include field survey (sample plots) combined with remote sensing / GIS as appropriate. The data will be inputted into the methodology (see (i) above) to enable the PES (e.g. carbon stock) enhancements to be quantified. Result: Baseline forest assessment completed.

(iii) Reference level forest assessment. This assessment describes the characteristics (e.g. biomass, carbon stocks etc) of a forest that represents the expected 'end state' of a forest that is assisted to regenerate under a reforestation activity type. The reference level survey methodology will be guided by the PES MRV methodology (see (i) above) and implemented as required. Result: Reference level forest assessment completed.

(iv) Baseline biodiversity assessment & monitoring. Biodiversity assessment is not essential in a PES program but is generally a useful exercise to (a) quantify biodiversity impacts for management purposes, and (b) demonstrate the value of a project and potentially generate a better price market price for PES / Carbon. If included, the biodiversity assessment can be built upon existing work and data, and employ methodologies used by MRNE and existing partners. Birds are indicators of healthy forest; they naturally disperse seeds and restore native forest. This is another potential incentive for the project from tourist thus considered important baseline information for project. Result: Baseline biodiversity assessment and follow up monitoring completed.

(v) Conservation / land management activities. Activities such as tree planting, weeding and fence maintenance will be implemented under the conservation and land management plan (see 4.5.1 (vi), above). It is anticipated that CfW will be a vital mechanism to support labour intensive reforestation activities in relevant project sites, especially during the project development phase. Sustainable financing for workers (e.g. local rangers) could be achieved through PES market finance and incorporated into the benefit distribution mechanism. Result: Land management activities, including planting and tree maintenance, implemented as required.

(vi) Forest monitoring and monitoring reports

Forest monitoring must be undertaken periodically (e.g. annually) and reported to the PES Standard according to the project cycle adopted (e.g. every 3 years). The Certification Standard will audit monitoring reports at a cost to the project, hence it would be inefficient to report annually. Monitoring will be undertaken according to the PES methodology (see (i) above). The monitoring methodology should be designed to maximise use of local capacity, and if possible, include labour sourced from the local community, and hence include a training and capacity building component. Result: PES results (e.g. carbon sequestration) quantified, verified and reported.

5.12.3. PES financing activities (project development phase)

(i) Sales and marketing strategy. The Samoan Government will need to invest in a plan to monetise the PES outcomes produced by the projects. The strategy can identify the various markets available, which may include; a) voluntary domestic market for WMS outcomes comprising downstream beneficiaries; b) WMS compliance market created by imposing levies on particular groups, and / or c) international carbon offset buyers from the private or public sector. The Nakau Programme provides a 'Programme Operator' model that achieves economies of scale by aggregating and marketing carbon credits produced through a range of Pacific Islands projects to international buyers. The Nakau Programme model is offered as an option for the VCP PES programme (see 4.3)

(ii) Communication & visibility. A communication and visibility plan should be designed and implemented to build and maintain a high profile for the projects. This will be important for securing long term financing through the PES markets and is particularly important to private sector buyers seeking to build their reputation for corporate, social and environmental responsibility, or social licence to operate in the region.

6. ANNEXES

6.1. Annex 1: Risk Rating Chart

Likelihood of occurrence	**Consequence (impact)**				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	M	H	E	E	E
Likely	M	H	H	E	E
Possible	L	H	H	E	E
Unlikely	L	L	M	H	E
Rare	L	L	M	H	H

Legend:

Extreme (E): urgent intervention / correction required

High (H): matter requiring ongoing / systematic action to manage

Moderate (M): identify responsibility and actions to address

Low (L): manage by routine policy and procedures.

6.2. Annex 2: Project Participant Assessment Tool

Features of the 'project owner' more likely to contribute to success	**Rating** **Green:** Fully meets criteria **Amber:** Partly meets criteria **Red:** Does not meet criteria N/A: Non -applicable			
	Project A	Project B	Project AB	Project C
Small to medium sized group (allowing face-to-face interactions)				
Capacity for communication within the group – e.g. transport, telephone				
Interdependent (people are reliant on one another)				
Homogenous (people belong to a single group)				
Relatively well-off (not extremely poor)				
No sudden increases in resource demands (e.g. rapid need for more fuel or housing)				
Forests are valued culturally				
Past experience with forest management				
Participants likely to be motivated by payment incentives (it is something they would normally seek)				
PES payments able to compete favourably with alternative land use value (opportunity costs)				

