ADAPTATION FUND

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Adaptation Fund Board
Ethics and Finance Committee
Thirtieth Meeting
Bonn, Germany, 11-12 October 2022

Agenda Item: 5 d)

INFORMATION UPDATE ON PHASE 2 OF THE EX POST PROJECT SUSTAINABILITY EVALUATIONS

TECHNICAL EVALUATION REFERENCE GROUP OF THE ADAPTATION FUND (AF-TERG)

Background

1. At the twenty-eighth meeting (October 2016), the Adaptation Fund Board (the Board) decided to request the secretariat to:

> *[….]*
> *Propose, at the twentieth meeting of the PPRC, options for how post-implementation learning and impact evaluation could be arranged for Adaptation Fund projects and programmes, taking into account ongoing discussions on the evaluation function of the Adaptation Fund, as well as Phase II of the evaluation.*
>
> (Decision B.28/32, October 2016)

2. Pursuant to the Board Decision B.28/32, the secretariat developed a document (AFB/PPRC.20/30), which presented three options for how ex post evaluations of Adaptation Fund projects and programmes could be arranged. The three options presented in the document were as follows:

> *I. The Evaluation Function of the Adaptation Fund would conduct the ex post assessments.*
>
> *II. The ex post evaluation would be conducted by independent evaluators but selected by the Implementing Entity (IE).*
>
> *III. An external third party selected by the Adaptation Fund could perform the ex post evaluation.*

3. With consideration to the Board decision to approve the option of re-establishing a long-term evaluation function for the Fund through a Technical Evaluation Reference Group (AF-TERG) (Decision B.30/38), and to the comments and recommendations of the Project and Programme Review Committee (PPRC), the Board decided:

> *a) To convey the assessment of the two options to the Technical Evaluation Reference Group of the Adaptation Fund (AF-TERG), once it is operational, which will subsequently report to the Board on its preferred option; and*
>
> *b) To request the AF-TERG to take into account the above discussion in the PPRC.*
>
> (Decision B.31/24, March 2018)

4. The Board approved the Strategy and Work Programme document (AFB/EFC.26.a-26.b/3)[1] of the AF-TERG between the first and second parts of the thirty-fifth meeting (Decision

[1] Available at: https://www.adaptation-fund.org/document/strategy-and-work-programme-of-the-adaptation-fund-technical-evaluation-reference-group-af-terg-2/

B.35.a-35.b/29), which includes ex post evaluations during the indicative three-year evaluation work programme.[2]

5. The AF-TERG provided the Ethics and Finance Committee (EFC) with a progress update on ex post evaluations at its twenty-eighth meeting (AFB/EFC.28/Inf.4)[3] in October 2021 and at its twenty-ninth meeting (AFB/EFC.29/Inf.4) in March 2022, to update the Board on ex post evaluation progress and future piloting.

Introduction

6. This document aims to update the Board on progress for the ex post evaluation work implemented by the AF-TERG. It outlines the findings of the first two ex post evaluation pilots, after completion of fieldwork, and highlights lessons for the Adaptation Fund (the Fund) and its implementers. The document also describes the next steps for AF-TERG ex post evaluations based on lessons learned from the first two pilots.

7. The AF-TERG work on ex post follows a multiphase process, including:

- Phase 1 – Methodology (completed): to develop a framework for ex post evaluations and a shortlist of up to five completed projects as pilots for ex post evaluation.

- Phase 2 – Piloting (ongoing): to train evaluators and main project stakeholders on methods, and test guidance and methods from Phase 1 in at least two pilots.

- Phase 3 – Implementation and Learning (planned): to continue ex post evaluations over time, informing approaches, methods, and systems within the Fund.

8. The three phases built on AF-TERG foundational work (Phase 0) implemented in FY20: an ex post evaluation study and an evaluability assessment of the Fund's portfolio, whose findings were summarized in document AFB/EFC.26.b/Inf.2.

9. Following a selection process described in Annex 1. AFB/EFC.28/Inf.4, the AF-TERG decided to pilot its first ex post evaluations on the following two projects:[4]

- *"Enhancing resilience of coastal communities to climate change"* (WSM/MIE/Multi/2011/1/PD), implemented in Samoa by the United Nations Development Programme (UNDP) from 2013 to 2018. The project objective was to strengthen the ability of Samoan communities and public services to make informed decisions and manage likely climate change-driven pressures in a proactive,

[2] The original Terms of Reference (ToR) for ex post evaluations provide more details on the background for the ex post work and can be found in the Phase one report for ex post project sustainability evaluation. This report is available on the AF-TERG website at: https://www.adaptation-fund.org/about/evaluation/publications/evaluations-and-studies/ex-post-evaluations/ .
[3] Available at: https://www.adaptation-fund.org/document/progress-update-on-ex-post-evaluations-af-terg/
[4] The two projects were selected from a pool of 17 completed projects with a final evaluation.

integrated, and strategic manner. The project primarily focused on improving infrastructure in coastal communities, but it also assisted districts with coastal infrastructure management planning.

- *"Enhancing resilience of communities to the adverse effects of climate change on food security, in Pichincha Province and the Jubones River Basin"* (ECU/MIE/Food/2010/1), implemented by the World Food Programme (WFP) in Ecuador from 2011 to 2018. This project focused on food-insecure and vulnerable communities in two locations in Ecuador. It aimed to secure community access to water and involve residents in determining what types of infrastructure would be best to protect them from water-related climate impacts. The project was also intended as a model for replication in other water-stressed areas of Ecuador.

10. Both ex post evaluation pilots aimed to test methods and evaluate the sustainability of the project and the ultimate aim of resilience by answering the following questions:

- Have the project outcomes/impact(s) been sustained since project completion?
- How are the sustained project outcomes/impact(s) climate-resilient?

11. Phase 2 of the ex post work was divided into several stages: initial engagement with the Implementing Entity (IE) and evaluator; preparation of training materials; training with evaluator and in-country counterparts on ex post evaluation methods; a co-creation process with country stakeholders (including IEs) to choose outcomes to evaluate; fieldwork; and production of the ex post evaluation report.

12. The AF-TERG recruited in-country evaluators to conduct the evaluation pilots. Based on recommendations provided by the contacted IEs, and following a competitive process, Ms. Karen Komiti and Ms. Monica Ribadeneira Sarmiento were hired to conduct the ex post evaluations in Samoa and Ecuador, respectively.

13. The evaluative fieldwork was conducted between November 2021 and January 2022 in Samoa, and between May and June 2022 in Ecuador. The time gap between both evaluations enabled the team to draw preliminary lessons on processes from the first pilot and adjust its methodological approach for the second evaluation. Both fieldworks provided valuable lessons that will help shape future ex post evaluations.

14. The first two pilots focused on a limited number of outcomes of the evaluated projects. They did not look at the projects in their entirety, given the timeframe and budget of ex post evaluations[5]. In Samoa, the evaluation covered seven project infrastructures designed to protect against flooding, storm surges, and coastal erosion. In Ecuador, the evaluation covered different

[5] As they are envisioned and budgeted, ex post evaluations do not intend to evaluate projects in their entirety but rather a selection of outcomes. Looking at projects in their entirety would require significantly more resources and investments of both time and money. Which outcomes are evaluated depends on a series of criteria, including data availability and stakeholder priorities emerging from the co-creation process.

types of water infrastructure (reservoirs and piped irrigation) designed to secure water during the dry season, as well as homestead gardens and orchards designed to improve food security for targeted families.[6] All assets were assessed with regards to sustainability and resilience to climate change.

Phase 2: Key Findings for the Adaptation Fund and implementers

a) On programming, sustainability of project outcomes and resilience

15. Both ex post evaluations yielded important lessons. In Samoa, all seven structures evaluated addressed vulnerabilities and enhanced the adaptive capacities of communities regarding shoreline (coastal) and flood (wetland) hazards. Climate and natural events will, however, continue with progressive severity. The evaluation has shown that communities are still vulnerable to multiple hazards.

16. In Ecuador, part of the water infrastructure in one site had not recovered from a climate shock and became redundant in a city that was mostly emptied by outmigration following the economic impact of the COVID-19 pandemic. Conversely, in another site, a water infrastructure highly valued by the community had correctly addressed vulnerabilities to drought. Orchards and homestead gardens did not seem to address food security vulnerabilities sufficiently in the two sites evaluated.

17. In Ecuador, communities had maintained water reservoirs and piping. Water infrastructures seem to be more valued than homestead gardens, or their crop/vegetable selection; in at least one site, properties and lands had been abandoned. In many instances in the sites visited, interventions were not sufficient to keep people in their communities.[7] In Samoa, sustainability practices for maintenance of walls and roads were diverse. Most structures were adequately maintained at household, village, and government levels, but some showed signs of deterioration and no signs of maintenance.

18. In Samoa, one infrastructure was claimed to have accelerated sand erosion on adjacent beaches, despite providing adequate coastal protection for surrounding environments. This could highlight problems of maladaptation. No instances of maladaptation were found in Ecuador.

19. Few resilience characteristics manifested in Samoa and even fewer in Ecuador based on the resilience analysis framework described in Annex III. Fieldwork sites in both countries relied on a combination of active and passive resistance (along the resistance-resilience-transformation typology). However, the wider natural and human systems influencing results, and other outcomes, were not evaluated. Therefore, sweeping conclusions are difficult to draw.

[6] Findings from the ex post evaluations cannot be generalized. Both pilots, however, provided important lessons for the Fund and the wider field of climate change.

[7] The project in Ecuador sought to contribute in part to the reduction of local migration rates by improving family incomes through the economic benefits of the intervention.

20. In a major difference between both pilots, sites evaluated in Ecuador experienced a much greater shock than those in Samoa. In Ecuador, several droughts and a landslide occurred between the end of the project and the ex post evaluation. Moreover, the COVID-19 pandemic had severely affected both field sites. In Samoa, climatic stresses were recorded after project completion, but no large climatic shock has occurred. This could explain why the overall sustainability of assets was moderate in Ecuador and why they only exhibited limited resilience to climate characteristics.

