TOOL FOR INTEGRATING ECOSYSTEMS INTO CLIMATE CHANGE ADAPTATION PLANNING

Linking Biodiversity and Ecosystems into the National Adaptation Planning (NAP) Process

28 September 2015

Draft for Piloting

1 - Introduction to the Tool

The core objective of the tool is to help facilitate an efficient process for consideration of ecosystems within the National Adaptation Planning (NAP) planning process. To achieve this, there are two discrete steps involved in using the tool, which link closely with the UNFCCC's NAP Technical Guidelines. This structure will help a NAP Planning Team to explore the issues relevant to both the current phasing of national government planning and also the government's local policy priorities pertaining to ecosystems and biodiversity.

Step 1 of the tool aims to assist the NAP Planning Team to 'screen' issues and opportunities that link ecosystems and adaptation planning in their local contexts, and discuss options for activities that are consistent with the broad national strategies for ecosystems.

Step 2 of the tool supports a much more detailed assessment of the capacity and information requirements for consideration of ecosystems in the NAP planning process. This step is informed by the results of Step 1, and provides illustrative examples of more specialized tools and guidance to enable the detailed exploration of the activities identified.
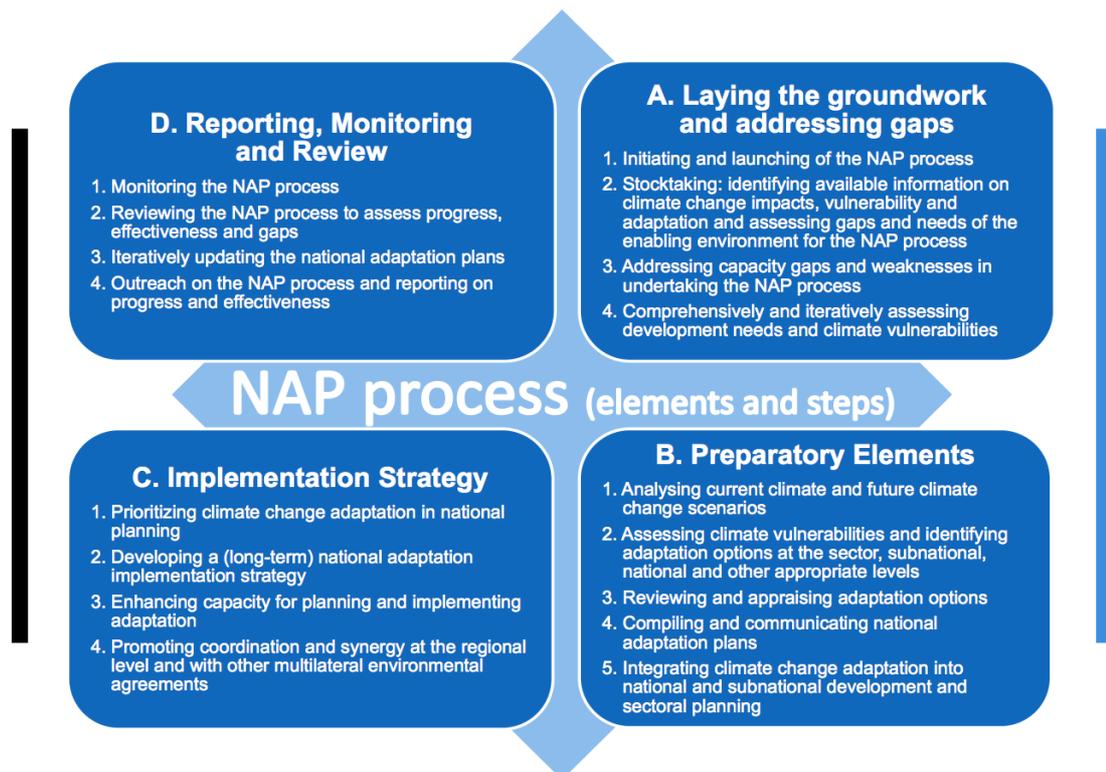
The tool has been developed and refined in close consultation with partners including Birdlife International, International Union for the Conservation of Nature (IUCN), and United Nations Environment Programme (UNEP). The tool was also guided by feedback received at the EbA workshop which took place on 7 June 2015 in Bonn, Germany.

1 - Introduction to the Tool

2 - Overview of the NAP Technical Guidance

The NAP process offers a core planning framework for national adaptation planning which can be supplemented with a range of existing and purpose-built guidance and tools. Sectoral supplements for the NAP are being prepared for agriculture, water and disaster management, but this tool is the first guide that supports consideration of ecosystems across all the relevant steps of the NAP process.

