Cook Islands Final Report

Appendix 1 - Economic valuation of Muri Lagoon

Table A1.1. Willingness to pay survey card

Water quality improvement for ecological health		
Low	Medium	High
Pollutant and sediment load remain unchanged at about 2 times the expected standard without any additional action.	Pollutant and sediment load is moderately reduced to approximately 1.5 times the expected standard by controlling pollutants and sediments entering the water body.	Pollutant and sediment load is significantly reduced to the expected standard by controlling pollutants and sediments entering the water body and removing pollutants from the system.
Water quality improvement for public health		
Low	Medium	High
Bacterial load remains unchanged at about 3.7 times the expected standard without any additional action.	Bacterial load is moderately reduced to approximately 2.5 times the expected standard by sanitation system upgrade and compliance.	Bacterial load is reduced to the expected standard by implementing a modern integrated wastewater system for wider coverage.
Aquatic biodiversity condition		
Declining	Maintain	Restore
The current decline in marine biodiversity, both in terms of abundance and diversity, remains unchanged.	Prevent further loss and maintain the current low levels of marine biodiversity in terms of abundance and diversity.	Restore marine biodiversity to its higher past levels of abundance and diversity.
Traditional marine environmental management practices		
Low	Medium	High

Ra'ui are established. But, monitoring and enforcement is unclear.	Ra'ui are established, lifted, and adapted as needed. + Ra'ui are well communicated, there is good awareness of ra'ui among residents and tourists.	Ra'ui are established, lifted, and adapted as needed. + Ra'ui are well communicated, there is good awareness of ra'ui among residents and tourists. + Ra'ui are regularly enforced and monitored by traditional leaders and community.
Number of Tourists		
Reduce	Maintain	Increase
Reduce the number of tourists visiting the Muri Lagoon by about 20% through various measures (e.g., access restrictions)	Maintain the number of tourists visiting the Muri Lagoon at the current level	Increase the number of tourists visiting the Muri Lagoon by about 20% through various measures (e.g., promotional activities)

Appendix 2 - InVEST models and methods

InVEST Workbench 3.14.2 was used for all modeling. Three ecosystem service models and one additional tool were used: Nutrient Delivery Ratio (NDR), Sediment Delivery Ratio (SDR), Urban Flood Risk (UFR) and DelineateIt (for delineating watersheds).

1/ Modeling data

Following are the data sources used for modeling and scenario creation. For more detail about the sources, and how the data were processed, see the methods documents referenced in the next section.

Table A2.1. Data inputs for the natural capital assessment

Input	Source	Used for
Land use/land cover	Cook Islands National Environment Service, Rarotonga Land use 2009.	nutrient, sediment, flood risk, scenarios
Digital elevation model (DEM)	NASA ASTER GDEM, via the Cook Islands Environment Data Portal	nutrient, sediment
Watersheds	Generated from the DEM using InVEST DelineateIt	nutrient, sediment, flood risk
Rainfall erosivity	Calculated from WorldClim historical data using the Bohl method for Java	sediment
Soil erodibility	Calculated from ISRIC Soil Grids data using the Williams 1995 method	sediment
Precipitation	WorldClim historical data	nutrient
Hydrologic soil groups	Custom created from a soil map of Rarotonga and descriptive soil report from Leslie 1980	flood risk
Biophysical table parameters	See the following documents for full references: sediment, nutrient, flood risk	nutrient, sediment, flood risk
Threshold flow accumulation	Value: 50 pixels, to create a modeled stream network that is close to the real	nutrient and sediment stream

	network	creation
Sediment global parameters	Default values - Borselli K: 2; Maximum SDR: 0.8; Borselli IC0: 0.5; Maximum L: 122	sediment
Nutrient global parameters	Subsurface critical length and maximum retention efficiency: both 0; Borselli K: 2	nutrient
Flood global parameters	Rainfall depth: 100mm (used as an example)	flood risk
Buildings in Muri watersheds	Open Street Map, via Cook Islands Environment Data Portal	nutrient wastewater scenario

Input datasets were provided to partners for all models, as well as scenario creation, which can be accessed with the following links:

- Nutrient data
- Sediment data
- Flood Risk data
- Scenario data

2/ Modeling methods

Detailed technical methods were provided to partners for all models, as well as how the two scenarios were created. They can be accessed with the following links:

- Nutrient methods
- Sediment methods
- Flood Risk methods
- Scenario creation methods

3/ Additional modeling results

Table A2.2 Summary of the change in runoff *retention* provided by each of the 5 different land use types that were converted to forest under a riparian restoration scenario, within the watersheds that drain to Muri Lagoon.