6.3. Annex 2: Project Summaries

Project Summary: Malololelei PES Reforestation Demonstration Activity

Project Location	Malololelei Reserve (Andrew Ahliki) + Government land (including bio-park)
Project Activities	Reforestation through replanting, and weed and animal management (assisted natural regeneration)
Project area (size)	≈40 Ha
Project Owners	MNRE / Andrew Ahliki
Project Coordinator	MNRE
Programme Operator	Nakau Programme (option)
Legal Protection	Government land annexed, declared as Parks or reserves. MOU with Andrew Ahliki.
PES Unit Type	Watershed protection hectares (WPHs) or habitat hectares (HHs) and carbon credits (proxy)
Benefits	Biodiversity enhancement, watershed protection, flood mitigation, reduced impact of extreme weather events
Co-Benefits	Enhanced GHG removals from forest protection and reforestation. Biodiversity protection, improved community governance, community development, improved water quality, climate change resilience through
Validator/verifier	Plan Vivo
Project Period	30 years from project start date
Monitoring	3 yearly from project start date
Project Start Date	1st May 2019
Original condition	Cleared land and highly degraded forest and forest edges, impacted by weeds and grazing
Baseline Activity	Degraded forest; grazing impact
Buffer	25% of PES units
Net watershed protection Hectares	TBC
Net Carbon Credits	TBC

Detailed financial analysis at a first level of due diligence has delivered the following financial performance output for this project:

Summary Output Report

Client: MNRE **Site: Malololelei** **Activity: Reforestation**

						Average Annual Returns to Project			
Area	Trees	Capex Grant	Opex Grant	NPV	IRR	y1-5	y6-15	y16-25	y26-35
ha	planted	$k	$k	$k	%	$k/yr total	$k/yr total	$k/yr total	$k/yr total
40	**40,000**	**$139**	**$37**	**$59**	**12.6%**	**$0.00**	**$6.48**	**$8.74**	**$5.97**
						$/ha/yr	$/ha/yr	$/ha/yr	$/ha/yr
	Total Grant $k: $176					**$0**	**$162**	**$219**	**$149**

Interpretation

This project covers 40 hectares and requires a total grant of $176,000. This grant covers:

- Capital expenditure ($139,000) for project development/establishment, and
- Operating expenditure ($37,000) (i.e. the years when the project is running at a loss and only funds the shortfall).

Under the grant conditions and based on assumptions used, the project would generate an internal rate of return of 12.6%. The returns comprise surplus revenue after all project costs have been covered. MNRE as capital provider could justify participating in these returns, and in this way get a source of income that it could use to fund additional projects in the future. It may also be appropriate for the landowner to participate in these returns (e.g. a 50:50 split between the landowner and MNRE).

Project Summary: Apia Catchment Reserve Project

Project Location	Private (freehold) land in Apia catchments (including Gasegase / Vaisigano river catchments) with Catholic land the primary focus
Project Activities	Forest protection (forest remaining as forest) and reforestation (replanting and assisted natural regeneration)
Project area (size)	≈400 ha (200 forest protection, 200 reforestation)
Project Owners	Freehold land owners / Catholic church
Project Coordinator	NGO / consortium – recruited through tender process
Programme Operator	Nakau Programme (option)
Legal Protection	Option (a): Leased by Government for watershed management purpose / conservation. Option (b) annexed, declared as a park or reserve
PES Unit Type	Watershed protection hectares (WPHs) and Carbon (proxy)
Benefits	Watershed protection, flood mitigation, reduced impact of extreme weather events
Co-Benefits	Enhanced GHG removals from forest protection and reforestation. Biodiversity protection, improved community governance, community development, improved water quality, climate change resilience through
Validator/verifier	VCS (TBC)
Project Period	30 years from project start date
Monitoring	3 yearly from project start date
Project Start Date	1st July 2019
Original condition	Forest land in varying condition; some areas cleared and degraded
Baseline Activity	Degraded forest; grazing impact, market gardening
Buffer	25% of PES units
Net watershed protection Hectares	TBC
Net Carbon Credits	TBC

Detailed financial analysis at a first level of due diligence has delivered the following financial performance output for this project:

Summary Output Report

Client: MNRE **Site: Apia Catchment 1a** **Activity: Reforestation**

						Average Annual Returns to Project			
Area	Trees	Capex Grant	Opex Grant	NPV	IRR	y1-5	y6-15	y16-25	y26-35
ha	planted	$k	$k	$k	%	$k/yr total	$k/yr total	$k/yr total	$k/yr total
200	**200,000**	**285**	**$288**	**$242**	**9.5%**	**($57.50)**	**$35.74**	**$46.96**	**$33.12**
						$/ha/yr	$/ha/yr	$/ha/yr	$/ha/yr
	Total Grant $k: $572					**($288)**	**$179**	**$235**	**$166**

