



CRISTAL Parks User's Manual Version 1

Community-based Risk Screening Tool – Adaptation and Livelihoods
Focus on Protected Areas and Conservation Zones

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Introduction

Photo: Stakeholders are identifying ecosystem services that support their livelihoods through a benefits web participatory exercise as part of a CRISTAL Parks application.

Background

Climate variability and change affect both natural and human systems, threatening biodiversity and the well-being of ecosystems and livelihoods around the world. Dependence on ecosystem services, including those provided by Protected Areas' (PAs) special features or conservation objects—such as drinking water, food, energy, revenue and protection from natural hazards—makes communities vulnerable to changing climatic and environmental conditions. At the same time, healthy PAs and ecosystems play a key role in reducing climate risks and helping to enhance the resilience of people to both climate and non-climate hazards.

Although climate variability and change may not always be the most important stresses affecting a specific conservation area and its nearby communities, they should be considered when designing and implementing conservation activities, particularly in communities characterized by climate-sensitive and/or natural-resource-dependent livelihoods. Indeed, any activity that does not account for present and future potential climate risks may not achieve its objectives; worse, it may inadvertently increase a community's exposure and vulnerability. For example, reforestation of an area in order to reduce pressure on long-standing forests and increase water availability, without taking into account climate change, might promote tree species unfit for a warmer climate in that area. This might also lead to communities' displacement, which, as a result, will be forced to live on land more exposed to climate hazards and increase local vulnerability in the longer term.

Without a tool to systematically assess the impacts of a conservation project or of a PA management plan on some of the local determinants of vulnerability and exposure, it is difficult for project planners and managers to design activities that foster adaptation to climate variability and change. While the adaptation agenda has been growing in recent years, its integration in conservation planning and development of relevant methodologies to do so has been much slower. This gap is even more important for guidance on integrating adaptation to increase social and ecological resilience to climate change. The Community-based Risk Screening Tool – Adaptation and Livelihoods (CRiSTAL) Parks seeks to address this gap. As a specialized version of the CRiSTAL tool, CRiSTAL Parks focuses more explicitly on the linkages between human communities and PAs or conservation zones to understand how this relationship creates vulnerabilities or supports the adaptive capacity of both people and ecosystems to the potential impacts of climate change.

Box 1: CRiSTAL

The original CRiSTAL tool was developed by a group of four international non-governmental organizations (NGOs) in response to the outcomes of the first phase of the Livelihoods and Climate Change Initiative, which demonstrated how ecosystem management and restoration and/or sustainable livelihoods projects contribute to risk reduction and climate change adaptation. Recognizing this potential, project planners and managers began asking how they could systematically integrate risk reduction and climate change adaptation into their work.

CRiSTAL was developed to respond to this need. Launched in 2007, it has since been applied in over 20 countries in Asia, Africa and the Americas by various institutions and development professionals. Between 2010 and 2012 a completely revised version of CRiSTAL was developed based on extensive user experience and feedback. More information is available at www.iisd.org/cristaltool.

In 2014 CRiSTAL was recognized by the Intergovernmental Panel on Climate Change as a decision-support tool that can help with adaptation risk management. It has been included in various toolkits, guidance documents and resources that support adaptation decision-making.