Land use (restored to forest)	Total change in runoff retention (m^3)	Mean change in runoff retention (m^3/hectare)
agriculture	4908.3	92.3
livestock	92.1	78.7
residential	3713.4	68.9
transition (residential)	4487.2	94.1
urban	2013.1	133.1

Table A2.3: Modeled freshwater runoff volume, nitrogen and sediment load exports from the 5 largest streams draining into Muri Lagoon (west west to East). Results are shown for 1/ Current (2009) land use conditions, 2/ A scenario where riparian areas have been restored to forest, 3/ Percent change in export between current conditions and riparian restoration, and 4/ from septic systems.

Watersheds	Parengaru	Angatiare	Vai Te Renga	Avana	Turangi
Runoff volume current land use (m3)	29,355	17,168	22,015	198,171	86,208
Runoff volume riparian restoration (m3)	27,173	14,082	19507	194,991	81,950
Change in runoff (m3)	-2182	-3086	-2508	-3180	-425
Change in runoff (%)	-7.4%	-18%	-11.4%	-1.6%	-4.9%
Nitrogen export current land use (kg/year)[1]	57.8	58.3	58.7	264.9	147.9
Nitrogen export riparian restoration (kg/year)[2]	41.0	31.0	37.2	239.8	112.7

Percent change in nitrogen export[3]	-29.1%	-46.7%	-36.7%	-9.5%	-23.8%
Nitrogen export septic systems (kg/year)[4]	774.8	1,966.8	1,579.4	372.5	1,192.0
Sediment export current land use (tons/year)[1]	8.7	17.6	18.7	51.6	41.4
Sediment export riparian restoration (tons/year)[2]	4.0	6.2	7.4	27.3	13.7
Percent change in sediment export[3]	-54%	-64.7%	-60.2%	-47.1%	-66.8%

Appendix 3 - Worksheet: Guide to apply Natural Capital Approaches

Each group fills out the worksheet, tailoring it to their project. The completed worksheets will serve as a blueprint for actual implementation after the workshop.

Part 1. Designing a Natural Capital Assessment

Activity Name: "Integrating Natural Capital Assessment into Project Design"

Objective:
Guide participants through the process of scoping a natural capital assessment to identify opportunities for embedding these approaches into a specific project by mapping ecosystem benefits, stakeholders, and decision points.

Duration: 75 minutes

- **Team name and members:**

____

____

____

- **Project Name and Location:**

____

____

____

1. SCOPE ASSESSMENT: Identify Key Natural Capital Components (20min)

- **Project Context and Challenges:** (What are the challenges that natural capital approaches can help address?)

- **Assessment Goal:** (What decision will this assessment inform?)
  - Example: "To assess the economic value of mangroves for coastal protection in Belize to inform policy and investment decisions."
  - Write one sentence objective

- **What are the potential solutions (e.g., scenarios) to address the challenges at hand?**

- **Which natural assets/ecosystems are being assessed?**
  - ☐ Forests
  - ☐ Wetlands
  - ☐ Mangroves
  - ☐ Seagrass

- ☐ Coral Reefs
- ☐ Other: _______________

- **What ecosystem services are being evaluated?** (Check all that apply)
  - ☐ Carbon sequestration
  - ☐ Coastal protection
  - ☐ Fisheries
  - ☐ Tourism and recreation
  - ☐ Water quality regulation
  - ☐ Livelihoods
  - ☐ Cultural identity
  - ☐ Other: _______________

- **Who are the key stakeholders (beneficiaries) or collaborators?**

  Government agencies:

  ____

  ____

  ____

  Local communities:

  ____

  ____

  ____

  Private sector:

  ____

  ____

  ____

  NGOs/Research institutions:

  ____

  ____

  ____

2. SCOPE ACTIVITIES & TIMELINE (20 minutes)

Activity	Description	Write down your thoughts and how long do you think it will take to conduct these activities (e.g., 1 month, 6 months, 1 year)?
Data Collection	What data/information exists or is needed? Identify key datasets (e.g., land cover, biodiversity, economic values).	
Stakeholder Engagement	Who do you engage with and when? (e.g., communities, agencies, and experts)	

Methods and Valuation approaches	For example: Use GIS tools, models (e.g., InVEST), economic valuation to quantify and value ecosystem services.	
Policy or Finance Integration	How will the assessment results be integrated into a decision's context? (e.g., policy or finance)	
Communication & Reporting	How will the goals and findings be communicated throughout the	

	project with different actors? (e.g., reports, policy fact sheets, visual dashboards, movies).	

3. SCOPE CHALLENGES & OPPORTUNITIES (15 minutes)

- **What challenges might arise in conducting the assessment?**

- **What existing or new partnerships could help solve these challenges?**

- **What capacity-building or training may be needed?**

Part 2. Designing a Finance Mechanism

Activity Name: "Turning Willingness To Pay into Action: Designing a Sustainable Finance Mechanism"

Objective:
Building on this morning activity, consider the potential management solutions we analyzed as part of the natural capital assessment and the economic valuation results of the Muri Lagoon. How would you design a finance mechanism to fund the implementation of those solutions?

In this activity, you will go through the process of using willingness-to-pay (WTP) survey results to design a viable finance mechanism for sustainable ridge-to-reef management.

Duration: 75 minutes

---

1. SCOPE A FINANCE MECHANISM FOR A POLICY/MANAGEMENT SOLUTION:

a. Choose one solution for improving marine water quality as the focus of your finance mechanism:

1. Watershed management (e.g., restoring vegetation, education program)
2. Water treatment plant

b. What is the goal of your proposed finance mechanism? Think about various approaches that could be used, such as increasing financial capital, incentivizing positive actions, or discouraging harmful practices *(ex: co-finance water treatment, fund habitat restoration, incentivize reduced pesticide use)*

____

____

____

c. What is the scale of the mechanism? *(Local, subnational, regional, international, etc.)*

____

d. Who are the key stakeholders involved? *(Consider people who contribute to the mechanism as well as people who benefit from the mechanism)*

____

____

____

2. DESIGN FINANCE MECHANISM:

a. Fundraising & Revenue Estimation

- **Primary Funding Mechanism:**
  - ☐ Tourist Conservation Fee
  - ☐ Recreational User Fee (e.g., diving/snorkeling)
  - ☐ Business Contribution (hotels, tour operators)
  - ☐ Water Bill Fee (residents, businesses)
  - ☐ Government-Backed Environmental Levy
  - ☐ Other: _______________
- **Who Pays?** (Check all that apply)
  - ☐ International Tourists
  - ☐ Domestic Tourists
  - ☐ Local Businesses
  - ☐ Residents
  - ☐ Government Agencies
  - ☐ Other: _______________
- **Estimated Revenue Potential (Use WTP Data)**

- **Total potential payers: ____________**

  Example:

  - Residents (~13,000 people in Rarotonga)
  - Tourists (~160,000 visitors annually)

- **Average WTP per person using the ADB's WTP survey**:
  - ☐ $100
  - ☐ $200
  - ☐ $300

- **Projected total revenue per year:** $__________

  Tip: Total Willingness to Pay Revenue = (# people × WTP)

b. Collection & Implementation Strategy

- **How will the fee be collected?** (Choose one or more)
  - ☐ Added to hotel bookings (tourism tax)
  - ☐ Collected at airports/entry points
  - ☐ Included in MPA entry fees
  - ☐ Collected through the water bills
  - ☐ Integrated into tour operator fees
  - ☐ Other: ______________
- **Who will oversee fund collection & management?**
  - ☐ Government Agency (e.g., Ministry of Environment)
  - ☐ Conservation Trust Fund (e.g., Public-Private Partnership)
  - ☐ NGO-Led Fund Management
  - ☐ Community-Based Organization
  - ☐ Other: ______________

c. Fund Allocation & Beneficiaries

- **How will the revenue be used?** (Check all that apply)
  - ☐ Terrestrial and/or Marine Habitat Protection & Restoration