21. In general, more solid conclusions could be drawn from Samoa than Ecuador, where only two of 240 possible sites were evaluated. Further, the small respondent pool in Samoa (25 total in two islands) came from purposeful geographic sampling. Conversely, the pool interviewed in Ecuador (18 people in two sites in the Jubones River Basin) was limited by lack of participant data from the project and difficulties in locating key informants during fieldwork.

22. More specific and detailed findings of the fieldwork are available in Annex I (Samoa) and Annex II (Ecuador) of this document.

b) On the feasibility of ex post evaluations and evaluability of projects

23. Both the review of completed projects for ex post evaluation pilot selection and the fieldwork enabled the AF-TERG to draw lessons on processes to inform future evaluations, EP guidance, and further monitoring, evaluation and learning processes at the Fund level.

24. The pool of eligible projects for ex post evaluation pilots was limited to projects that had (a) been administratively completed for 3–5 years at the time of selection; and (b) undertaken a final evaluation. These criteria yielded a pool of 17 eligible projects, which were among the earliest supported by the Fund. Most of them lacked certain features that would support robust ex post evaluation, such as well-developed theories of change (ToCs) and outcome-level indicators and indicator data.[8] As a result, the ex post evaluation team opted to evaluate project results linked to physical assets. When compared to other anticipated project results, such as capacity strengthening,[9] significantly more data were available for assets, albeit at the output level. In both projects, capacity strengthening was not evaluated because of the lack of monitoring of skills acquisition or knowledge change during project implementation.

Phase 2: Lessons for Project Design and Implementation

25. The AF-TERG has developed and tested innovative methods for an emerging field of ex post evaluation. With regards to Adaptation Fund projects, these findings are relevant to project

[8] The ex post industry standard requires evaluation of data at outcome and impact level, rather than output level. This enables assessment of high-level long-term effects and change, especially for climate-adaptation where results can take 3–5 years to materialize. Outputs are normally not evaluated, as they are preconditions for results. Data available in the Fund archives, IE records, and in the field fell short of the complete data needs of an ex post.

[9] Ex post evaluations focus on evaluating assets and/or capacities.

cycle management and are also informing the development of guidance related to the Evaluation Policy. Moreover, its lessons could also benefit a wide range of organizations beyond the Adaptation Fund, particularly given the need for rapid knowledge about investments in adaptation and resilience. Ex post evaluations contribute to learning on climate change interventions and, more generally, to the field of evaluation.

26. Lesson 1: The findings of the ex post pilot evaluations indicate that data quality is important in determining a project's ultimate sustainability and resilience. The design of climate change adaptation projects should include a robust ToC, as well as gender-differentiated indicators and targets at the outcome level. These features have the added benefit of supporting improved project monitoring and management.

27. Lesson 2: The findings indicate that data management and archiving are essential to a robust ex post evaluation. Project design and the initial monitoring and evaluation (M&E) plan in the funding proposal should specify arrangements for data management and archiving. During project implementation, records on capacity baselines and post-intervention levels should be maintained. All project documentation should be archived in an accessible location for several years following the administrative closure.

28. Lesson 3: Ex post evaluations found that it was extremely important to consider the context and climate risks in project design and implementation, and that projects should attempt to understand the full severity of potential impacts. In Ecuador, the impacts or occurrence of climate events such as landslides were more severe than anticipated, which reduced the resilience of assets. Similarly, instances of maladaptation in Samoa showed that project managers should consider such risks when designing projects and evaluating them during implementation.

29. Lesson 4: Projects that provide physical assets and/or infrastructure should develop clear and detailed plans for the transfer of those facilities and their operation, management, and maintenance with sufficient lead time to finalize and support these plans. Both projects showed that some assets were not maintained, or that some stakeholders did not have the capacity to maintain them.

Phase 2: Lessons for Project Evaluation

30. Lesson 5: The methodology and field methods for ex post evaluation should reflect data availability, sample size, and local capacity. Experiences during the pilots led to adjustments of methods both before the fieldwork and between pilots. For example, the evaluators used qualitative methods (Key Informant Interviews, some Focus Group Discussions, and transect walks) to conduct the evaluation, shifting away from mixed methods. This change reflected three factors:

- *Data availability* – Without quantitative (or any) data collected at outcome level during the lifespan of the project, the team used qualitative methods to understand higher-level results. Since evaluations did not assess at the outcome level and there were no indicators at that level either, the team recreated outcomes and a ToC to collect data retrospectively.

- *Small samples* – Because of the design of project sites (only four in Samoa, and two of 240 in Ecuador), data could only be collected on small samples. Furthermore, small sample sizes made it difficult to draw conclusions about gender-differentiated effects of the projects.

- *Evaluators' expertise* – Because national evaluators were only familiar with some methods, qualitative methods were favoured to fit their expertise.

Methods for the ex post evaluation of Fund project will continue to be adjusted over time. In the short term, adjustments will focus on how to evaluate the resilience of assets and capacities given challenges with data quality and availability in older projects.

31. Lesson 6: Training for evaluators should be streamlined. The training provided to evaluators on ex post evaluation concepts and methods before the fieldwork proved to be essential but overly ambitious and time-intensive. Extensive support was still needed throughout the fieldwork and subsequent analysis. Additional field support may be needed to shorten the duration of field work. The AF-TERG will explore options to provide time-efficient support to evaluators in the field. The ex post team will also try to streamline the intensive training, including the translation of all training materials into the relevant language and re-enforce certain aspects of fieldwork, such as the verification of estimated sustainability and gender-sensitive approaches. Finally, time will also be allocated to pilot tools and methods in a test site before the evaluative work.

32. Lesson 7: The ex post evaluation was designed as a co-creative and collaborative process that reflects the priorities of IEs and participating countries, and allows ample engagement of project stakeholders. In practice, this proved to be complex/difficult, given the lack of available data and the time constraints of IEs. Both pilots showed tension between what the IE wanted to look at, what the AF-TERG wanted to learn (or considered feasible to evaluate within its range of methods), and interest and priorities stakeholders brought to the process. The ex post team is focusing on how to increase the engagement of project stakeholders and to communicate and learn from the evaluation findings.

Next steps

33. Over the next few months, and in consultation with the Fund's secretariat, the AF-TERG will address how to communicate findings and lessons from the evaluations with Fund stakeholders. A variety of stakeholders can benefit from the findings, including the Fund Board

Secretariat, IEs, government partners, and front-line communities. The AF-TERG is aware that these diverse groups of stakeholders will require different knowledge products.

34. The AF-TERG will also strive to make the revised training and methodological tools available for wider use, both by Fund stakeholders and others in the broader climate change adaptation community, in an effort to support learning from adaptation actions as stated under Article 7 of the Paris Agreement. The AF-TERG will also be prepared to refine tools to support reporting under the Global Goal on Adaptation.

35. At the same time, the AF-TERG will take steps to move from the pilot phase of ex post evaluation to a standard set of procedures for selecting and implementing ex post evaluations, including protocols for engaging with in-country partners and for communicating results. The AF-TERG will also continue to refine the methodology for ex post evaluations. Furthermore, it will discuss potential approaches for evaluations of fragile states, while ensuring the safety of all participants. Fragile states comprise a significant share of the current eligible pool of completed projects.

Annex I. EX POST EVALUATION (SAMOA)

"Enhancing Resilience of Samoa's Coastal Communities to Climate Change"

Ex post evaluation summary

Structure protecting houses and road from the sea funded by the Adaptation Fund.
Vaiala, Samoa, 2022

Technical Evaluation Reference Group
ADAPTATION FUND

Project General Information

AF Project ID	WSM/MIE/Multi/2011/1/PD	
Country	Samoa	
Project Title	**Enhancing Resilience of Samoa's Coastal Communities to Climate Change**	
Intervention Area	139 villages in 25 districts, including infrastructure investments for a subset of those villages	
Implementing Entity	**Type**: Multilateral Agency (MIE) **Name**: United Nations Development Programme (UNDP)	
Executing Entity	Ministry of Natural Resources and Environment (MNRE)	
Budget (USD)	US$ 8,732,351	
Start date	28 January 2013	
Completion date	June 2018	
Years	Five years	
Sector	Multi-sector project	
Overall Goal	Reduce vulnerability to the adverse impacts of climate change and respond to the impacts of climate change, including variability at local and national levels through (i) reduced exposure at national level to climate-related hazards; (ii) strengthening institutional capacity to reduce risks associated with climate-induced economic losses; (iii) strengthening awareness and ownership of adaptation and climate risk reduction processes at local level; and (iv) increasing adaptive capacity within the relevant development and natural resources sectors.	
Project Components and Outcomes	**Component 1:** Community-engagement in coastal vulnerability assessment, adaptation planning, and awareness	Outcome 1: Strengthened awareness and ownership of coastal adaptation and climate risk reduction at community and national levels in 25 districts and 139 villages.
	Component 2: Integrated community-based coastal adaptation and disaster risk management measures[10]	Outcome 2: Increased adaptive capacity of coastal communities to adapt to coastal hazards and risks induced by climate change in 25 districts and 139 villages.
	Component 3: Institutional strengthening to support climate-resilient coastal management policy frameworks	Outcome 3: Strengthened institutional capacity of government sectors to integrate climate and disaster risk and resilience into coastal management-related policy frameworks, processes, and responses.
Project Ratings at Terminal Evaluation	Overall Project Outcome Rating	Moderately Satisfactory (4 out of 6 points)
	Overall Quality of M&E	Moderately Satisfactory (4 out of 6 points)
	Overall Likelihood of Sustainability	Moderately Likely (3 out of 4 points)

[10] This component was selected for the ex post evaluation of the project 'Enhancing Resilience of Samoa's Coastal Communities to Climate Change'.

Evaluation Background

The Samoa ex post evaluation is the first of a series of pilot ex post evaluations of strategically selected projects that have been closed between 3–5 years. At the request of the Adaptation Fund Board (the Board), the Technical Evaluation Reference Group of the Adaptation Fund (AF-TERG) is drawing on these projects for post-implementation learning and impact evaluation.