Figure 1 illustrates the four elements and associated steps in the process from the NAP Technical Guidance. The cyclical nature of this figure shows that the emphasis of the planning team should ideally be on the establishment of an ongoing process, and not too focused on individual products.

Figure 1 – Elements and Steps in the NAP Process (UNFCCC Least Developed Countries Working Group)

D. Reporting, Monitoring and Review

1. Monitoring the NAP process
2. Reviewing the NAP process to assess progress, effectiveness and gaps
3. Iteratively updating the national adaptation plans
4. Outreach on the NAP process and reporting on progress and effectiveness

A. Laying the groundwork and addressing gaps

1. Initiating and launching of the NAP process
2. Stocktaking: identifying available information on climate change impacts, vulnerability and adaptation and assessing gaps and needs of the enabling environment for the NAP process
3. Addressing capacity gaps and weaknesses in undertaking the NAP process
4. Comprehensively and iteratively assessing development needs and climate vulnerabilities

NAP process (elements and steps)

C. Implementation Strategy

1. Prioritizing climate change adaptation in national planning
2. Developing a (long-term) national adaptation implementation strategy
3. Enhancing capacity for planning and implementing adaptation
4. Promoting coordination and synergy at the regional level and with other multilateral environmental agreements

B. Preparatory Elements

1. Analysing current climate and future climate change scenarios
2. Assessing climate vulnerabilities and identifying adaptation options at the sector, subnational, national and other appropriate levels
3. Reviewing and appraising adaptation options
4. Compiling and communicating national adaptation plans
5. Integrating climate change adaptation into national and subnational development and sectoral planning

In considering the 17 steps in Figure 1, it is important to note that consideration of ecosystems is more relevant to some steps than others. The following section explores the broad strategies that underpin the activity selection process, which is critical to identifying which elements and steps are relevant in the local context.

3 - Strategic Objectives for Ecosystems in Adaptation Planning

The relationship between ecosystems and climate change adaptation is complex, and the level of effort required for the consideration of opportunities and risks within the NAP planning process is heavily dependent on the objectives and mandate of the NAP Planning Team, as well as the political, socioeconomic, biophysical and cultural contexts.

To clarify potential relationships with other NAP objectives (e.g. sectoral targets, poverty reduction), CI has identified four broad strategic objectives that focus on different parts of the ecosystem-adaptation relationship. These strategies offer useful reference points for consideration of ecosystems within the NAP process. The minimization of negative biodiversity and ecosystem impacts within an adaptation planning process can be referred to as the application of *'environmental safeguards'*, ecosystem and biodiversity conservation within adaptation planning can be called *'adaptation in conservation'*, minimization of negative impacts of climate change on ecosystem service provision can be called *'adaptation for protection of ecosystem services'* and mainstreaming the opportunities in the context of adaptation planning can be described as ecosystem-based approaches to adaptation or *'EbA'*. The four options represent a different emphasis and are described as 'strategic objectives' within the tool. Working towards a specific strategic objective likely involves collaboration in a different operational context with a different emphasis for the NAP Planning Team, as follows:

1. **Safeguards objective:** This involves working across various sectors (such as agriculture or urban development) and the emphasis of the NAP Planning Team will be on ensuring that the ecosystem impacts associated with each adaptation option are considered as per national or local regulatory requirements and/or according to the requirements of the donor organization. This means that the manager will likely be working within a group less familiar with conservation – see Box 1 for an example.
2. **Adaptation of conservation planning objective:** This involves working within the conservation sector and persuading the key stakeholders within this sector to consider the impact of climate change on their plans and operations. The emphasis of the NAP Planning Team will be on linking adaptation issues to available conservation knowledge where relevant, working with conservation practitioners – see Box 2 for an example.
3. **EbA objective:** This involves working across various non-conservation sectors (including engineers and planners) and the emphasis of the NAP Planning Team will be on providing evidence to decision-makers within this sector to consider ecosystem services as a potential solution to human vulnerability – see Box 3 for an example.
4. **Adaptation for protection of ecosystem services objective:** Ecosystem services that are important for local, regional and even global wellbeing and livelihoods may be threatened by climate change and as such, strategies can be established for their adaptation. Note that this is discrete from EbA as the ecosystems are not necessarily providing 'adaptation services' but the NAP Planning Team will be working with an equally diverse group.

The NAP process offers the opportunity to explore the consideration of ecosystems across these four strategic objectives, with the tool utilizing the distinction between these objectives as a core planning consideration. Selecting and/or ranking these strategic objectives is also an excellent opportunity to involve senior decision-makers as such discussions will inform 'downstream decisions' within the NAP Planning Process.