- ☐ Fisheries & Marine Resource Management
  - ☐ Climate Adaptation Projects (reduce flooding risk)
  - ☐ Local Livelihood Support
  - ☐ Research & Monitoring
  - ☐ Other: _______________
- **Who will benefit from this mechanism?**
  - ☐ Local Coastal Communities
  - ☐ Small-Scale Fishers
  - ☐ Government Agencies (for ecosystem protection)
  - ☐ Tour Operators & Business Owners
  - ☐ Tourists
  - ☐ Other: _______________

d. Challenges & Risk Mitigation

- **Potential Challenges** (Check all that apply)
  - ☐ Resistance from tourists or businesses
  - ☐ Difficulty in enforcing fee collection
  - ☐ Lack of trust in fund management
  - ☐ Political or legal barriers
  - ☐ Other: _______________
- **How will these challenges be addressed?**
  - Example: Transparent fund management with community oversight
  - Example: Public awareness campaign on why the fee matters

____

____

____

3. FINAL PITCH AND JUSTIFICATION

- **Choose a name for your mechanism:**

____

- **Write a sentence that briefly describe the mechanism and its purpose (e.g., *Visitors pay $8 to enter the protected area via a payment booth administered by the park system*):**

____
____
____
____

- **Write one sentence on why this is the best mechanism for this project?**

____
____
____
____

- **Briefly describe who is paying, the intermediary actors managing the funds, and who will benefit from this mechanism directly (and indirectly)?**

____
____
____
____

Appendix 4 - Example of Terms of References for a Natural Capital Specialist

1. Background & objectives

This section is optional. If you decide to include it, this section would be a summary of what the overall project goal is and what are the specific objectives of the consultancy.

2. Scope of work

This section lists the tasks that need to be accomplished during the lifetime of the project. For instance, a Natural Capital Specialist will:

- Identify interlinkages among natural capital, ecosystem services and development in the context of [*country/region/watershed*].
- Develop a framework for environmental accounting and make practical recommendations in enhancing natural capital investment.
- Ensure effective communication, coordination and timely delivery of high-quality outputs satisfactory to ADB's requirements.

The Natural Capital Specialist will submit a progress report within the last week of each phase, to summarize current progress and update work plans as required.

The Natural Capital Specialist will undertake the following tasks:

- Communicate and coordinate in a timely manner with ADB, local partners and the consultant team on all issues related to implementing the assigned tasks, to ensure high-quality and on-time accomplishment of all planned activities.
- Coordinate with ADB and other international and national consultants to align work plans and proposed outputs, and to avoid possible mismatching or overlapping, consistency, and cohesion of activity outputs, and to satisfy all ADB's requirements.
- Consultant will support ADB with preparing terms of reference, reviewing consultants' qualifications, and making recommendations on final selection of consultants to fill these roles. Consultant will also support ADB with reviewing consultant's products and providing overall quality assurance.
- Identify linkages between natural capital investments, changes in natural capital and nature's benefits to people, and key development goals, within the context of DMCs.
- Establish a baseline assessment in one pilot country for 3-4 priority ecosystem services to be identified through scoping with pilot country leaders. Potential focal themes and metrics to be scoped for inclusion in an integrated framework

depicting linkages between natural capital investments include climate change, poverty reduction, biodiversity, environmental protection, food security, nutrition balance, resource management, gender equality and development inclusiveness/sustainability.
- Deliver a knowledge product (slide deck--about 30 pages; with short narrative executive summary) on “Managing Natural Capital for Climate Change Adaptation and Inclusive Growth”, including a review of policy and finance mechanisms such as PES, eco-compensation schemes, zoning, etc
- Scope and develop training sessions and present findings and recommendations on “Solutions and Technologies for safeguarding Natural Capital” with at least 36 high-quality PPT slides (for about 2 hours).

3. Qualifications

The Natural Capital Specialist must have the following qualifications:
- University degree (Master in Science or higher) in natural capital/environmental sciences or related fields;
- At least 10 years of experience in the field of institutional development, strategy development, natural resources management, science and/or policy, preferably in Asia and the Pacific;
- With experience in international organization and working in a team setting, ensuring effective communication and coordination and timely delivery of high-quality outputs.