The AF-TERG commissioned the ex post evaluation of this project to analyse one or several project outcome(s) in order to answer two questions:

i. Have the project outcomes/impact(s) been sustained since project completion?
ii. How are the sustained project outcome(s) climate-resilient?

These evaluations aim to gauge the overriding desired impact of the Adaptation Fund (the Fund): "adaptive capacity enhanced, resilience strengthened, and the vulnerability of people, livelihoods, and ecosystems to climate change reduced." The team is working to evaluate this impact across all the ex post evaluations commissioned.

Evaluation Process

National evaluator Karen Komiti began the ex post evaluation at the end of October 2021. It covered different stages over five months: review of project documentation; selection of outcomes to evaluate ex post; field visit and data collection; data analysis; and report write-up.

Before beginning the evaluation, the national evaluator and five key project implementing entity (IE) representatives participated in a three-day training on ex post evaluation, and piloting processes and methods. The training was instrumental in building local capacity on ex post methods and approaches. It also facilitated discussions that led to selection of outcomes for the ex post evaluation pilot.

Evaluation Scope

The scope of the evaluation was determined in consultation with the IE and national stakeholders from the executing entity. The complete report describes the process to select the outcomes for evaluation and the findings of the fieldwork evaluation. The pilot focused on evaluating seven structures in four sites that aim to protect against flooding, storm surges, and coastal erosion:

- Infrastructure Site 1: Salei'a 1 km rockwall and Salei'a 28 m bridge
- Infrastructure Site 2: Manase twin 35 m wave breakers and Manase 90 m rockwall
- Infrastructure Site 3: Vaiala 0.66 km seawall
- Infrastructure Site 4: Salimu/Musumusu 2.2 km road and Salimu/Musumusu 1 km rockwall

Evaluation Methods and Limitations

The ex post fieldwork consisted of administering qualitative community participatory tools, Focus Group Discussions (FGDs), one-on-one Key Informant Interviews (KIIs), transect walks, and field observation.

Target population/sample frame and data collection were limited to households near the structures. Sample size was influenced by available resources and availability of households to participate in data collection. Multiple sampling methods were used, including stratified purposive sampling, and systematic, purposive, and convenience sampling. From a total population of 104 households across five villages/four infrastructure sites, the team selected a target population of 68 who reside closest to the structures. From this group, a sample of 28 households participated in FGDs and KIIs: 17 at Infrastructure Site 1: Saleia rockwall and bridge; four at Infrastructure Site 2: Manase wave breakers and rockwall; and seven at Infrastructure Site 3: Vaiala seawall.

The selection of methodologies and analysis was limited by three factors: 1) there was no ToC at project design; 2) data during project evaluations were collected at the output level rather than at the outcome level; and 3) the selection of infrastructure as a focus resulted in a small sample size.

Findings: Sustainability, Resilience, and Impact

Sustainability

Five years after construction, the structures across four sites/six villages remain physically intact but some sections of Manase and Salimu/Musumusu rockwalls appear to be deteriorating. In general, the structures are adequately and routinely maintained by stakeholders at household, village, and government levels. These activities have not diminished in the years since project closure, despite the absence of secure funding in government operational budget, an infrastructure-specific risk management plan, and co-financing to enable maintenance beyond closure.

Site 1: Salei'a rockwall and bridge

The Salei'a revetment rockwall was completed in 2016 as a protection barrier from wetland and Muliolo stream flooding. The Salei'a bridge was rehabilitated as a replacement of the bridge over the Muliolo stream/river outlet to connect to the rockwall. Following the rockwall construction, heavy rains in 2017 and 2018 trapped water in the encompassed area. Villages were flooded due to lack of drainage outlets in the rockwall and its relocation further back from villages. This led to local efforts to modify the rockwall design and alleviate flooding from behind village homes. This suggests there is emerging sustainability.

Field observation showed that both the rockwall and bridge are kept clean from debris and weeds through village and individual household activities. It also confirmed minor cracks on the crest and

sides of the sidewall due to heavy treading from traffic. However, there is no evidence along the repaired section that recent activities have weakened its structure. Recent climate and human disturbances have led to modifications in the rockwall design. However, they have not subjected the structure to forces beyond the limits of its climate resilience or structural design.

Site 2: Manase twin wave breakers and rockwall

In Manase, the twin breakers and the rock and concrete revetment wall were constructed along the shoreline across two tourist operators. The shoreline protection measures were considered the best option for maintaining the beach and promoting tourism in the village.

Field observations have shown that the rockwall, and around it, is kept clear of debris and creepers by a tourist operator who benefits from the shoreline protection measures. Several sections show signs of deterioration. Despite the lack of local efforts to repair the structure, the rockwall continues to provide adequate coastal protection for surrounding natural and human systems. There are no visible signs of degradation around the wave breakers.

It was reported from both key informant interviews and fieldwork, that wave breakers at Manase accelerated erosion on the adjacent beaches due to re-directing of waves to the west. Field observations and satellite images confirmed severe sand erosion following construction of the wave breakers. In addition, reports of sand mining on private land were also confirmed. This highlighted potential maladaptation and the possible reverse progress made by the structures in replenishing sands and protecting shoreline in the long term.

Site 3: Vaiala seawall

Vaiala seawall was completed in 2015 to protect against tidal tides and storm surges. Its design allowed for utility services (e.g. electric power lines), which were previously located on the coastline, and for a cement pedestrian footpath both at its crest and base.

In the 2018 Community Integrated Management (CIM) Plans for Vaimauga West, the Vaiala seawall was deemed “in very good condition”. It was also reported to have “improved the scenery” along the Vaiala coast. Field observations showed no visible defects on the seawall. The structure continues to provide adequate coastal protection for surrounding natural and human systems. There was no structural damage following recent climate disturbances, and the seawall has become a key recreational feature in the Apia urban area.

The Vaiala seawall demonstrates the most indications of clear sustainability i.e. it has no visible defects and a clean structure. High ownership could be observed in the villages. Routine lawn maintenance by the Land Transport Authority (LTA) is augmented by Ministry of Natural Resources, Environment and Meteorology contractors through waste management and rubbish collection.

Site 4: Salimu/Musumusu road and rockwall

The Salimu/Musumusu road is a 2.2 km stretch, protected by a 1 km rockwall, that aims to protect village properties from coastal erosion and flooding. Field observations have shown some signs of destabilization on sections of Salimu/Musumusu rockwall. Wetland and stream water run-off flows onto the road and there are weeds along the shoulder. In addition, there is no parallel drainage to guide wetland and stream run-off to cross culverts, and ponds on the road. Despite the road condition and the need for maintenance to improve drainage of wetland and stream overflow, neither the LTA nor the villages have tried to make repairs.

The road will likely continue deteriorating. Furthermore, rising sea levels will undermine capacities and limits of infrastructure along the coastline. There is merit in considering the CIM Plan that proposes relocation of key infrastructure and village farther inland, away from coastal and flood erosion hazard areas.

Figure 1. Examples of sustained and unsustained structures

Infrastructure site 3: Vaiala seawall – no visible defects (landside view, left; seaside view, right)

Infrastructure site 4: Salimu/ Musumusu rockwall – rocks are crumbling into wetlands and water is collecting on the road

Table 1: Assessment of Sustainability Conditions

Sustainability assessment	**Findings**
Ownership *Sustained motivation; who benefits from the intervention enough to sustain it locally? Who is using it/ demanding it?*	Ownership is high across all seven structures, mostly at the village level (Salei'a and Vaiala villages), and at household/beneficiary level in Manase (rockwall). Only the Salei'a rockwall was modified by villagers, and not the other six infrastructures that remained intact. This was done to alleviate flooding from behind village homes. The modification reflects the post-approval redesign to meet needs for the bridge repair while expanding gardens and graves for local ownership (but at the cost of asset effectiveness). Soon after its construction, the Salei'a rockwall caused flooding due to lack of drainage outlets in its design and its relocation further back from villages. Trenches were dug during project implementation, which appeared to have solved problems.
Resources *How is the intervention being resourced to be sustained? Are these financial, in-kind, technical, or other?*	The Manase wave breakers and rockwall are the only examples observed that generate indirect resources through sand accumulation; the structures observed during the ex post fieldwork are kept clean by the community (Salei'a rockwall and bridge) and by individual beneficiary households (Manase rockwall). While there are community and government cleaning activities at the Vailala seawall and Salimu/Musumusu road and rockwall, the latter are in dire need of repair and maintenance as the road is already flooding. There are no indications of road maintenance by the Samoan LTA in spite of inclusion in the annual road maintenance plan. In the absence of a large climate shock, the presence of flooding at normal times of this road speaks to unsustainability.
Capacities *What are the necessary project knowledge and skills to be transferred to the national stakeholder partner? How will training be sustained for specific sectoral behaviour change among new entrants onward?*	Project activities directed explicitly at capacity strengthening were not evaluated under the scope of this ex post evaluation.[11] Nevertheless, the evaluation observed that no new capacities were generated at Vaiala seawall and Salimu road and rockwall; however, extensive consultations were held at all infrastructure sites prior to building the structures. Neighbouring villages' key informants believe the Salei'a rockwall provides no direct protection from flooding, and that the Manase wave breakers have accelerated coastal erosion in adjacent beaches.

[11] The ex post evaluation focused on evaluating assets, as these were selected through the process of co-creation with local stakeholders.

Partnership *What continued project knowledge and skills are needed from which stakeholder partners? What local contracting with direct and indirect partners are needed to sustain project operations?*	In general, the structures are adequately and routinely maintained by local stakeholders at household, village, and government levels. The LTA annual maintenance programme plays an important role in maintaining the infrastructures and keeping them clean, at the exception of the Salimu/ Musumusu rockwall that shows deterioration. Local efforts also maintain the structures. For example, the Salei'a rockwall and bridges are kept clean from debris and weeds through village and household activities, and clear of vandalism and loitering through village council curfews, enforced by household closest to the structures. There is also a curfew on the Vaiala seawall, and the village rules also prohibit loitering and littering on the structure. In Manase, the rockwall is maintained by the neighboring tourist operator.