Key Concepts

| | |
|--|---|
| Adaptive capacity | The ability of institutions, systems and individuals to take advantage of opportunities or to cope with the consequences of potential damages from climate hazards (Millennium Ecosystem Assessment, 2005). |
| Climate adaptation | A process of adjusting human and/or natural systems in response to actual or expected changes in climate to reduce adverse impacts or take advantage of opportunities (adapted from Intergovernmental Panel on Climate Change [IPCC], 2007; Tompkins & Adger, 2003). In CRiSTAL Parks, climate adaptation is closely related to climate risk management. |
| Climate | "Average weather" or long-term averages of climate variables such as temperature, precipitation and wind across decades (usually 30 years) (adapted from IPCC, 2007). |
| Climate change | A statistically significant change in the state of the climate that persists for decades or longer. It can be a change in the mean, extremes or frequencies of climate parameters. Climate change may be due to natural internal processes or external forcing or to persistent anthropogenic changes in the composition of the atmosphere and land use (IPCC, 2007). |
| Climate-compatible conservation | Conservation approaches and practices sensitive to the changing climatic conditions. This means that conservation approaches actively consider and integrate climate variability and change—climate risks—into their functioning, adopting a forward-looking lens and managing resources effectively under uncertainties while avoiding maladaptation. CRiSTAL Parks tool aims to help conservation practitioners adopt climate-informed practices and design tailored adaptation measures; in other words, practice climate-compatible conservation. |
| Climate hazards | A potentially damaging hydro-meteorological event or phenomenon; they can be events that have an identifiable onset and termination, such as a storm, flood or drought, as well as more permanent changes, such as shift from one climatic state to another (United Nations Development Programme [UNDP], 2005). |
| Climate impacts | The effects of climate hazards and climate change on natural and human systems (adapted from IPCC, 2012). |
| Climate risk management | The systematic approach and practice of using climate information in development decision-making to minimize potential harm or losses associated with climate variability and change (adapted from UNISDR, 2009). In CRiSTAL Parks, climate risk management is closely related to climate adaptation. |
| Climate risks | The probability of harmful consequences or expected loss (e.g., death, injury, loss of livelihoods, reduced economic productivity, environmental damage) resulting from interactions between climate hazards, exposure to these hazards and vulnerable conditions (adapted from United Nations International Strategy for Disaster Reduction [UNISDR], 2009). |
| Climate variability | Variations (ups and downs) in climatic conditions from long-term means on time scales beyond that of individual weather events. Variability may result from natural internal processes within the climate system (internal variability) or to variations in natural or anthropogenic external forcing (external variability) (adapted from IPCC, 2001). |
| Conservation objects | "Within the conservation planning community, a 'conservation target' generally refers to the specific biological or ecological features (e.g., species, habitats, ecological processes, or other entities) that are the focus of one's conservation attention" (Stein et al., 2014:73). |
| Disaster Risk Reduction (DRR) | DRR "aims to reduce the damage caused by natural hazards like earthquakes, floods, droughts and cyclones, through an ethic of prevention" (United Nations International Strategy for Disaster Reduction [UNISDR], 2014). Here we focus on climate-related hazards, thus on climate risk reduction. |
| Ecosystem services | Ecosystem services are the benefits people obtain from ecosystems. These include provisioning services such as food, water, timber, and fiber; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling (Millennium Ecosystem Assessment, 2005). |
| Exposure | The number of people and types of assets present in climate hazard-prone areas (e.g., number of people in arid regions, number of dwellings in a floodplain) (adapted from UNISDR, 2009). |
| Livelihoods | The combination of resources (natural, human, physical, financial, social, and political), activities, and access to these that together determine how an individual or a household make a living (adapted from Ellis, 2000). Here we understand livelihoods as all the productive activities being undertaken in a particular location, including farming, livestock rearing, tourism and mining. |
| Protected Area | "A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley, 2008). |
| Sensitivity | The degree to which people and assets are affected, either adversely or beneficially, by climate variability or change (IPCC, 2007). |
| Sub-conservation objects | These are also called subsidiary values or subsidiary targets. They represent components of specific conservation values such as: the specific plants—conservation attributes—that compose a particular type of wood—the conservation object; the animal species that compose an Andes Fauna; or the rivers, streams, lakes and glaciers that constitute or render a watershed functional. |
| Vulnerability | Susceptibility to harm. In CRiSTAL Parks, it refers to the susceptibility of a project area/protected area to the adverse effects of a climate hazard. Vulnerability is a function of the system's sensitivity and adaptive capacity (adapted from IPCC, 2012). |
| Weather | The state of the atmosphere at a particular place and time, with regards to a variety of factors including heat, cloudiness, dryness, sunshine, wind, rain, etc. (modified from Online Oxford Dictionaries). |



Part 1: CRiSTAL Parks at a Glance

Photo: A protected area management team is entering data collected during a participatory stakeholders' workshop into the CRiSTAL Parks tool.