4. Time commitment and/or timeline

To be defined by the project

5. Deliverables (or Expected Outputs)

This section shows a separate list of tangible deliverables/outputs expected from the consultant w timeline. For instance, the following can be typical deliverables in a natural capital assessment project:

1. Technical report on baseline assessment of 3-4 ecosystem services in one pilot country - 9 months after project start
2. Slide deck with short narrative executive summary on “Managing Natural Capital for Climate Change Adaptation and Inclusive Growth" - 12 months after project start

3. Deliver training session(s) and recommendations on “Solutions and Technologies for safeguarding Natural Capital” - within 12 months of project start

6. Proposed contract arrangement

Remote, in person, hybrid

Appendix 5 - Project cycle entry points for Natural Capital Assessment and Accounting approaches

Appendix 5 was developed based on discussions between representatives of the Stanford Natural Capital Project (Anne Guerry and Jade Delevaux) and the Asian Development Bank (Suzanne Robertson, Martino Pelli, and Kristina Katich) in Rarotonga on 6 March 2024.

1/ Country Partnership Strategy (CPS)

The CPS guides ADB's work in each developing member country (DMCs). The CPS is aligned with the country's development plan and poverty reduction goals. ADB conducts thematic and sector analyses and assessment studies in preparation for a new CPS every 5 years. ADB has seven core sectors: (1) Agriculture, Food, Nature & Rural Development (2) Energy (3) Finance (4) Human & Social Development (5) Public Sector Management & Governance (6) Transport (7) Water & Urban Development. This document is developed in close collaboration with the government and other country stakeholders including civil society, non-government organizations, private sector, as well as the country's other development partners. It is a 15 page document written by ADB and approved by the government. The CPS is implemented through the country operations business plan.

The CPS document is developed over the course of the first year and sets the objectives for the subsequent 4 years, providing a snapshot of the country and core areas of work to be undertaken. In year 2, the mid-term review commences and assesses the achievement and accomplishments of the country in relation to the CPS. In year 5, the final review occurs and informs the CPS for the following 5 years. Inclusive and Sustainable growth Assessment (ISGA) is an attachment to the CPS and is another document that needs to have an environment, which includes natural capital, incorporated into the overall scope of work and assessments within the CPS.

1.1/ Embedding natural capital into environmental assessment framework

Around the world, nature's benefits are fundamental to food and water security, poverty reduction, mental and physical health, and sustainable development. Natural capital refers to the world's stocks of natural assets which include diverse ecosystems from coral reefs to wetlands to forests, soil, air, water, and all living things. Currently ADB is working to incorporate environmental assessment into the CPS more fully. Natural capital assessments could be paired with environmental assessment and included within this framework–with a particular focus on climate change and nature-based solutions.

1.2/ Cook Islands Country Partnership Strategy (CPS)

The Cook Islands does not have an individual CPS but is instead grouped with 11 other pacific island countries (PIC-12) in a document titled Pacific Approach, 2021-2025. The Pacific Approach acts as the CPS for the PIC-12, including the Cook Islands. This document references environmental sustainability. However, there is an opportunity to be more specific about ecosystem services, perhaps in the next edition.

2/ Country Programming

A country programming meeting takes place annually to develop and select a pipeline of projects in the form of a Memorandum of Understanding. In some cases countries provide an initial project list and for others, the list is co-developed with ADB. The project pipeline could be broadened through workshops or training to give countries ideas for natural capital projects that could be embedded into programming. This may be more feasible for countries that need support to develop the project pipeline. This engagement would build upon the CPS and identify projects that provide integrated solutions to challenges.

2.1/ Accounting for natural capital into country diagnostic studies

ADB aims to support the development goals and poverty reduction strategies of its DMCs. Country diagnostic studies aim to diagnose the constraints that a DMC faces to achieve these goals. However, ADB recognizes that DMCs may need capacity development to strengthen their planning processes and capability to diagnose their barriers. There are three types of financial support that DMCs can access based on their classification, which reflects their development outlook, including debt ratios: C = Ordinary loans; B = Concessional loans, which have a better rate, and can be blended with Technical Assistance (TA) grants support (e.g., the Cook islands). A = Grants only from the Asian Development Fund (ADF) (e.g., Tuvalu). The main implication of the country diagnostic is that it affects the type and amount of financing that governments may be able to access to financing proposed NbS projects.