Resilience[12]

The project targeted communities in natural systems marked by increased flooding risks due to increasing frequency and intensity of daily above-average rainfall (>300 mm), and average annual rainfall that will increase by 1.2 per cent into the twenty-first century. This environment is coupled with powerful winds and heavy rains during cyclone events, including Val and Ofa in 1990 and 1991. Heavy rainfall is a threat to livelihoods and human well-being, as well as natural ecosystems. It brings risk of losing terrestrial species and increased risk of saltwater inundating fresh/groundwater. The area also faces significant changes to coastal shorelines and potential habitat loss with rising sea levels. The human systems sustaining project results to date include strong cooperation from beneficiary districts, strengthened human resources in government agencies, and strong political and strategic support. The most relevant policy to the project is the district-level CIM Plans, which serve as the key national reference document for Disaster Risk Reduction (DRM)/ Climate Change Adaptation (CCA) interventions and planning for community development, in the newly launched Planning Development Strategy (PDS) 2021–2026. Table 2 outlines key resilience characteristics exhibited by the intervention infrastructures.

Table 2: Resilience by Characteristics

Resilience characteristics	Findings
Redundancy *(Creating a duplicate or back-up system to support resilience to climate*	The Salei'a rock wall amounted to a hard solution or duplicate barrier to augment forest growth and block the force and volume of inland rivers. It also generated a secondary community backyard/natural space of about 3.6 ha. The additional protected space is sustaining existing agricultural, forestry, and grazing land functions. Given time and reduced saturation, this space has

[12] The AF-TERG developed a resilience analysis framework and applied it during ex post evaluation desk reviews and fieldwork. Details of the framework are available in Annex III.

disturbances if/when one option fails)	potential for improved farm production and yields, reduced inundation and erosion of habitat, and functionality. The Salimu/Musumusu road and rockwall replaced an older road and rock defense, and connected Uafato to Falefa, which serves as a back-up in case of disruptions to other routes.
Diversity *(Reflecting a wide and deep variety of actors and inputs working towards common goals in complexity and climate resilience)*	All four infrastructure sites involved some collaboration among a variety of villagers, contractors, and national government to build, and later maintain, the structures. The Salei'a rock wall has engaged a variety of actors (national government, community leaders, community households) to plan and maintain rockwall functions. There is also some anecdotal evidence of less frequent inland flooding and water overflow disturbances, and no loss of tree cover even after flooding, which may support local biodiversity. In terms of biological diversity, the Manase wave breaker has anecdotally shown evidence of protecting fish life, turtles, and shellfish; and evidence of beach and environmental restoration (for the immediate coastline). However, as observed during fieldwork, the wave breakers inherently change the way beaches erode/move (especially to the southwest of this wave breaker), The long-term impact of this beach movement is not known.
At Scale *(Providing the temporal or spatial scale needed for natural and/or human systems to maintain or change their functions and/or structures in the face of climate disturbances)*	The benefits of the Salei'a rock wall have the potential to maintain or change (human and natural system) functions by generating newly utilized space and to produce communal benefits in response to climate disturbances. The space has been used for growing bananas, cocoas, tamarinds, pandanus, and nitrogen-fixing gatae; and some horse grazing. Two dwellings have been built since asset completion in 2016.
Dynamism (flexibility) *(Demonstrating flexibility – around an equilibrium – in approach and strategy towards reaching common objectives)*	The hard infrastructure of the rock wall and wave breakers both serve to reduce the dynamism of natural systems. In the case of the Salei'a rock wall, the area behind the wall became a vegetated communal space with potential for future flexibility/adaptability in (household/local) use under changing conditions. The Manase wave breakers have reduced dynamism of natural sand movement along the beach. This has resulted in beach replenishment and shoreline stabilization for two tourist operators south and southeast of the assets since completion. However, the reverse – rapid shoreline erosion – is also occurring on shorelines to the southwest of the assets, and demonstrates an example of maladaptation.

Continuous Feedback Loops *(Supporting communication lines, access to information or partnerships for sustainability of outcomes)*	The Salei'a rockwall generated some natural feedback loops between neighbouring communities by physically connecting them with a communal space and also requiring cooperation for maintenance.

As far as the resistance-resilience-transformation typology, all seven structures exhibit various levels of resilience (mainly passive resistance and some resilience)[13]. All have remained standing in the face of several climate disturbance impacts in the intervening years. The impact of Category 2 Tropical Cyclone Gita in 2018 landed at winds of 86 km/h and gusts of 115 km/h. Heavy rainfall events in December 2020 and January 2021 measured above average (>300 mm) daily rainfall records of 932 mm, which were reportedly felt mainly on Upolu Island. The impact on Savaii Island residents was limited to a few damaged beach huts, and disruptions to electricity, communications, and water supply.

The Salei'a rockwall ensures its primary function of continued protection and alleviation of flooding. It also exhibits characteristics of resilience, as it serves new purposes for the population and natural environment e.g. a new growing space. Shoreline protection measures comprise the Vaiala seawall, Manase wave breakers and rockwall, Salimu/Musumusu road and rockwall, and Salei'a bridge. They have maintained intended functions to control coastal erosion within the surrounding human (village dwellings) and natural systems (eroded beach and shoreline). However, beach erosion has drifted southward in the case of the Manase wave breakers.

Impact

Emerging Project impact

The project aimed to reduce the vulnerability of Samoa to the effects of climate change and respond to this threat, particularly through reduced exposure to climate-related events and increased adaptive capacity within the relevant development and natural resources sector.

Regarding this objective, all seven structures have addressed vulnerabilities of communities regarding the targeted hazards. With all infrastructures still standing post-project completion, such structures have reduced the population's exposure to climate-related events. Sustainability prospects,[14] however, are better for some infrastructure sites (Vaiala seawall, Manase twin wave breakers and rockwall) than others (Sale'ia rockwall and bridge, Salimu/Musumusu road and rockwall).

[13] See Annex III. on Resilience analysis framework for more details on levels of resilience.

[14] Sustainability prospects were assessed to the degree possible without engineering records and study.

The project has had unintended impacts. Salei'a rockwall caused flooding due to lack of drainage outlets; and Manase wave breakers are claimed to have accelerated sand erosion on adjacent beaches.

Adaptation Fund impact

In relation to the intended impacts – "adaptive capacity enhanced, resilience strengthened and the vulnerability of people, livelihoods, and ecosystems to climate change reduced", all seven structures withstood several climate disturbances impacts in the intervening years. However, the capacities and limits of the structures have yet to be tested by severe or prolonged force of climate shock events, such as Category 4 Cyclone Evan in 2012 and the 2009 tsunami. The past climate disturbances had only limited impact on Savaii Island residents during the intervening years.

Conclusions

Sustainability: The evaluator revisited the key assumptions and risks to project sustainability in the ToC that was recreated during the evaluation process , as well as the sustainability projections made at project completion in the final evaluation. This aimed to assess if assumptions were still valid and needed to be confirmed during fieldwork. The assessment, which occurred during preliminary fieldwork, concluded that the projection of sustainability (rated "likely" at project level) made at the final evaluation was mainly correct.

Resilience: The resilience analysis tool indicates that the infrastructures exhibit various levels of resilience, mainly passive resistance and resilience, in the face of warming temperatures (projected to reach 2.7^0C by end of the century) and sea-level rise (expected at 5.2 mm per annum).

Impact: All infrastructures have addressed vulnerabilities with regards to flooding, storm surges and coastal erosion, and enhanced the adaptive capacities of communities along the shoreline and wetlands. How well this was done depends on the infrastructure; half show signs of deterioration. It is also unclear how long this impact will last, given there were no large climatic shocks to test the structures since project completion. Climate and natural events will, however, continue with progressive severity. The evaluation has shown that communities are still vulnerable to other multiple hazards.

Lessons Learned and Corresponding Recommendations

Lesson Learned: The process for outcome selection allowed the ex post evaluation team to draw important lessons, particularly regarding how to evaluate assets ex post, deal with data quality and/or availability for ex post. For example, the review of the project results framework showed there was no ToC at project design, and that only output-level data were collected during project evaluations. In addition, there were no indicators or measures in the project results framework

that enabled the collection of data that could capture change; i.e. there were no measurable outcomes for change.

Recommendation: Improve M&E quality from baseline to endline.

Lesson Learned: Rigid structures generally require less maintenance. The project-funded structures were built to withstand extreme climate disturbances with a typically useful life of least 30 to 50 years. Therefore, they are not prone to gradual degradation in strength. Funding for monitoring structures following the completion of the project could identify the premature deterioration of structures that might necessitate their repair and eventual replacement.

Recommendation: Given the capital investments in the structures, clear maintenance agreements with the government or other actors should be included in the project design.

Lesson Learned: With reference to the shoreline and flood protection measures that were evaluated, insufficient time and severity of natural and climate disaster events have occurred to adequately weather/test the sustainability and resilience of the structures. However, the evaluation can conclude that these structures will increase resilience with respect to livelihoods and ecosystems.

Lesson Learned: Wave breakers and rockwalls, although not prone to gradual degradation in strength, are known to suddenly fail under storm surges. The 2014 technical assessment of the measures recommended ecological monitoring of the structures every six months, as well as ongoing maintenance of beach replenishments.

Recommendation: Given the terminal evaluation report, there is merit in undertaking a detailed close range examination of structural components to determine structural concerns, defects, damage, or deterioration.

Additional Lessons and Recommendations from the Pilot

For Implementing Entities

Lesson Learned: Post-implementation systematic capturing and dissemination of cross-sectoral adaptation experience is needed to support integrated adaptation measures at national and community levels.

Recommendation: Build institutional memory. The project should leave behind information for stakeholders and communities in clear data retention knowledge management systems at both donor and national levels. This would allow for continuous learning that could inspire enhancements to their resilience to climate change.

Lesson Learned: Limited civil engineering technical capacity was available to review solutions. Built capacity did not translate to provision of technical support to communities in techniques for analysis, structured evaluation of options, and selection of preferred responses. Filling these gaps would allow for informed site-specific adaptation assessments, planning, and technical measures, and especially quality assurance to reduce the risk of maladaptation caused by the options selected.