Note that these strategic objectives are not mutually exclusive and efforts in one area may support other objectives. Implementation of each of these strategic objectives can involve specific activities at various steps of the NAP process. The tool supports consideration of these activities.

Box 1 – SAFEGUARD EXAMPLE: Environmental Safeguards in adaptation planning in the Cook Islands

As part of its Joint National Action Plan for Disaster Management and Climate Change Adaptation, the Government of the Cook Islands requires that in all adaptation activities:
- The coastal zone is developed and managed on a more sustainable basis, to take into account the impacts of climate change.
- Environmentally sound, efficient, robust, reliable and safe systems of energy supply in outer islands at al times
- Risks to ground water quality, ecosystem services, and community health eliminated.

http://www.pacificclimatechange.net/components/com_booklibrary/ebooks/JNAP%20-%20FINAL%202012.pdf

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As climate change adaptation is a complex issue with implications that can vary significantly across geographies, sectors and communities, a multi-disciplinary approach is becoming more important in building effective solutions. This creates a particular problem for climate change adaptation planners as this means they are increasingly required to have a level of literacy across a range of relevant fields/sectors or risk the misdirection of resources and/or maladaptation.

Box 2 – ADAPTATION IN CONSERVATION PLANNING EXAMPLE: Applying the National Wildlife Federation's Climate Smart Conservation Guide

The National Wildlife Federation has worked with NOAA's Great Lakes Habitat Restoration Program to include climate change adaptation into their restoration project. For example, the Lower Black River Habitation Restoration project was modified to install fish habitat shelves at several water depths to accommodate the expected greater variability of water flow under climate change as described in the vulnerability assessment.

http://www.nwf.org/What-We-Do/Energy-and-Climate/Climate-Smart-Conservation.aspx

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The integration of environmental issues into climate change adaptation planning adds additional layers of complexity to such planning and strategic objective involves a unique set of considerations. This tool aims to help the NP Planning Team to prioritize areas of capacity building and information gathering related to adaptation in ecosystems by offering a process that is aligned with the phasing of their planning, the strategic objectives for the environment and priority planning activities.

Box 3 – EBA EXAMPLE: Mangrove Restoration in the Verde Island Passage

Work in the Philippines under the German Government's International Climate Initiative (IKI) project was guided by a vulnerability assessment of the Verde Island Passage in 2009, which helped to identify the priority provinces and municipalities to target on the ground activities involving reduction of vulnerability, including through ecosystem services. Complemented by a community-level adaptation planning process and a more detailed coastal assessment tool, a set of mangrove restoration activities were implemented to reduce local vulnerability to storm surge.

http://www.conservation.org/publications/Documents/CI_Ecosystem-based-Adaptation-Vulnerability-Assessment-Philippines.pdf

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4 – Tool Description

STEP 1 - Screening of Objectives

The step can be undertaken in different ways at different times, but the most important output from the process is agreement on a 'shortlist' of activities that will give a strong ecosystem foundation to the NAP. Through this step, the NAP Planning Team will ensure that there are no 'missed opportunities' when it comes to the management of ecosystems and biodiversity. When these activities are selected, the NAP Planning Team may progress to Step 2 to better understand the capacity and information requirements for each 'shortlisted' activity. As a part of Step 2, the team may eliminate any activities that are unrealistic based on capacity or information requirements.

This step links directly to the four elements of the NAP Technical Guidance (i.e. Elements A-D in Figure 1). Each of the following sections corresponds with the four elements and begins with an overview of the element and presents a detailed table which links planning questions to relevant approaches and examples of tools and guidance that illustrate this approach.

Descriptions of the columns for each table are as follows:

Indicative planning questions: These represent likely questions that the NAP planning team is interested in answering as part of the NAP planning process. These questions can be compared with documents that describe the environmental priorities for the government.

Relevant Activities: This is a description of specific activities that can be undertaken that can help to answer the corresponding planning question. These approaches refer back to the four categories of environmental planning within the NAP process, as described in the previous section. Note that each activity is coded (A-O) each of which have a set of information and capacity needs, explored in Step 2.

Examples of Tools and Guidance: To benefit from the extensive global experience in this area, a samples of relevant tools, guidance and case studies are identified, and active links to additional information are provided. Such examples are offered to give the NAP Planning Team a sense of what an activities may 'look like' in practice.

Strategic Objectives: This identifies which of the strategic objectives are relevant to each activity. 1 = Safeguards, 2 = Adaptation in Conservation Planning, 3 = EbA and 4 = Adaptation for protection of ecosystem services.

Where sectoral issues are relevant, sector-specific examples of tools, guidance and/or case studies are offered. For convenience, specific sections or components within the example are highlighted in the table.