What is CRiSTAL Parks?

CRiSTAL Parks is a decision-support tool that helps users design activities that support climate adaptation (i.e., adaptation to climate variability and change) in Protected Areas (PA)—dependent communities. CRiSTAL stands for “Community-based Risk Screening Tool – Adaptation and Livelihoods”:

- “Community-based” – focussing on conservation projects and management plans (i.e., conservation activities) at the local level. CRiSTAL Parks integrates community perspectives in participatory stakeholder workshops.
- “Risk Screening” – helps users to identify and prioritize climate risks that their conservation activities might address.
- “Adaptation and Livelihoods” – helps users to identify conservation objects, the benefits or ecosystem services they provide to livelihoods most important to climate adaptation, and use these as a basis for designing adaptation activities.

CRiSTAL Parks focuses on livelihoods that depend on conservation objects. Conservation objects are used as a reference for PAs or conservation zones, as they are the target of activities and often provide ecosystem services or benefits that directly or indirectly support livelihoods.

Box 2: Overview of CRiSTAL Parks

Objectives: CRiSTAL Parks helps users to understand:

- How current and potential future climate hazards, affect/may affect a project or a PA management plan, its critical ecosystems and conservation values, referred to as “conservation objects” and the local livelihoods they support.
- How people inside and around PAs respond to the current and potential future impacts of these climate hazards.
- Which conservation object benefits or ecosystem services are most affected by current and potential hazards, and which ones are most important for reducing climate risks.
- How conservation activities affect the status, access to or availability of these critical conservation objects.
- What adjustments (revision of existing activities and/or design of new activities) can be made to support climate adaptation and reduce climate risks?
- How climate risk management can be integrated into a monitoring and evaluation framework.

Target user: CRiSTAL Parks targets conservation practitioners working with PAs* or similar conservation zones, their managers and authorities, including consultants tasked with updating or developing PA management plans. However, a wide range of other actors may also use the tool (including policy-makers, decision-makers and NGOs).

Approach: It relies on information collected from desk-based review and participatory stakeholder workshops using participatory methods. Conceptually, CRiSTAL Parks draws from the CRiSTAL Tool centred on the Sustainable Livelihoods Framework (Ellis, 2000), on the Millennium Ecosystem Assessment (2005) framework and from standard PA management frameworks.

Key outputs: Applying CRiSTAL Parks leads to three main outputs:

1. Summary analysis of climate risks to conservation objects and livelihoods, including a list of conservation object benefits or ecosystem services that are most affected by climate hazards and most important for responding to climate impacts.
2. Proposed adjustments to existing conservation activities and new activities to support climate adaptation.
3. List of desired adaptation outcomes and important influencing factors and indicators to be monitored.

Outcome: Projects or management plans increase the resilience of PAs and the livelihoods they support in the short and long terms in a context of climate risk.

Format: CRiSTAL Parks is a desktop application compatible with Microsoft Windows 7 operating systems and subsequent versions. It is currently available in English and Spanish (please check: <https://www.iisd.org/cristaltool/> for updates).

*By PAs, we mean PAs according to International Union for Conservation of Nature (IUCN) categories II, III, IV, V and VI, as well as any other conservation zone such as wilderness areas, private conservation areas, biological corridors and their zones of influence, among others.

CRiSTAL Parks helps users integrate climate adaptation into conservation projects and PA management plans.