Recommendation: Fill technical capacity gaps at the community level to supervise the civil works funded by the project.

Lesson Learned: A more strategic assessment of alternative ways, options, or locations would maximize the impact of interventions funded under the project.

Recommendation: Apply due diligence and quality assurance before committing to a specific site and structure.

Lesson Learned: A key enabler to implementing ex post methods is record-keeping at IE level. This would enable the measure and capture of data that could demonstrate change in capacities or assets that are the focus of ex post evaluation. Basic engineering plans were not available at donor or government sites for the structures supported by this project, which complicated the evaluation.

Recommendation: Keep good records for at least five years after project completion enforced via post-implementation data archiving indicators in the results framework.

For the Adaptation Fund and funders

<u>* For projects designed with infrastructure components:</u>

1) Create/develop institutional mechanisms within agencies responsible for the activity implementation, as a component, early in the project. This should enable and ensure that project infrastructures are subjected to required technical due diligence in design, construction, and maintenance.

<u>*For improvements in M&E to capture data on sustained results after project completion:</u>

Two recommendations were provided by the in-country evaluator, with regards to capturing data at higher levels:

1) Incorporate indicators for ex post evaluation in the results framework at project design. This would help inform project IE and key stakeholder agencies of reporting obligations at post-implementation, and the data needs required for ex post evaluation, prior to the end of the project.

2) Create/develop post-implementation results framework with key indicators designed/defined to capture sustained results e.g. a focus on outcome-level indicators.

*For continued awareness about project results and how they have reduced vulnerabilities/ enhanced resilience of communities:

1) Create/develop a communications platform that captures project products early/right at the start of the project. This would include a communications strategy that guides how the project products and key information would be kept during and after project completion; how the receiving ministry would institutionalize results before project end; and how awareness and updates of results would be disseminated after project end.

For the AF-TERG on methods

1) The ex post team should discuss the merits of using a Theory of Sustainability, which was used instead of a Theory of Change, for subsequent ex post evaluations. The Theory of Sustainability produced different outcomes and outputs than stated in the project results framework/Theory of Change produced at project design. This choice affected the selection of outcomes for the evaluation. In a similar way, training materials should balance the examination of resilience and sustainability with an understanding of the operating environment follow project implementation.

2) Simplify methodologies and research questions and contextualize/customize data-gathering tools. The Samoa pilot implemented a “good enough methodology,” but it was difficult to apply the concepts to data collection at community level.

Annex II. EX POST EVALUATION (ECUADOR)

"Enhancing Resilience of Communities to the Diverse Effects of Climate Change on Food Security in the Pichincha Province and the Jubones River Basin of Ecuador, FORECCSA"

Ex post evaluation summary

An orchard funded by the Adaptation Fund.
Nabón, Ecuador, 2022

Technical Evaluation Reference Group
ADAPTATION FUND

Project General Information

AF Project ID	ECU/MIE/Food/2010/1	
Country	Ecuador	
Project Title	**Enhancing Resilience of Communities to the Adverse Effects of Climate Change on Food Security in the Pichincha Province and the Jubones River Basin, FORECCSA**	
Intervention Area	• Four provinces in Ecuador highlands: three at the Jubones River Basin (Azuay, El Oro and Loja), the other was Pichincha (without geographic connection) • 12 cantons, 52 parishes and 240 communities and small villages • 39 parishes were in the Jubones River Basin and 13 outside of it (Pichincha Province).	
Implementing Entity	**Type**: Multilateral Agency (MIE) **Name**: UN World Food Programme (WFP)	
Executing Entity	Ministry of Environment of Ecuador (now Ministry of Environment, Water and Ecologic Transition, MAATE), in coordination with the Ministry of Agriculture and Livestock, the Government of the Province of Pichincha and 35 local governments of the Jubones River Basin	
Budget (USD)	US$ 7,449,468	
Start date	29 November 2011	
Completion date	15 June 2018	
Years	Seven years	
Sector	Food Security including sub-sectors: (i) land rehabilitation; (ii) protection; (iii) regeneration; (iv) reforestation; (v) water management; and (vi) storage structures	
Overall Goal	Reduce vulnerability and food insecurity of communities and ecosystems, related to the adverse effects of climate change, in the most vulnerable cantons of Pichincha Province and the Jubones River Basin	
Project Components	**Component 1**. Develop awareness, knowledge and capacity at the community level on climate change and food insecurity related risks	**Component 2**. Increase adaptive capacity and reduce recurrent risks of climate variability at the community level[15]
Component Objectives	**Objective 1:** Increased knowledge to manage climate change risks affecting food security in targeted cantons in Pichincha Province and Jubones River Basin	**Objective 2**: Strengthen adaptive capacity to respond to the impacts of climate change, including variability in cantons in Pichincha Province and Jubones River Basin
Component Outcomes	**1.1.** Increased awareness of communities on climate change and food security related risks **1.2.** Secured ownership of adaptation measures in communities in targeted cantons **1.3.** Increased knowledge to manage climate change and risk, including climate variability affecting food security	**2.1**. Increased adaptive capacity and ecosystem resilience in targeted rural parishes **2.2.** Increased capacity at parishes and institutional level to manage climate change risk in the targeted cantons
Project Ratings at Terminal Evaluation	Overall Project Outcome Rating	Satisfactory (5 out of 6 points)
	Usefulness of the M&E System	Moderately satisfactory (4 out of 6 points)
	Risks to Sustainability: Env. Risks and Uncertainty of Impacts of Climate Change	Moderately probable (3 out of 4 points)

[15] This component was selected for the ex post evaluation of the project 'Enhancing Resilience of Communities to the Adverse Effects of Climate Change on Food Security in the Pichincha Province and the Jubones River Basin, FORECCSA'.

Evaluation Background

The Ecuador ex post evaluation is the second of a series of pilot ex post evaluations of strategically selected projects that have been closed between 3–5 years. At the request of the Fund Board, the Technical Evaluation Reference Group of the Adaptation Fund (AF-TERG) is drawing on these projects for post-implementation learning and impact evaluation.

The AF-TERG commissioned a post evaluation of the FORECCSA project to analyse one or several project outcome(s) in order to answer two questions:

i. Have the project outcomes/impact(s) been sustained since project completion?
ii. How are the sustained project outcome(s) climate-resilient?

These evaluations aim to gauge the overriding desired impact of the Adaptation Fund (the Fund) which is: "*adaptive capacity enhanced, resilience strengthened and the vulnerability of people, livelihoods, and ecosystems to climate change reduced*." The team is working to evaluate this impact across all the ex post evaluations commissioned.

Evaluation Process

National evaluator Monica Ribadeneira Sarmiento began the Ecuador post evaluation in November 2021. Over 10 months, it was carried out in different stages: (i) review of project documentation; (ii) capacity-building training; (iii) selection of outcomes to evaluate ex post; (iv) field visit and data collection; (v) data analysis; and (vi) report write-up. Much time was spent looking for key documentation, including an outcome survey and participant lists.

Evaluation Scope

The selection of outcomes for evaluation focused on Component 2 of the FORECCSA project – concrete adaptation interventions (assets) – rather than adaptive knowledge and capacities (Component 1). The evaluator chose Component 2 because of better data availability and quality. Another intended use of the evaluation was to provide lessons for WFP programming on water in the north of the country (Colombia-Ecuador binational project on building adaptive capacity to climate change through food security and nutrition actions).

Within Component 2, the FORECCSA project had 86 adaptation interventions, clustered into nine groups and targeted at 240 communities highly vulnerable to droughts related to water and food security. The interventions *in italics* were assessed as part of the ex post evaluation.

Water security:

1. *Enhancement of community-level irrigation*
2. *Provision and enhancement of plot irrigation systems*
3. Water source protection
4. Improvement of water availability for human consumption

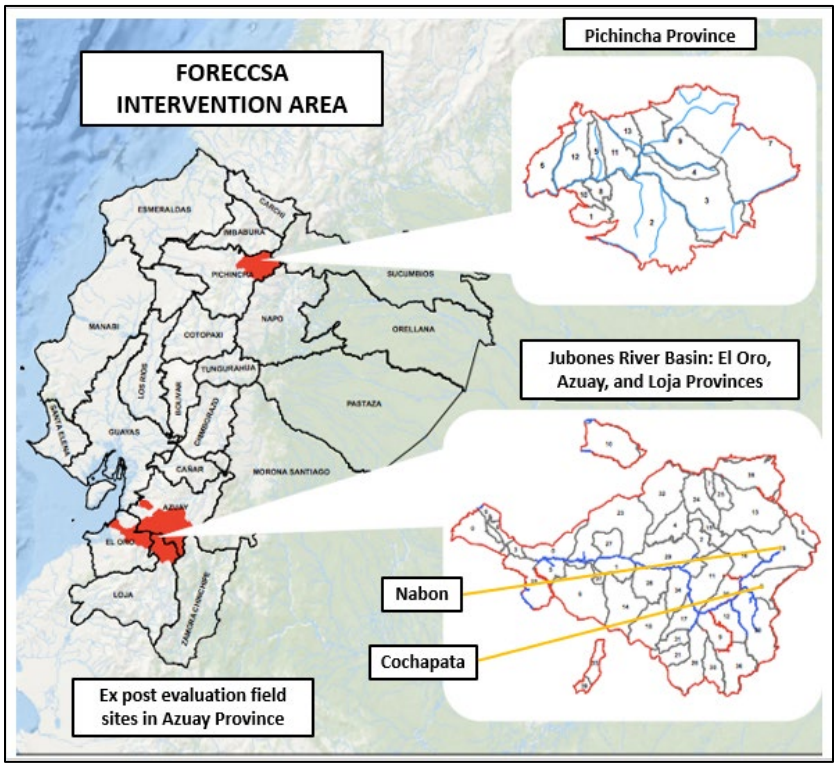
Food Security:

5. Handling of small livestock
6. *Homestead gardens and family orchards*
7. Agroforestry systems
8. Organic fertilizer management
9. Promotion of seeds resistant to droughts and freezing

The project was targeted to address the following weaknesses in the parishes in the Jubones River Basin:

- High levels of food insecurity
- Climatic threats such as the melting of glaciers, intense rains and droughts, among others
- Lack of public policy to prepare local populations and their livelihoods to be resilient to the threats

Map 1. FORECCSA Intervention and Evaluation Area



Source: WFP FORECCSA presentation (2018)

The evaluator looked for locations with "*Strengthening community irrigation in drought areas*" combined with food security activities ("*Promotion of gardens/vegetable orchards*"). This yielded three cantons and seven towns for the ex post evaluation. With the input of WFP's monitoring and evaluation focal point, the ex post evaluation pilot focused on evaluating the sustainability and resilience of water infrastructures (reservoirs and piped irrigation) and homestead gardens and

orchards in two sites: Nabón and Cochapata (both in Azuay Province). Given the expected outmigration from this province, an additional city, Celén (Loja Province), was added.