A country diagnostic is another document where natural capital approaches (NCA) can serve as a baseline and used to identify a pipeline of projects that need funds. A measure of natural capital at the national scale, such as natural capital accounting in the form of a Gross Environment Product (GEP) or applying the UN-SEEA framework or

GOAP approach, could be considered when classifying a country for loans. Natural capital accounts track current stocks of natural capital and their change over time using a standardized, replicable approach for designing and evaluating policies and investments. Tracking changes in ecosystems and the flows of ecosystem services can inform diverse policy and finance decisions by providing nationally- or regionally-aggregated information in ways that support long-term evaluation of progress toward conservation and other goals.

If natural capital approaches can show that there is value in doing environmental projects or environmental components of projects, it is easier to make the argument. For instance, if Nepal is considering how to finance a transport–wildlife overpass and cannot prove that there is monetary value in doing it. It is the first thing that will get cut.

2.2/ Cook Islands Programming

The annual meeting of the ADB board of directors took place at the end of April 2024. There is a need and desire to quantify environmental benefits to inform the design and siting of nature-based solutions.

3/ Project design

Based on the annual Country Programming meeting with the country, projects are designed through the form of concept notes. Upstream and midstream of the project pipeline results in decisions of where to work and downstream of the pipeline is where projects are processed for implementation.

3.1/ Cook Islands Project 53075-001: Climate-adapted Communities for Environmental Improvement Sector Project

The ADB project officer is Kristina Katich. The proposed Climate-adapted Communities for Environmental Improvement Sector Project (CCEI-SP) is still early in the project planning process and there is an opportunity for input to the project concept note, currently under development. The government aims to improve the water quality of Muri Lagoon in Rarotonga and improve water supply and sanitation services nation-wide. To meet this aim, the former Muri Sanitation Project will (i) change to a sector project modality; (ii) expand the possible project areas to include other areas of Rarotonga, Aitutaki, and the Pa Enua; and (iii) broaden scope to include water supply, sanitation, and flood management. The proposed primary project will focus on flood management Muri Catchment area, and potential sub projects include (i) a feasibility study for desalination and water security in Aitutaki, (ii) sanitation improvements on Rarotonga (both onsite and centralized), (iii) improved water supply and sanitation in the Pa Enua, (iv) continued improvement of WASH in schools and (v) irrigation for small-scale agriculture. GHG is already engaged to deliver: (i) feasibility studies, (ii) review/development of sector policies, laws, and regulations, and (iii) project due diligence. Due to the revised project modality and scope, government and ADB are revising GHG's TOR to prepare (i) a sector development plan; (ii) due diligence for flood management in the Muri Catchment area, with a focus on using nature-based solutions and incorporating natural capital assessment findings. The revised project scope will provide a holistic approach to improving the water quality of Muri Lagoon and ocean health while creating climate-adapted water and sanitation solutions. Opportunities to utilize nature-based solutions will be encouraged in the preliminary designs. The project team will seek ADF14 thematic grants to fund the primary project, and potential co-financing from the GEF Special Climate Change Fund (SCCF) may be sought.

Kristina Katich is seeking input to develop the project concept note for the CCEI-SP. With input from Stanford NatCap, natural capital approaches could be included in this document to set the stage for integration throughout the project cycle.

3.2/ Cost-benefit analysis (CBA)

The assessment of every project includes a CBA. Currently, ecosystem services are included as part of the CBA only in some of the projects that are specifically tagged "environment", for every other project, ecosystem services are only considered as part of safeguard policies. In the future, the value of ecosystem services should form an integral part of the CBA for every project. Environmental safeguards would just aim to ensure that the project does not harm the environment. Ideally, this would take place at the concept stage of the process but it is data intensive and costly. Martino Pelli (ADB) is leading the effort of the Economic Research and Development IMpact (ERDI) Department to develop tools using artificial intelligence to help inform an ecosystem service-informed CBA at the concept stage. ADB is currently testing a prototype of said tools in a project in China. ADB is also planning to develop a biodiversity risk assessment tool using a top-down approach. Currently, ADB uses a 9% discount rate for projects. Since most environmental benefits are situated further down the road, they are heavily penalized by this discount rate. There is a need to revise the value of nature into the future, especially for the next generation.