Note that inclusion of specific tools and guidance within these tables does not represent endorsement by CI and individual appraisal of relevance and utility in local contexts is recommended.

ELEMENT A: LAYING THE GROUNDWORK AND ADDRESSING GAPS

This element of the NAP process has significant opportunities for consideration of ecosystems and can help to assess the level of interest in exploring such opportunities, based on both regulation (e.g. legal requirements) and aspiration (e.g. policy objectives). What is most important in this element is that the NAP Planning Team has access to technical information and case studies that illustrate where ecosystems have been considered within a planning process so that such examples can be compared with the documents that describe the government's environmental regulation and policy. There are a range of resources which can help with this process, highlighting the conceptual issues that can inform early decisions in the planning process. In terms of the 17 NAP Steps, this is most consistent with Step A1 (*Initiating and Launching the NAP Process)*, but other steps are also relevant)

Options for Consideration of Ecosystems in ELEMENT A

NAP Entry Point	Indicative Planning Questions	Relevant Activities	Examples of Tools and Guidance	Strategic Objectives			
				1	2	3	4
Laying the Groundwork and Addressing Gaps	What emphasis does national policy place on the conservation of specific ecosystems or species, including for ecosystem services?	A - If a review concludes that emphasis is high, include biodiversity, ecosystems and ecosystem services as a sector in the NAP	- The National Wildlife Federation's Climate Smart Conservation Guide (2014) discusses how to integrate adaptation into existing conservation work (Section 2.4).		X		X
	What is the nature of the connection between a sector's importance to the national economy and the health of ecosystems?	B - If connection is likely to be strong, consider environmental aspects within other NAP sectors	Agriculture: - FAO's factsheet on ecosystem services and agriculture is a good conceptual introduction.	X			
			Disaster: UNISDR's Background Paper for the 2015 GAR discusses the policy links betweek ecosystems and disasters. - Disaster: UNEPs Promoting ecosystems for DRR and EbA highlights the relationship between ecosystem services and DRR via case study examples.	X			
			Coastal: - IUCN's Framing Ecosystem-Based Adaptation to Climate Change discusses the relevant ecosystems services in the coastal context and presents a set of case studies.	X			
	Are there any opportunities to reduce vulnerability of people to CC by conserving or restoring ecosystems?	C - Explore opportunities to consider ecosystems as a buffer for human vulnerability	- WWF's Operational Framework for EbA includes an illustration of the foundation elements of EbA.			X	

ELEMENT B: PREPARATORY ELEMENTS

Element B in the NAP process is where a significant amount of analytical work is required. The core focus of this work is typically on a vulnerability and adaptation (V&A) assessment and as there are already many forms of guidance for such assessments, the following table highlights the sections of such guidance that discuss issues relevant to the indicative planning questions.

Options for Consideration of Ecosystems in ELEMENT B

NAP Entry Point	Indicative Planning Questions	Relevant Activities	Examples of Tools and Guidance	Strategic Objectives			
				1	2	3	4
Assessing Climate Vulnerabilities and Identifying Adaptation Options (NAP Element B2)	What is the risk that CC may undermine conservation objectives related to species and/or ecosystems?	D - Characterizing the vulnerability of species to CC.	- Chapter 6 of the National Wildlife Federation's Climate Smart Conservation Guide (2014) discusses approaches and tools for understanding vulnerability in a conservation context.		X		
	What is the risk that CC may undermine objectives related to important ecosystems?	E - Characterizing the vulnerability of ecosystems to CC.	Section 2 of WWF's Operational Framework for EbA describes vulnerability assessments focused on socio-ecological systems.		X		X
	What is the relationship between changes to ecosystems (conservation, restoration, degradation) and human vulnerability to CC?	F - Identifying the role of ecosystems in the vulnerability of people and communities, including their livelihoods.	The PROVIA Guidance for Assessing Vulnerability, Impacts and Adaptation to Climate Change offers a strong framework for the consideration of all relevant issues, including ecosystems.			X	
Reviewing and Appraising Adaptation Options (NAP Element B3)	What are the (EbA and/or non-EbA) adaptation options for reducing human vulnerability and what is their relative value for money?	G - Applying a process for comparing adaptation options in reducing human vulnerability.	A summary of the various economic methods for assessment of adaptation options is present in GWPs Water Supplement to the NAP Technical Guidelines.