CRiSTAL Parks helps users understand the links between a conservation project or a PA management plan and its contribution to climate adaptation. Most project or management plans are not designed with an explicit consideration of climate risks to PAs and to their dependent communities. Likewise, projects are not usually designed to take into account the longer-term implications of climate change and how project activities might influence ecosystems and conservation objects that are vulnerable to climate change and/or underpin the capacity of local communities to adapt to change. CRiSTAL Parks helps project planners and PA managers ensure that their activities support (by harnessing the potential of PAs to reduce climate risks) or, at a minimum, do not constrain climate adaptation of PAs’ dependent communities.

Figure 1 shows the linkages between a project cycle, the adaptation process and the CRiSTAL Parks process, while Figure 2 shows the linkages between a PA management cycle and the CRiSTAL Parks process more specifically.

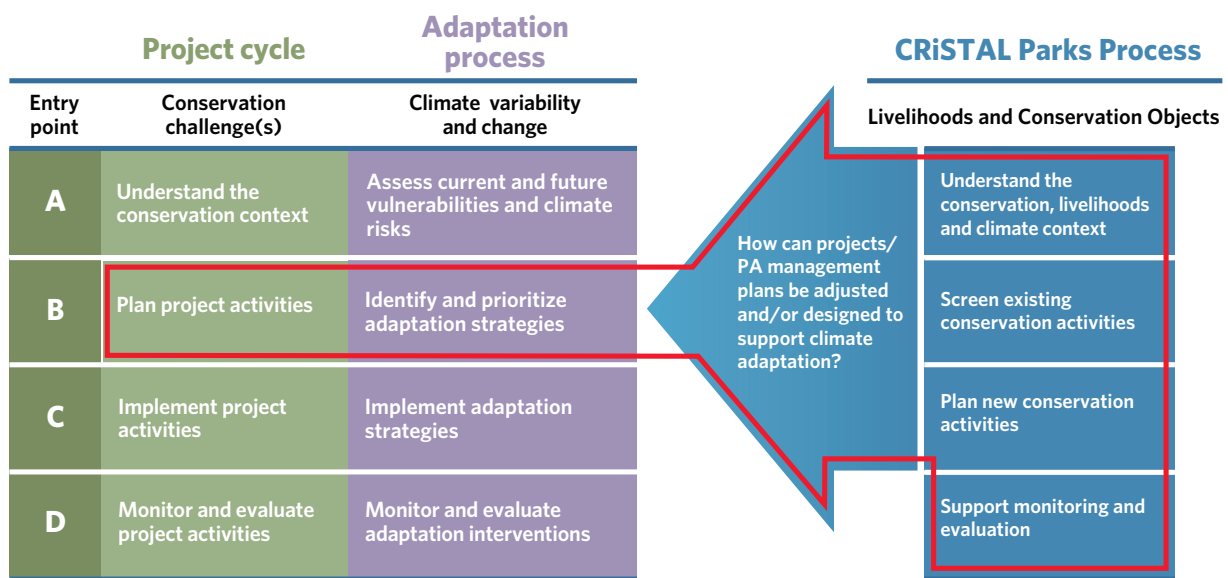


Figure 1: Linkages Between a Project Cycle, the Adaptation Process and the CRiSTAL Parks Process

Project cycle: The process of undertaking a development or conservation intervention is usually described using the “project cycle,” which involves four general steps: understanding the development context, planning, implementing, and then monitoring and evaluating (M&E) project activities. CRiSTAL Parks specifically targets conservation projects and can be most useful at the planning stage (Step B of the project cycle), where specific project activities are designed, while also contributing to other stages of a project cycle. Another way to describe conservation interventions in the context of PAs is through the PA management plans process (see Figure 2).

Adaptation process: The process of adapting to climate variability and change is also typically composed of four broad steps: assessing vulnerability and climate risks, identifying and prioritizing adaptation strategies, implementing adaptation strategies and M&E adaptation interventions. These match up nicely with the steps in the project cycle, thereby demonstrating how adaptation could be integrated into projects—that is to say, assessing current and future vulnerabilities and risks could be part of efforts to understand the development and conservation context, identified adaptation strategies could be included in the list of planned project activities, and so on. CRiSTAL Parks supports users primarily in the design of adaptation strategies (Step B of the adaptation process), although it also helps users gather some information on current and future risks and prepare users for the implementation stage.