Summary Output Report

Client: MNRE **Site: Apia Catchment 1b** **Activity: Forest protection**

						Average Annual Returns to Project			
Area	Trees	Capex Grant	Opex Grant	NPV	IRR	y1-5	y6-15	y16-25	y26-35
ha	planted	$k	$k	$k	%	$k/yr total	$k/yr total	$k/yr total	$k/yr total
200	**-**	**$140**	**$68**	**$41**	**6.4%**	**$0.00**	**$0.00**	**$6.79**	**$17.19**
						$/ha/yr	$/ha/yr	$/ha/yr	$/ha/yr
	Total Grant $k: $208					**$0**	**$0**	**$34**	**$86**

Interpretation

This project covers 400 hectares and requires a total grant of $780,000. This project is split into two parts:

1. 200ha of reforestation
2. 200ha of forest protection

Each sub-project is treated separately in the analysis below.

The grant for the reforestation sub-project (Apia Catchment 1a) covers:

- Capital expenditure ($285,000) for project development/establishment, and
- Operating expenditure ($288,000) (i.e. the years when the project is running at a loss and only funds the shortfall).

Under the grant conditions and based on assumptions used, this sub-project would generate an internal rate of return of 9.5%. The returns comprise surplus revenue after all project costs have been covered. MNRE as capital provider could justify participating in these returns, and in this way get a source of income that it could use to fund additional projects in the future. It may also be appropriate for the landowner to participate in these returns (e.g. a 50:50 split between the landowner and MNRE).

The grant for the forest protection sub-project (Apia Catchment 1b) covers:

- Capital expenditure ($140,000) for project development/establishment, and
- Operating expenditure ($68,000) (i.e. the years when the project is running at a loss and only funds the shortfall).

Under the grant conditions and based on assumptions used, this sub-project would generate an internal rate of return of 6.4%. The returns comprise surplus revenue after all project costs have been covered. MNRE as capital provider could justify participating in these returns, and in this way get a source of income that it could use to fund additional projects in the future. It may also be appropriate for the landowner to participate in these returns (e.g. a 50:50 split between the landowner and MNRE).

Project summary: Magiagi Forest Conservation and Rehabilitation Project

Project Location	Magiagi customary land
Project Activities	Forest protection (forest remaining as forest) and reforestation (replanting and assisted natural regeneration)
Project area (size)	≈50 Ha (25 Ha forest protection, 25 Ha reforestation)
Project Owners (Land owners)	Magiagi customary landowners
Project Coordinator	NGO / consortium – recruited through tender process
Programme Operator	Nakau Programme (Option)
Legal Protection	Conservation Lease: Leased by a legal entity owned by Magiagi landowners (but where MNRE has representation on the board)
PES Unit Type	Watershed protection hectares (WPHs) and Carbon (proxy)
Benefits	Watershed protection, flood mitigation, reduced impact of extreme weather events
Co-Benefits	Enhanced GHG removals from forest protection and reforestation. Biodiversity protection, improved community governance, community development, improved water quality, climate change resilience through
Validator/verifier	VCS
Project Period	30 years from project start date
Monitoring	3 yearly from project start date
Project Start Date	1st May 2019
Original condition	Forest land in varying condition; some areas cleared and degraded
Baseline Activity	Degraded forest; grazing impact, market gardening
Project Activity	Forest protection (forest remaining as forest), reforestation (replanting and assisted natural regeneration)
Buffer	25% of PES units
Net Carbon Credits	TBC
Net watershed protection Hectares	TBC

Detailed financial analysis at a first level of due diligence has delivered the following financial performance output for this project:

Summary Output Report

Client: MNRE **Site: Magiagi** **Activity: Reforestation**

						Average Annual Returns to Project			
Area	Trees	Capex Grant	Opex Grant	NPV	IRR	y1-5	y6-15	y16-25	y26-35
ha	planted	$k	$k	$k	%	$k/yr total	$k/yr total	$k/yr total	$k/yr total
50	**50,000**	**$156**	**$45**	**$77**	**13.0%**	**$0.00**	**$8.31**	**$11.13**	**$7.67**
						$/ha/yr	$/ha/yr	$/ha/yr	$/ha/yr
	Total Grant $k:	**$200**				**$0**	**$166**	**$223**	**$153**

Interpretation

This project covers 50 hectares and requires a total grant of $200,000. This grant covers:

- Capital expenditure ($155,000) for project development/establishment, and

- Operating expenditure ($45,000) (i.e. the years when the project is running at a loss and only funds the shortfall).

Under the grant conditions and based on assumptions used, the project would generate an internal rate of return of 13.0%. The returns comprise surplus revenue after all project costs have been covered. MNRE as capital provider could justify participating in these returns, and in this way get a source of income that it could use to fund additional projects in the future. It may also be appropriate for the landowner to participate in these returns (e.g. a 50:50 split between the landowner and MNRE).