Participatory methods are also used extensively to guide adaptation planning decisions, such as the CARE's CVCA and the CRiSTAL screening tool. | | | X | |
| | What are the adaptation options for reducing vulnerability of ecosystems and biodiversity and what is their value relative for money. | H - Applying a process for comparing options for reducing vulnerability of biodiversity/eco systems | Various tools have been developed to assess the value of ecosystems, including the TEEB project and the InVEST software. | | X | | X |
| | What are the likely impacts of adaptation options on ecosystems, biodiversity and people? | I - Applying safeguards that seek to avoid maladaptation associated with environmental degradation or undermining social capital | There are few examples of safeguards specific to adaptation, with some progress made by the AfDB, In addition, guidance and tools that other aspects of development and conservation planning are relevant, including those developed by bilateral and multilateral development donors. | X | | | |

NAP Entry Point	Indicative Planning Questions	Relevant Activities	Examples of Tools and Guidance	1	2	3	4
Integrating climate change adaptation into national and sub-national development and sectoral planning (NAP Element B5)	What is the relationship between local environmental issues, likely climate change and economic sectors dependent on natural resources?	J - Linking adaptation planning with sub-national and sectoral planning. *(All)*	The PROVIA Guidance for Assessing Vulnerability, Impacts and Adaptation to Climate Change offers a strong framework for the consideration of all relevant issues, including ecosystems.	X	X	X	X

ELEMENT C: IMPLEMENTATION STRATEGY

An important part of successful implementation of adaptation planning is the creation of strong linkages with those who are making comparable efforts to reduce their vulnerability to climate change. Through such collaborations, lessons learned can be shared and associated efficiencies can be realized. In addition, like-minded countries could also collaborate to access funding sources; increasingly donors are interested in supporting activities that illustrate global impact.

As would be expected, most of existing networks that link ecosystems and adaptation focus on EbA, but such networks also include information on the other aspects of adaptation planning.

Options for Consideration of Ecosystems in ELEMENT C

NAP Entry Point	Indicative Planning Questions	Relevant Activities	Examples of Tools and Guidance	Strategic Objectives			
				1	2	3	4
Promoting coordination and synergy at the regional level (NAP Element C4)	Are there other countries that may benefit from collaboration and/or have knowledge and experience that may benefit this country (i.e. areas with similar physical and socio-economic contexts)?	K - Linking opportunities and obligations with non-national partners (All)	A useful tool for creating partnerships with non-national partners is the various 'ecosystems in adaptation' online networks and initiative websites. These networks include: - The EbA Community of Practice, which is global but with a strong focus on the Americas. - The EbA Flagship ,which is project oriented but a rich source of information on EbA. Other important regional adaptation networks include: - Africa adapt - Adapt Asia Pacific, which includes a compendium of funds for climate change adaptation. - Pacific Climate Change Portal. Global networks include: - Global Adaptation Network includes material on dissaters and ecosystems. - WeADAPT, includes an ecosystems theme.	X	X	X	X

ELEMENT D: REPORTING, MONITORING AND REVIEW

There are various aspects of performance that can be tracked as part of the planning process, and the main challenge is to utilize limited resources on the tracking of the most useful aspects of this performance; those aspects that inform specific decisions. Typically, performance tracking involves a combination of both monitoring (i.e. continuous assessment of performance against indicators) and evaluation (i.e. event-based assessments of overall performance against planning objectives).

While this is considered to be the final element of the planning process, it is worth noting that M&E is typically a 'weak link' in the planning process: objectives must be clear to enable evaluations, baseline assessments of conditions must be established as early as possible in the planning process to enable effective monitoring.

Options for Consideration of Ecosystems in ELEMENT D

NAP Entry Point	Indicative Planning Questions	Relevant Activities	Examples of Tools and Guidance	Strategic Objectives			
				1	2	3	4
Reporting, Monitoring and Review (NAP Element D)	Consider if there is an EbA option which aims to buffer from extreme events associated with climate variability and more information on effectiveness is desired.	L - Tracking changes in human vulnerability related to response to shock (e.g. storms, droughts)	GIZ's Repository of Adaptation Indicators (2014) has a range of indicator examples that are categorized by focus area and sector and target the national level planning process.			X	
	Consider if there is an EbA option for which incremental changes are expected in quality of ecosystem service delivery and information on effectiveness is desired.	M - Tracking incremental changes in human vulnerability related to ecosystem service changes	CGIAR's Monitoring Instrument for Resilience helps to track the relationship between ecosystem change and human wellbeing.			X	X
	Consider if changes in biodiversity characteristics are expected and information on effectiveness of adaptation options is desired.	N - Tracking changes in biodiversity	The Miradi software system applies the open standards for conservation and offers a database for tracking ecological and biodiversity changes.		X		
	Consider if there have been substantial achievements and/or failures within the planning process that add to the global knowledge of ecosystems in adaptation.	O - Integration of lessons learned	UNEPs Monitoring, Evaluation and Learning Framework for its DRR projects have a strong focus on lessons learned.	X	X	X	X

Checklist – Step 1

Ranking of Strategic Objectives based on government documentation/consultation........☐
Shortlist of Priority Activities for Ecosystems in Adaptation……………………………………....☐

Step 2 – Capacity and Information Assessment

The mix of skills and information that is needed by the NAP Planning Team to inform decisions on integration of ecosystems will be highly dependent on the specific activities that are selected as priorities. This step aims to help adaptation planners to prioritize areas of capacity building and information gathering to enable consideration of ecosystems in the adaptation planning context, thereby finalizing a list of activities so that detailed programming of resources can begin.