CRiSTAL Parks process: CRiSTAL Parks helps users to: i) understand the livelihoods, conservation and climate context of a PA or area of interest; ii) screen existing project or PA management plan activities to assess their impacts on the conservation objects that are important to climate adaptation, and revise these activities accordingly; iii) plan new project or management plan activities that support climate adaptation (i.e., adaptation strategies); and iv) support M&E. The list of revised activities or new adaptation strategies contributes directly to Step B in both the adaptation planning process and the project cycle in Figure 1. However, information gathered to establish the livelihoods, conservation context and benefits from conservation

objects as well as the climate context in CRiSTAL Parks can also contribute to a risk assessment (Step A of the adaptation process). Moreover, the action plans defined in the tool can contribute to the implementation of activities (Step C of both the adaptation process and project cycle), and the information gathered and defined in relation to M&E indicators and targets can contribute to an M&E system (Step D).

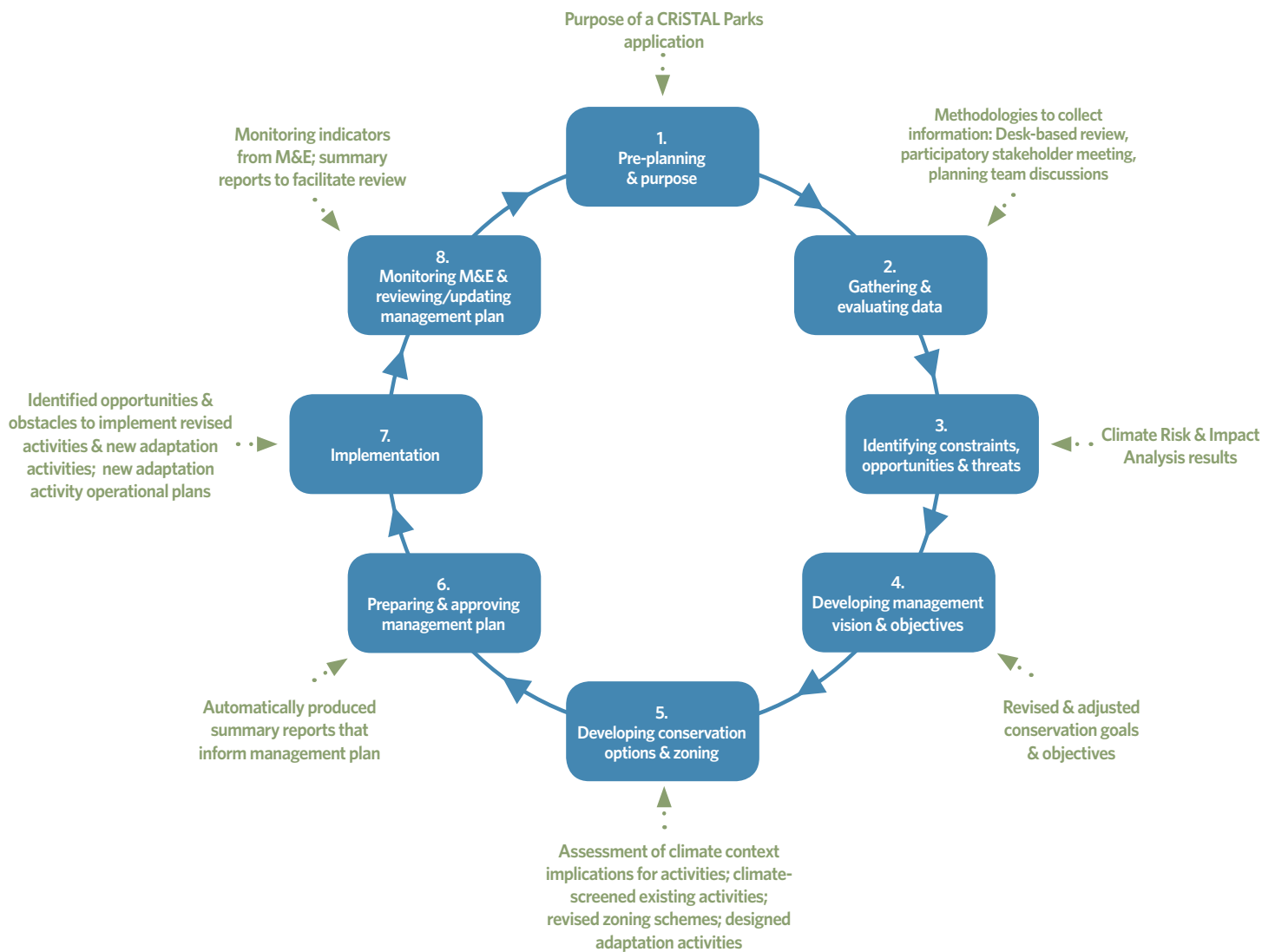


Figure 2: Linkages between a PA Management Plan Process and the CRiSTAL Parks Process

Figure 2 shows the linkages between a PA management plan process and the CRiSTAL Parks process: blue arrows and boxes represents a typical management plan development steps; green text and arrows show entry points for CRiSTAL Parks, where results of its application can be directly integrated into a management plan.

The CRiSTAL Parks process is aligned with the conceptual framework for developing standard PA management plans using IUCN (2003) guidelines. This ensures that the tool application and its results are compatible with a standard management of conservation areas as well as with the conservation objectives established by them. For all phases of a management plan process (see Figure 2), the tool complements the necessary information either by revising it or by incorporating as necessary climate information to ensure the conservation management is climate compatible.

CRiSTAL Parks is a decision-making framework centred on livelihoods and the conservation object benefits or ecosystem services upon which they depend