3.2.2/ Cook Islands Cost-benefit analysis (CBA)

A CBA does not currently exist for the proposed CCEI-SP. Martino Pelli and his team is currently working on doing a monetary valuation of health (reduce exposure to infectious diseases), amenities, water quality for biodiversity, recreation for local communities, and tourist attraction for foreign visitors.

3.3/ Assessing natural capital at the project scale

Natural capital assessments quantify and map both natural capital stocks (e.g., water-purifying wetlands) and the ecosystem services flowing to people (e.g., safe drinking water). The result is a specific value for these services (a monetary value, like avoided water treatment costs, a biophysical metric like amount of nutrient pollution removed from water, or a social value like number of people affected). The monetary valuation can be explicitly linked to the CBA described above. Mapping allows decision-makers to strategically manage their natural capital stocks and prioritize the most beneficial locations to preserve, restore, or sustainably use the services they provide. Using InVEST or GIS-based methods, natural capital approaches are spatially scalable, spanning multi-national to local assessments. Assessments typically involve:

- Deciding what types of ecosystem services to quantify (including benefits to specific sectors or communities), and where (within a specific region, whole country, etc) through a science-policy engagement process with diverse interests
- Gathering data about land and water use, habitat cover, key physical assets (e.g., roads, hospitals, homes, and other infrastructure) and management practices for the area of interest.
- Modeling the ecosystem services currently provided (InVEST®, the Natural Capital Project's suite of free, open-source software tools, currently includes 20 ecosystem service models).
- If desired, developing alternative future management and climate scenarios and projecting changes in benefits to different sectors, livelihoods, and local cultures, or examining benefits of investments in ecosystems. The results from this science-policy process can be used to build common understanding and inform policy, management, and finance decisions, including optimizations under fixed budgets.

3.3.1/ Natural capital assessment of Muri

The Natural capital project is leading a NCA for the Muri area. The NCA focuses on quantifying and mapping sediment retention, nutrient retention, and flood risk mitigation benefits provided by natural capital on land. This assessment will help inform when vegetation cover is important to be maintained or restored to help mitigate flood risk or restore water quality. This is an opportunity to integrate the NCA and CBA to quantify the potential benefits of reduced flood mitigation and improved water quality in Muri Lagoon.

3.4/ Capacity development

Capacity development, such as workshops and training, on natural capital provide an opportunity to ADB and the DMCs to expand discussions around key issues and solutions. New ideas and innovative strategies could be designed and pave a new way forward that centers nature into development.

4/ Project implementation

ADB-assisted projects are implemented by the executing agency according to the agreed schedules and procedures. ADB requires the borrower to submit regular safeguards monitoring reports, in addition to progress reports. This process could be modified to explicitly account for and monitor natural capital (habitats etc.) and/or ecosystem services during the course of a project.

4.1/ Safeguards

Currently ecosystem services are included as part of project safeguards. ADB's safeguard policy aims to help DMCs address environmental and social risks in development projects and minimize and mitigate, if not avoid, adverse project impacts on people and the environment.
For example, some commercial banks have already introduced voluntary internal policies that prevent lending to projects that would damage Ramsar Wetlands (IUCN 2014). These policies can expand to new areas, such as unprotected mangroves. These types of safeguards often apply to new lending and require ongoing monitoring, for example by working with independent standard setters and verification bodies.

Stanford NatCap could work with ADB to define ecosystem service indicators and assessment methods as part of the existing 'safeguards' monitoring reports. Leveraging the natural capital assessment and who the beneficiaries are to incorporate them in the safeguards. Alternatively, this process could be modified to explicitly account for and monitor ecosystem services during the course of a project.

5/ Project evaluation

The borrower is obligated to provide ADB with a Project Completion Reports (PCR), which informs a PCR drafted by the ADB project team. The Independent Evaluation Department (IED) in ADB, which are not part of country nor loan teams and they report directly to the board, reviews the PCR. IED monitors, reports, and verifies (MRV) a suite of Key Performance Indicators. IED may choose to perform an additional review up to 7 years later.