The interventions* evaluated were:

Parish	Adaptation interventions financed by the Adaptation Fund	Detailed evaluated interventions for food and water security[16]
Nabón	Protection of water sources, improvements of piping networks for irrigation water and improvement of family gardens and orchards in Nabón Centro	• Improvement of water catchments / water driving lines (1.30 km/378 families) • Plantation of fruit trees and horticultural species and distribution of vegetable seeds (105 families)
Cochapata	Improvement of community irrigation infrastructure and the technical-productive capacities of the farmers of the upper, middle, and lower zone in the parish of Cochapata	• Improvement or rehabilitation of a system of three communal reservoirs • Improvement of water driving lines (2.50 km/400 families) • Plantation of fruit trees and horticultural species and distribution of vegetable seeds (54 families)
Celén*	Improvement of the Tres Quebradas-Gañil irrigation system and implementation of gardens in the parish of El Paraiso de Celén	• Improvement of water catchments/water driving lines (4.10 km/75 families) • Plantation of fruit trees and horticultural species and distribution of vegetable seeds (200 families)

- So few people were available to interview in Celén that their data were not sufficient for analysis. Findings are considered anecdotal.

Evaluation Methods and Limitations

The ex post evaluation followed a co-creation process. It thus engaged the implementing entity (IE), WFP Ecuador, in the choice of the outcome to evaluate. This aimed to ensure learning and usefulness for the country counterparts. The AF-TERG trained both WFP senior staff and the evaluator on ex post evaluation concepts and methods. A qualitative matrix was used to triangulate findings, although tools were not pretested and the quality of the field data for analysis was variable.

The fieldwork took place between May and June 2022, at the end of the rainy season, which was not comparable to the dry season i.e. the season targeted by the project. Reservoirs were fed by

[16] This column describes the evaluated assets, as achieved at project completion.

rainwater during the fieldwork, leaving it more difficult to know whether benefits were similar during the dry season.

Fieldwork consisted of Focus Group Discussions (FGDs), one-on-one Key Informant Interviews (KIIs), and transect walks for field observation in all three sites. Other tools such as mapping, seasonal calendars, timelines, and rankings were used selectively when enough respondents were found (for example, in Cochapata). Efforts were made to isolate water use to the orchards and gardens rather than for other crops such as corn and wheat. Site visits confirmed use of the reservoirs and piping systems.

Table 1. Overview of Topics Covered during Field Interviews

Water infrastructure and orchards
Sustainability of intervention
Access and use of intervention
Impacts and benefits of intervention
Distribution of benefits across the community
Resilience
Capacity to meet food or water security needs
Capacity to sustain climatic shocks and stresses
Resilience characteristics: redundancy (*e.g. back-up systems*); at scale (*e.g. impactful as a result of time/timing or size/dimension*); diversity (*e.g. ecological or involvement of vulnerable groups*); feedback loops (*e.g. information sharing and partnerships*); dynamism (*e.g. adaptive management/actions*)

Source: AF-TERG ex post evaluation interview protocol (2022)

There were logistical and planning challenges *i.e. access to pre-fieldwork preparation support, funding and former staff unable or unwilling to accompany the evaluator.* In addition, there was outmigration related to COVID-19 and work in mines and cities from targeted project sites. As a result, only 19 beneficiaries were interviewed during the fieldwork: Nabón (four), Cochapata (14), Celén (one). This is in addition to two senior staff from the WFP team.

Cochapata had the largest number of respondents (14 of the 54 families who benefited from water and food security interventions). Only four participants were found for qualitative interviews in Nabón, although both interventions had helped more than 100 people. Similarly, in Celén, the evaluator only found one participant willing to speak after three days of looking for respondents in the field. The limited participation compromised the robustness and representativeness of findings, and limited findings of this report to Azuay Province.

Findings: Sustainability, Resilience, and Impact

Sustainability

There were a series of shocks in both sites of Azuay Province since FORECCSA closed in 2018:

- Droughts (in 2018 in Nabón, and in 2019 and 2022 in Cochapata)
- The economic crisis caused by COVID-19, and subsequent outmigration from Ecuador, with strong evidence in Nabón
- A landslide (in 2021 in Nabón)

Site 1: Nabón

In Nabón, FORECCSA constructed 1.30 km of private water lines and provided pumping systems to landowners, which enabled them to connect to public water channels. At ex post, nearly half of beneficiaries in Nabón did not have access to piped water anymore because a landslide in December 2021 had destroyed the neighbourhood of Las Rosas and blocked La Laguna — the public water channel. This forced people to return to a traditional water source, the Chalcay River, if they were living in its vicinity. They used new pumps and pipes provided by the FORECCSA project or purchased them anew when they wore out. Those living far from the river depended on rain only for their crops and orchards. All four respondents praised water piping where it was still available. Nonetheless, none changed their cultivation or climate-resilience cropping to address the droughts or decreased water supply.

In Nabón, FORECCSA also provided fruit trees (peach, pear, and avocado) and horticultural species. This allowed 105 families to have their own orchards in the Casal Bajo La Laguna neighbourhood. At ex post, most lands, and consequently orchards, had been abandoned. Due to the economic crisis and the pandemic, the city experienced an intense wave of migration towards mines, cities, and other countries. Nabón became a “ghost town” — the very result the project was aiming to avoid. Where people stayed, a few orchards were working. All four people interviewed consumed or gifted the avocados, peaches, and vegetables to friends and families as social capital, but none sold them to the market. Tellingly, the abandoned farms’ fruits and vegetables were left to rot without being gathered by anyone for the migrants’ return or sale during their migration.

Figure 1. Abandoned garden with piping, Nabón (2022)

Source: AF-TERG field visit (June 2022)

Site 2: Cochapata

In Cochapata, FORECCSA rehabilitated a long-abandoned system of three communal reservoirs. This made it the most sizeable investment visited out of the evaluated sites, as well as the most successful. The respondents are relying on reservoirs for all their irrigation needs; before the project, they relied on rainwater. Nearly all (93 per cent) also used water from the reservoirs to cultivate their orchards and gardens. The infrastructure consists of three reservoirs supplied with two public water channels (Shinkata and Culebrillas). They are connected with reinforced pipelines and a pressure pumps net. At ex post, the system had been maintained through biannual communal work performed by the families. The population used it widely for their agriculture needs.

In Cochapata, FORECCSA orchards assisted 54 families. At ex post, the lands visited with the communities through transect walk had been maintained. Families were both consuming and selling the fruit, although few knew for how much it could be sold. For the interviewees, selling products was not a priority. The production cost had become too high for them because of elements such as fertilizer. Contrary to Nabón, Cochapata did not experience large outmigration.

Figure 2. Rehabilitated reservoirs in Cochapata (2022)

Source: AF-TERG field visit (June 2022)

Other Sustainability Findings

When designing FORECCSA, WFP put in place a sustainability plan for each intervention. As one key issue for sustainability, the plan relied on the capacity-building of local authorities or institutions. In other words, parishes rather than the local community had to maintain and monitor the project outcomes. While capacities were not evaluated in this ex post evaluation, this issue has proved to be a major challenge for the sustainability and maintenance of project results, at least in Nabón. In Cochapata, the size of the investment, the lesser scale of migration, and the ownership of communities for water infrastructure allowed better sustainability of outcomes.

Table 2: Assessment by Sustainability Conditions

Sustainability assessment	**Findings**
Ownership *Sustained motivation; who benefits from the intervention enough to sustain it locally? Who is using it/ demanding it?*	Ownership seemed weaker in Nabón because of outmigration and lack of water from the landslide. There seemed to be little ownership of the orchards and gardens, which had been abandoned. There was strong ownership of Cochapata reservoirs. People used the water for consumption and agricultural production. They also organized the voluntary biannual maintenance, as well as continuing to cultivate crops.
Resources *How is the intervention being resourced to be sustained? Are these financial, in-kind, technical, or other?*	In Nabón, the absence of investments to repair the water supply post-landslide by municipal authorities speaks to a lack of long-term water security prospects. Food security was weaker as people mostly abandoned the farms. Those remaining used the orchard production as social capital rather than to generate income from sale of produce. Nonetheless, mining income clearly was more remunerative and could lead to food access via cash purchases. Food production only seemed to generate income in Cochapata. Even there, income seems to be marginal. People could not recall how much money they made from the orchards (avocados or peaches).
Capacities *What are the necessary project knowledge and skills to be transferred to the national stakeholder partner? How will training be sustained for specific sectoral behaviour change among new entrants onward?*	In both sites, participants knew how to maintain either the piping or the reservoirs. Some mentioned training their children to do so, which points to sustainability. There was no evidence of food security replanting/ extension in either site. In Cochapata, five participants were planting coffee to withstand higher temperatures, which could be an emerging outcome (that still has to demonstrate results), as it was using FORECCSA water.

Partnership *What continued project knowledge and skills are needed from which stakeholder partners?* *What local contracting with direct and indirect partners are needed to sustain project operations?*	There seem to be no partnerships in the Jubones River Basin area supporting the communities for assets maintenance.