Livelihoods provide a first entry point for the CRiSTAL Parks analysis, based on the assumption that managing current and future climate risk at the local level requires an understanding of how livelihoods are conducted and sustained. By understanding the dynamics of people's livelihoods, one can begin to understand how they will be affected by climate, how they might respond with the resources they have, what additional resources may be required, and how these conditions can be reflected and built upon for effective responses over the long term.

As a second entry point, CRiSTAL Parks is specifically interested in the conservation object benefits or ecosystem services that support the livelihoods of PA-dependent communities. It draws both from PA management frameworks, which centre on conservation objects, and from the Millennium Ecosystem Assessment (2005) framework, which looks at four types of contributions from ecosystems to people's livelihoods (provisioning, regulating, cultural and supporting ecosystem services).

While conservation object benefits and ecosystem services are considered similar in CRiSTAL Parks, the tool uses conservation objects as a starting point to represent PAs and uses their benefits as representing any type of services that they provide to livelihoods and also to biodiversity. Thereby, CRiSTAL Parks uses concepts of both social and ecological vulnerability to understand the relationship between PAs and people's livelihoods, how these linkages transmit climate impacts from conservation objects to livelihoods, and how conservation object benefits or ecosystem services support local response strategies to climate impacts. The tool also assesses the contribution of conservation activities to climate adaptation by looking at their influence on critical conservation objects and their benefits.

How Does CRiSTAL Parks Contribute to Climate Vulnerability and Risk Assessments?

CRiSTAL Parks can contribute to vulnerability and risk assessments by helping users to collect, synthesize and organize information about: a) the development and conservation context, b) the climate context, c) climate impacts and risks and d) the design of adaptation responses.