From step 1, the NAP Planning Team will have built a shared understanding of the relative priority of the strategic objectives and a 'shortlist' of activities. Step 2 helps to take decisions on which activities will best meet these objectives based on the capacities and information resources available to the team.

The core of the tool is a set of 'cards' that describe these specific capacities and information needs, designed to enable planners to quickly build a basic literacy on the topic, and inform decisions on the allocation of resources – See Annex 3 and 4 for examples of each. By matching their shortlist of activities against the columns in this table, the NAP Planning Team will be directed to the 'cards' that are most consistent with their needs, thereby facilitating their progress to more effective adaptation planning processes and reducing risk of maladaptation.

These cards separate capacity needs from information needs as it may be possible for an organization to build the capacity but not to access the information required to make the best use of that capacity in informing adaptation planning decisions; both are needed.

The decision-support element of this step is represented in the following 'Step 2 Table'. This includes the following fields:

> **Activity Options:** Describes the core opportunities under each entry point in terms of specific actions that could be taken under the NAP process. A shortlist of options was identified in Step 1.

> **Capacity Needs:** Describes broad capacity needs so that they can be considered within any capacity assessment process, with short descriptions of each in Annex 1 and a complete card example in Annex 3.

> I**nformation Needs:** Describes the core information from which the specific option will depend, with short descriptions of each in Annex 2, and example of a complete 'card' example in Annex 4.

The card format was selected as there is value in providing a simple reference with description of the basic options for consideration. This is offered in a way that is not methodologically prescriptive but focuses on highlighting the 'need to know' information associated with each of the capacities and information types so that the implications of any gaps can be understood and actions taken to fill any important gaps.

Step 2 Table: Capacity and Information Needs for Activity Options

Activity Options (from Step 1)	Capacity Needs	Information Needs
A - Including biodiversity, ecosystems and ecosystem services as a sector in the NAP	Conservation policy and planning, Climate policy and planning, Sector policy and planning,	Policy/strategy review
B - Considering ecosystems within other NAP sectors	Sector policy and planning, Climate policy and planning	Policy/strategy review
C - Considering ecosystems as a buffer for human vulnerability	Sector policy and planning, Climate policy and planning, Conservation policy and planning	Climate risk/ vulnerability data for people, Species and ecosystem data, Predicted climate impacts on species and ecosystems, Effectiveness of ecosystems as a buffer for people.
D - Characterizing the vulnerability of species to CC	Climate modeling and downscaling, Impact modeling, species distribution modeling.	Species and ecosystem data, Historical climate data, Predicted climate impacts on species and ecosystems, Drivers of environmental change.
E - Characterizing the vulnerability of ecosystems to CC	Climate modeling and downscaling, impact modeling, Conservation policy and planning	Historical climate data, Species and ecosystem data, Predicted climate impacts on species and ecosystems, Drivers of environmental change.
F - Identifying the role of ecosystems in the vulnerability of people and communities, including their livelihoods.	Climate modeling and downscaling, Impact modeling, Sector-specific policy and planning, Conservation policy and planning, Gender mainstreaming.	Species and ecosystem data, Predicted climate impacts on species and ecosystems, Drivers of environmental change, Human responses to past climate events, Climate risk vulnerability data for people, Effectiveness of ecosystem buffer for people, Projected climate impacts on species and ecosystems,
G - Applying a process for comparing adaptation options in reducing human vulnerability	Climate policy and planning, Environmental economics, Participative decision-making, Ecological engineering, Social science/impact assessment, Gender mainstreaming.	Ecosystem data, Drivers of environmental change, Human responses to past climate events, Climate risk vulnerability data for people, Effectiveness of ecosystem buffer for people, Predicted climate impacts on species and ecosystems, Cost and benefit data.
H - Applying a process for comparing options for reducing vulnerability of biodiversity/ecosystems	Climate policy and planning, Environmental economics, Participative decision-making.	Species and ecosystem data, Predicted climate impacts on species and ecosystems, Drivers of environmental change, Human responses to past climate events, Cost and benefit data.
I - Applying safeguards that seek to avoid maladaptation	Environmental impact assessment, Social science/impact assessment, Gender mainstreaming.	Drivers of environmental change, Climate vulnerability/risk data for people.
J – Linking adaptation planning with sub-national and sectoral planning.	Sector policy and planning, Climate policy and planning, Conservation policy and planning	Policy/strategy review
K – Linking opportunities and obligations with non-national partners.	Sector policy and planning, Climate policy and planning, Conservation policy and planning	Policy/strategy review
L - Tracking changes in human vulnerability related to response to shock (e.g. storms, droughts)	Monitoring and evaluation, Social science/impact assessment, Disaster management	Policy/strategy review, Climate risk/ vulnerability data for people.
M - Tracking incremental changes in human vulnerability related to	Monitoring and evaluation, Social science/impact assessment, Ecological monitoring.	Policy/strategy review, Predicted climate impacts on species and ecosystems, Climate vulnerability data for people.