Resilience[17]

In terms of climate disturbances, FORECCSA targeted highly drought-prone regions. In these areas, extended periods of drought led to crop loss, lack of food and water, and plant and animal diseases. Natural systems of the project sites differed largely by province. El Oro Province is characterized by lowland areas. Azuay and Loja provinces, where evaluated sites are located, are highland areas (part of the Andean mountains). Different types of investments were made in the communities to allow access to river water; most of the sub-basins stream towards the Jubones River. In 2020, in terms of human systems at the national level, the Ministry of Environment (former MAE) and the National Secretary of Water (former Senagua) were merged into an institution (MAATE, Ministerio del Ambiente, Agua y Transición Ecológica de la República del Ecuador). Presumably, they had less technical capacity owing to turnover, but there is no evidence of how the merger may have affected project outcomes. At the local level, *mingas* (communal working groups) maintain the reservoirs and public water lines by keeping them free of debris. As far as the nexus between human and natural systems, the agricultural plots generated or improved by FORECCSA were largely abandoned due to outmigration in Nabón. There is no further evidence of how FORECCSA outcomes influenced or were influenced by the intervention measures at the nexus (such as policies, skills, land-use practices, etc.).

The fieldwork findings demonstrated both positive and negative prospects in terms of resilience characteristics across the targeted outcomes (food security and water management) and their related human and natural systems. Table 3 highlights observations about these characteristics.

Table 3: Resilience by Characteristics

Resilience characteristics	Findings
Redundancy *(Creating a duplicate or back-up system to support resilience to climate disturbances if/when one option fails)*	The provision of water through the improvement or construction of water infrastructure aimed to help people achieve greater water and food security with “back-up” or secondary options in drought conditions. In Nabón, the obstruction of a public water channel due to a landslide means that people are either left with little

[17] The AF-TERG developed a resilience analysis framework and applied it during ex post evaluation desk reviews and fieldwork. Details of the framework are available in Annex III.

	water for basic needs or resort to using river water as a back-up system. Those who live close to the river may also pump their water from there, even when they have access to an unobstructed public channel. The unmanaged overextraction of the river could potentially have negative environmental or health consequences. This means that in Nabón, FORECCSA water investments were not sufficient solutions to sustainably enhance water security. Conversely, in Cochapata, the reservoirs provide a valuable source of water for the population i.e. they provide enough water to irrigate around 800 ha of land. Because of the reservoirs' utility, neighbouring communities are also building their own private reservoirs. The orchards were designed as a back-up for food security. In all sites, orchard products did not help generate sufficient income or food for consumption to be a critical back-up option for people.
Diversity *(Reflecting a wide and deep variety of actors and inputs working towards common goals in complexity and climate resilience)*	With the exception of Celén, the evaluated sites did not have a high percentage of Indigenous peoples, even though the project was implemented in the Andean Mountain region. Only two of 240 communities selected by FORECCSA were considered as indigenous (Celén and Saraguro). The high level of migration observed in Nabón showed the project did not significantly improve livelihoods or provide access to alternative livelihood options.
At Scale *(Providing the temporal or spatial scale needed for natural and/or human systems to maintain or change their functions and/or structures in the face of climate disturbances)*	One of the most significant differences between Cochapata, which had three communal reservoirs, and Nabón (and potentially Celén), which had small private investments, lies in the scale of the interventions. Almost the same number of families were targeted in Nabón and Cochapata (378 and 400, respectively). However, the size of reservoirs and water storage capacity in Cochapata (about 50,000 m^3) may have helped make it relevant to the community. It is not clear whether the reservoirs contributed to a lesser economic migration from Cochapata. However, FORECCSA's water (or food) investments did not prevent outmigration from Nabón. Equally, Cochapata was the only visited site where interviewed people described an increase in agricultural productivity because of water availability and FORECCSA seeds. In all visited sites, the fruit trees seemed to be more of a marginal benefit. For example, they provided social capital through trading, gifting, or occasional selling or

	consumption, rather than becoming a centrepiece of the community's food security.
Dynamism (flexibility) *(Demonstrating flexibility – around an equilibrium – in approach and strategy towards reaching common objectives)*	On migration: see conclusion in row "*at scale*" While no examples of dynamism were observed in Nabón and Celén, Cochapata exhibited dynamism several times: • People are learning to store excess water from rainfall in private reservoirs for security against summer droughts. • Five farmers are experimenting with the cultivation of coffee using the water they are accessing from FORECCSA investments; they observed that temperatures are getting warmer and that this crop could be easier to grow and be more profitable.
Continuous Feedback Loops *(Supporting communication lines, access to information or partnerships for sustainability of outcomes)*	In Cochapata, FORECCSA beneficiaries organize themselves to maintain the three reservoirs through voluntary communal work (*minga*). Young people sometimes replace their parents in this task, allowing for generational transfer.

The overall strategy of the outcomes was to maintain systems (and their structures and functions) for water management and food security. Thus, the resilience of FORECCSA investments can be classified as active and passive resistance on the resistance – resilience – transformation (R-R-T) typology[18]**.** The extension of public water lines and reservoirs amplify existing structures i.e. they offer the same function as before the intervention i.e. water provision, and are actively maintained. The drought-resistant seeds were also a form of passive resistance to an average decrease in rainfall i.e. food provision. There is no evidence of transformational or resilience elements, as neither of the evaluated assets provided additional benefits or served an additional purpose than the one intended at design *i.e. there are no fundamental functional or structural changes.*

[18] See Annex III. on Resilience analysis framework for more information on levels of resilience.

Impact

Emerging Project impact

The theory of change (ToC) stipulated that increased water quality and access for irrigation, as well as increased food production in the dry season, would lead to diversification of food consumption and greater access to food. Ultimately, this would reduce vulnerability and food insecurity.

The following conclusions can be drawn regarding the potential impact of FORECCSA:

- In Nabón, increased access to water was only partial and not sustained for about half of the population. While the other half of the population had access to water, some reverted to river access, and most had out-migrated.
- In Cochapata, the reservoirs have significantly increased access to water. However, the impact of reservoirs on food security is unclear as participants did not speak of orchards or gardens as key assets. It is impossible to say whether FORECCSA had an impact on food security.
- In general, investments were not large enough to allow noticeable income growth or improved food consumption. Either that, or the investments cannot be isolated given only three days of evaluation per site, lack of access to a representative sample of respondents, and their income/consumption.

Adaptation Fund impact

In relation to the Fund impact “adaptive capacity enhanced, resilience strengthened and the vulnerability of people, livelihoods, and ecosystems to climate change reduced”, it can be concluded that:

- In Nabón, multiple shocks and vulnerability (COVID-19, economic crisis, drought, landslide) have contributed to large populations migrating out of the town. For the remaining population, FORECCSA’s investments in water food security were not sustainable or relevant enough to enhance their adaptive capacity.
- In Cochapata, resilience to drought impacts was enhanced, as water availability has increased. The food security inputs did not appear to be pivotal enough to address vulnerability. It is not possible to know if adaptive capacities were durably enhanced.

Conclusions

The FORECCSA project was a first remarkable national learning-by-doing experience for an adaptation project with highly adaptive management to adjust implementation. This could explain why many intervention strategies were not properly recorded, systematized, or planned.

The project was highly transparent with communities and followed a participatory process. This included measures such as local diagnostic of local climate vulnerabilities, participatory definition of local adaptation measures, and transparency on budget accounts with the community. WFP replicated some apparent cost-sharing in the new project in the northern border between Colombia and Ecuador.

No discernible differences were found in the responses of men and women. That said, the small sample size of 18 in two sites cannot be defensibly analysed for gender trends.

As FORECCSA targeted landowners, the participation of young people and women was marginal.

Sustainability: The fieldwork showed that sustainability of outcomes after project completion was only moderate. This result was driven by partial ownership of assets depending on the site, few resources for partnerships, and a limited impact on "decreased vulnerability." Results differed significantly between sites. Assets in Cochapata were relevant and well maintained by the community, but those in Nabón were partially unusable or abandoned.

Resilience: The resilience analysis tool indicates weaker prospects for climate resilience. The resilience characteristics exhibited by the assets did not seem to influence food security in both sites or were not enough to prevent outmigration from one site. The overall strategy of the outcomes was to maintain systems (and their structures and functions) for water management and food security. Thus, the resilience of FORECCSA investments can be classified as active and passive resistance on the R-R-T typology.

Impact: Increased provision of water in Cochapata addressed vulnerabilities to drought. However, water infrastructure was not able to withstand a climate shock in Nabón. Access to water was thus fully achieved in Cochapata but not in Nabón. In both sites, the investments were not large enough to allow noticeable improvement of food production or consumption.

Lessons Learned and Corresponding Recommendations

Lesson Learned: The availability of data for FORECCSA was limited as project information was not systematically recorded and stored. While data were widely available at the output level, it was more difficult to find information at the outcome level (the FORECCSA outcome sustainability survey, conducted at endline and referenced in the final evaluation, had been lost). Ex post mostly focuses on outcomes, and this survey seemed to be the only document with outcome-level data available. Therefore, the unavailability of such data was a significant quality issue for the evaluation. Further, lack of participant data led to difficulties in finding respondents. This was a

major barrier, as was the lack of former or current WFP staff available or willing to accompany the evaluator to the sites.

Recommendation: Improve data management systems at the IE level.

Lesson Learned: The site and outcome selection took longer than anticipated, and required discussions between WFP, the evaluator, and the AF-TERG. WFP's initial selection had to be adapted by the AF-TERG to fit the evaluation requirements. Each institution used evaluation concepts (e.g. "resilience") in different ways. This conceptual language barrier between the WFP team and the AF-TERG was amplified by a Spanish-English language barrier, which further delayed the process. A similar back and forth had to be done for site selection.

Recommendation: Provide better support to IEs and evaluator during outcome and site selection.

Lesson Learned: Methods had to be adapted, given the reality of the field and the small number of people available e.g. the primary data-collection method was qualitative KIIs, as well as transect walks; only one FGD was held. Once in the field, it was difficult for the evaluator to find beneficiaries that were either available or willing to talk about FORECCSA.