ecosystem service changes		
N - Tracking changes in biodiversity	Monitoring and evaluation, Conservation policy and planning, Environmental monitoring.	Species and ecosystem data, Policy/strategy review, Drivers of environmental change.
O – Integration of lessons learned	Monitoring and evaluation, Sector policy and planning, Climate policy and planning, Conservation policy and planning, Ecological monitoring.	Policy/strategy review, Climate risk/ vulnerability data for people, Species and ecosystem data.

Checklist – Step 2

Final list of activities for the NAP Planning Team……………………………………………………………☐
Detailed plan to fill required capacity and information gaps ……………………………………………☐

Annex 1 – Capacity Need Categories

Capacity Need	Description
Climate policy and planning	Capacity to consider, articulate, consult on and formalize a particular set of objectives and commitments related to climate change, and steps to make progress towards those objectives.
Sector-specific policy and planning	Capacity to consider, articulate, consult on and formalize a particular set of objectives and commitments for a specific economic sector (non-conservation) and steps to make progress towards that objective.
Conservation policy and planning	Capacity to consider, articulate, consult on and formalize particular objectives and commitments related to biodiversity conservation and steps to make progress towards those objectives.
Climate modeling and downscaling	Capacity to prepare future scenarios of climate change for a given location based on a modeling process. These are typically obtained from 'downscaling' the products of Global Climate Models (GCM) because they are too coarse to be useful for local decision-making.
Climate impact modeling/Integrated assessment models	Capacity to use computer models to predict the impact of climate change on a given sector. For example, such a person could develop a predicted impact on the yields of a specific crop, or the impact of sea level rise and associated inundation on coastal communities, or in the terms of economic impacts (such as % of GDP).
Species distribution modeling	Capacity to apply models to predict the distributions of species across landscapes – also known as 'habitat suitability modeling' and 'niche modeling'. This skill is useful where limited actual observations of a species exist, coupling the biological characteristics and the conditions under which the species is known to exist to predict occurrence.
Environmental economics	Capacity to describe how economic activity and policy effect the environment, but also provides a framework for thinking about expenditure in environmental protection, and benefits of a less polluted environment in policy formulation (Smith 2011)
Geographic Information Systems	Capacity which allows the description, explanation and prediction of patterns at geographic scales, typically within a limited range of software applications.
Participative decision-making	Capacity to work across a group of stakeholders and facilitate collaboration and agreement on plans and activities.
Environmental Impact Assessment/Strategic Environment Assessment	Capacity to lead the design and development of studies that provide decision-makers and stakeholders with information on the likely effect on the environment of proposed development. The EIA is typically on a project-level, whereas the SEA is more focused on policies, plans or programs (i.e. before a decision is made on a particular form of development)
Monitoring and evaluation	Capacity to a) undertake an evaluation of a particular program, policy or project against a predetermined set of evaluation criteria – typically conducted either by internal staff or for more independence/objectivity, an external consultant and b) establish a monitoring framework so that the progress of the program, policy or project can be assessed through regular collection of data.
Social science/impact assessment	Capacity to study human society and of individual relationships within that society.
Ecological Engineering	Capacity to design of sustainable natural and artificial ecosystems that integrate human society with its natural environment.
Disaster Management	Capacity to guide efforts to minimize the loss of life, livelihoods and damage to property from hazardous events
Gender Mainstreaming	Refers to the ability to incorporate a gender perspective to any action, policy, legislation or action in order to ensure that the concerns of all are addressed and that gender inequalities are not perpetuated through institutional means (Alston et al 2013).
Ecological monitoring	Capacity to undertake systematic collection of ecological data at regular intervals over time. This can involve simple monitoring, survey monitoring, surrogate or proxy monitoring or integrated monitoring (Spellerberg 2005)