Recommendation: Allow more time to find participants and triangulate findings.

Additional Lessons and Recommendations from the Pilot

For Implementing Entities

Lesson Learned: It was difficult to find information about the project during the ex post evaluation. Given the quantity of information generated, a better knowledge management system would also encourage greater use and utility of the project data, which would benefit ongoing and future interventions.

Recommendation: Improve data and knowledge management. The IE should systematically store and safeguard information after project closure for ex post purposes and to capitalize on the lessons and information collected during the project lifecycle.

For the Adaptation Fund

Lesson Learned: While valuable sources of information, final evaluation reports were not a sufficient base for the ex post evaluation. The results framework, as evaluated, did not allow a proper evaluation of outcomes for post completion, nor did it provide sufficient data or information about possible characteristics of sustainability.

Recommendation: The Fund should consider requiring its IEs to (1) demonstrate systematization and storage of the project information at completion; and (2) prepare information in a way that it is usable or easily accessible at ex post, should the Board request an ex post evaluation. For instance, the IE should make and maintain lists of surveys or participants in activities.

For the AF-TERG on methods

Lesson Learned: The training materials were available only in English, which slowed uptake and communication during the sessions. Following the training, it was difficult to identify and communicate with key informants at the local level.

Recommendation: Provide future capacity-building processes for ex post evaluation and training material in the primary/official language of the country hosting the project. These measures will help increase understanding of the innovative concepts involved and AF-TERG working methods.

Recommendation: Strengthen or identify local partners with the IE ahead of the ex post evaluation. This would strengthen the quality of findings and help prepare ex post fieldwork.

Annex III. RESILIENCE ANALYSIS FRAMEWORK

Phase one of the ex post evaluations developed an innovative framework to assess climate resilience, as it is one of the ultimate goals of climate change adaptation. This area is pivotal to climate change adaptation yet has rarely been measured.

The resilience analysis framework covers five components:

(i) The climate disturbances (shocks and stresses)

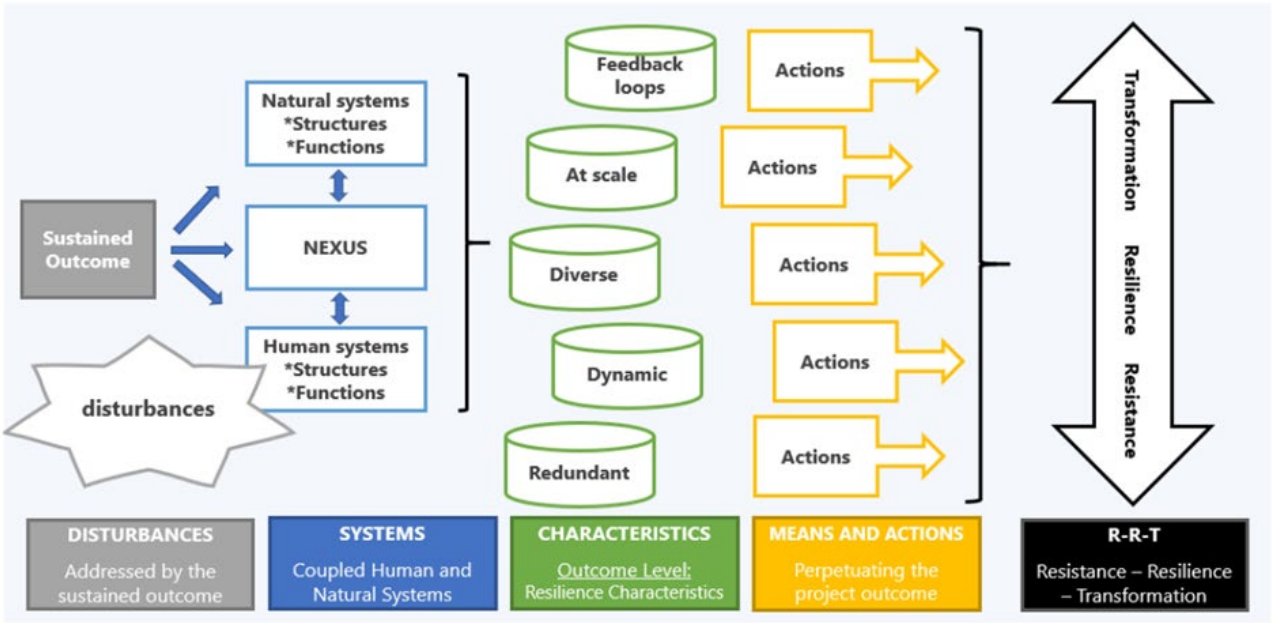
(ii) The human and natural systems (and their nexus) affected by and affecting project outcomes

(iii) The characteristics of resilience in the outcomes

(iv) The means and actions supporting outcomes (exemplifying characteristics of resilience)

(v) A typology of resistance-resilience-transformation (R-R-T) into which the overall project can be mapped based on how actions are designed to maintain or change existing structures and functions.

Figure 1. Understand ex post resilience: framing for resilience analysis



Within this structure, two analytical frameworks were suggested for use in ex post evaluations of Fund projects:

- **Resilience characteristics**: The first framework provides a set of characteristics that may be inherent to sustained outcomes to support resilience to climate disturbances. Five characteristics can be displayed by sustained outcomes in both human and natural systems, indicating how and in what ways the sustained outcomes contribute to resilience:

    - **Redundancy** (Creating a duplicate or back-up system to support resilience to climate disturbances if/when one option fails)

    - **Diversity** (Reflecting a wide and deep variety of actors and inputs working towards common goals in complexity and climate resilience)

    - **At Scale** (Providing the temporal or spatial scale needed for natural and/or human systems to maintain or change their functions and/or structures in the face of climate disturbances)

    - **Dynamism** (Demonstrating flexibility – around an equilibrium – in approach and strategy towards reaching common objectives)

    - **Continuous Feedback Loops** (Supporting communication lines, access to information or partnerships for sustainability of outcomes)

- **Resistance-Resilience-Transformation (R-R-T) Typology of adaptation actions**: The second framework can be used to categorize adaptation actions that support or bolster assets and capacities for resilience, and beyond. The R-R-T typology focuses on whether actors are passively or actively maintaining structures and functions (resistance), or whether they are seeking to fundamentally overhaul structures and functions in light of climate disturbances (accelerated transformation). At ex post, the typology allows to define where the ex post asset(s) outcome could fall, both individually and collectively. The outcome is assessed on an action-based spectrum, of six scales (Figure 2):

    - **Accelerated transformation**

    - **Directed transformation**

    - **Autonomous transformation**

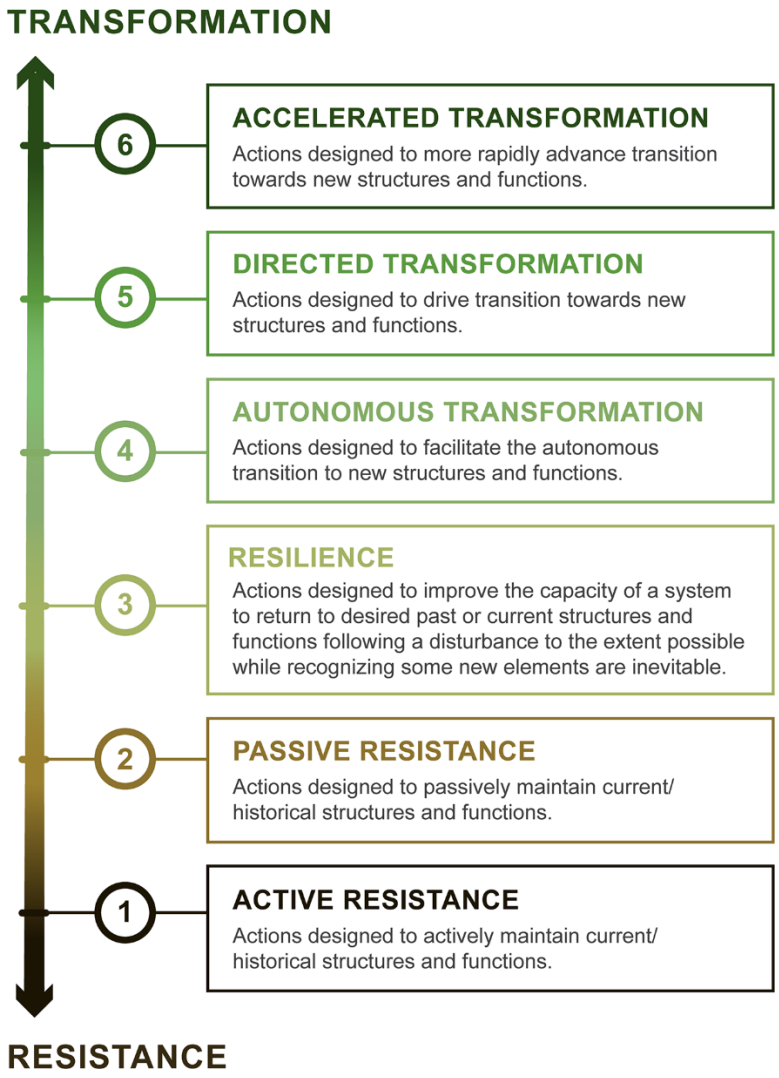
    - **Resilience**

    - **Passive resistance**

    - **Active resistance**

Resilience, the third scale, can be seen as "actions designed to improve the capacity of a system to return to desired past of current structures and functions following a disturbance to the extent possible while recognizing some new elements are inevitable."

Figure 2. Resistance - Resilience - Transformation (R-R-T scale)



Source: Peterson St-Laurent, G., Oakes, L.E., Cross, M. et al., 2021.[19]

[19] Peterson St-Laurent, G., Oakes, L.E., Cross, M. et al. (2021). R-R-T (resistance-resilience-transformation) typology reveals differential conservation approaches across ecosystems and time. Communications Biology 4, 39. Available at: https://doi.org/10.1038/s42003-020-01556-2