Annex 2 - Information Need Categories

Information Need	Description
Policy/strategy review	This information is produced through a policy review exercise and typically consistent of an assessment against predetermined criteria, key findings and a set of recommendations.
Historical climate data	This refers to historical records of temperature and precipitation for a given location, typically gathered through a weather station, automatic or otherwise.
Future climate projections	Description of the likely climate for the system under consideration, typically including mean temperature and precipitation for future periods as compared to historical periods.
Human responses to past climate events	Records (physical, official and unofficial) that characterize a response of a given system to historical changes in the climate system. Can include a range of sources including paleoclimatologists (experts on climates of past ages on earth), historical records and individual/community memories of events.
Species and ecosystem data	Description of a given ecosystem in terms of key parameters and how those parameters have changed over time.
Projected climate impacts on species and ecosystems	Describes possible impacts on species and ecosystems and the characteristics that may define different aspects of their vulnerability.
Climate risk/vulnerability data for people	Socio-economic information that describes people within the system and the characteristics that may define different aspects of their vulnerability.
Cost and benefit data for adaptation options, including ecosystems	Description of the value of adaptation options in the local vulnerability context, typically represented in terms of the local currency and/or USD.
Drivers of environmental change/pressures	Qualitative and/or quantitative description on the social mechanisms and relative importance of local pressures on specific form of environmental degradation, such as deforestation.
Effectiveness of ecosystems as a buffer for people	Quantitative description of the capacity of a given ecosystem type to mitigate a specific hazard risk.
Spatial data	Any data that can be represented spatially to aid orientation of decision-making.

Annex 3 – Capacity Cards (Example)

Species Distribution Modeling

1 - Description of capacity/skill

Ability to apply models to predict the distributions of species across landscapes – also known as 'habitat suitability modeling' and 'niche modeling'. This skill is useful where limited actual observations of a species exist, coupling the biological characteristics and the conditions under which the species is known to exist to predict occurrence.

2 – How does this skill/capacity contribute to adaptation planning?

Given the ability of this skill to predict distribution where it is largely unknown, this modeling is suited to predicting changes in species distributions and range shifts associated with changes to the rainfall and temperature profiles likely under climate change.

3 – Where can this skill be found?

This is a relatively new and specialized modeling skill found increasingly in the conservation profession. People familiar with geographic information systems (GIS) would be well positioned to build this skill.

4 - How can this skill be described in recruitment and tender exercises?

- *Skills and experience in species distribution modeling, including with the consideration of climate change scenarios.*

5 – What resources are available to help build this skill or capacity?

Texts:
- *Peterson et al, 2011, Ecological niches and geographic distributions. Princeton University Press.*
- *Franklin, 2009, Mapping Species Distributions: Spatial inference and prediction. Cambridge University Press.*

6 – What approaches can be used where this skill is not available?

Where this skill is not available, analogous conditions can be determined by field investigations (i.e. areas that are comparable with the expected environmental envelope of the future climate) and conclusions can be reached about the possible movement of the species.

Annex 4 – Information Cards (Example)

Policy and Strategy Review/Assessment

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1 - Description of Information Type

This information is produced through a policy review exercise and typically consistent of an assessment against predetermined criteria, key findings and a set of recommendations.

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2 - How can this information help inform consideration of ecosystems in adaptation planning?

Where there is interest in the compatibility of a particular policy with the objectives of the adaptation planning exercise. For example, to make a determination on whether an infrastructure plan accommodates the consideration of Ecosystem-based Adaptation (EbA). The adaptation plan will then seek to address any inconsistencies.

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3 - How can decision-makers be involved in generating this type of information?

It will be important for decision-makers to be involved in the establishment of the Terms of Reference (ToR) for the review, and this will improve access to relevant personal and documents, and also create a sense of ownership and legitimacy that will be useful for future discussion and consideration of findings. Similarly, senior managers are commonly required to prepare a formal 'management response' to the information.

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4 – What are some of the tools that can help generate this type of information?

There are a number of generic policy review processes that can be used to gather this information, including the following:
- *Clarificative evaluation (less complex, focus on describing policy rationale)*
- *Strategic Environmental Assessment (more complex, see dedicated card)*

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5 – What are some case studies in which this type of information has guided consideration of ecosystems in adaptation planning?

Review of current strategy and policy is a common starting point in adaptation planning, and such reviews are described in the NAPAs for Samoa, in particular the institutional capacities for implementation of priority activities: http://unfccc.int/resource/docs/napa/sam01.pdf

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6 – What are some of the risks and limitations of using this type of information and approaches to manage that risk?

There may in some cases be a 'gap' between the existence of a policy and its implementation, so wherever possible such information should seek to comment on the quality of implementation, including by considering previous reviews and management responses.