However, CRiSTAL Parks is not a stand-alone vulnerability or risk assessment tool. It does not take users through all of the steps for gathering and analyzing information needed to understand who and/or what is most vulnerable in a project area and why—a range of other tools and frameworks is available for this purpose.¹ Rather, CRiSTAL Parks is narrower in its focus; it takes users through a series of steps to gather and analyze information on local livelihoods, conservation objects and climate in order to understand which conservation object benefits or ecosystem services should be targeted in project or PA management plan activities to support adaptation. Table 1 clarifies the role of CRiSTAL Parks in a climate risk assessment.

¹ See, for example: USAID's guidance manual for development planning, *Adapting to Climate Variability and Change* (2007), available from http://pdf.usaid.gov/pdf_docs/PNADJ990.pdf; the Red Cross/Red Crescent's *Climate Guide* (2007), available from http://www.climatecen-tre.org/downloads/File/reports/RCRC_climateguide.pdf; and the PROVIA *Guidance on Assessing Vulnerability, Impacts and Adaptation (VIA)* (draft, 2012), available from http://www.unep.org/provia/Portals/24128/PROVIA_guidance_report_low_resolution.pdf

Table 1: Role of CRiSTAL Parks in a Climate Risk Assessment

| Comprehensive climate risk assessment | | | | CRiSTAL Parks | |
|---------------------------------------|---|--|--|--|---|
| | Must understand... | Information required | Key questions | Addressed? | Where? |
| A | Current and future development trends | <ul style="list-style-type: none"> Development conditions, trends and challenges | <ul style="list-style-type: none"> What are the development and conservation goals and objectives for the target area/communities? What are the main non-climate stresses affecting their achievement? How are the socioeconomic, political and demographic contexts changing? What will it look like in the future? | Partly (only focus on current livelihoods) | <ul style="list-style-type: none"> Conservation, livelihoods and climate context (step 1, see Figure 4 next page) |
| B | Actual and expected climate context | <ul style="list-style-type: none"> Current weather and climate Current climate variability and extremes Observable climate changes Projected climate changes | <ul style="list-style-type: none"> What are the current weather and climate conditions (rainfall and temperature patterns)? What are the main climate hazards (location, intensity, frequency)? How have climate variables (temperature, rainfall) and hazards changed in recent years? How will climate variables and hazards change in the coming decades? | Yes Yes Yes Yes | <ul style="list-style-type: none"> Climate risk analysis (step 2) |
| C | Climate impacts and risks associated with actual and expected climate variability and change | <ul style="list-style-type: none"> Current and future exposure Current and future vulnerability Current and future climate risk | <ul style="list-style-type: none"> Which people/resources are located in areas prone to climate hazards? How are people/resources affected by climate hazards? Why? (Sensitivity) What do people do to respond to the impacts? (Adaptive capacity) What are the probabilities and the range of potential harmful consequences of climate variability and change? | Partly (only focus on current exposure) Partly (only focus on current impacts, does not explore the “why” question in detail) Partly (only focus on current impacts) | <ul style="list-style-type: none"> Climate risk analysis (step 2) |
| D | Response strategies that minimize negative impacts and maximize positive ones | <ul style="list-style-type: none"> Response options available Feasible and effective options | <ul style="list-style-type: none"> What do we want? What are the options? What is working now? What may work in the future? What can be actually implemented based on costs, benefits, trade-offs, etc.? | Yes Yes | <ul style="list-style-type: none"> Revise existing projects or management plans and/or design new adaptation activities (step 3 and 4) |

How do Users Apply CRiSTAL Parks?

CRiSTAL Parks is organized according to three modules and five analytical steps that build on each other:

- A. Understand the conservation, livelihoods and climate context
- B. Evaluate the implications for the project or management plan
- C. Support M&E of climate adaptation

Depending on needs, users can select those steps that are relevant for their context. Module A, which focuses on understanding the conservation, livelihoods and climate context, is compulsory. Module B and C are optional. Users can decide to conduct either or both of Steps 3 and 4 of Module B, which guide them through the revision of existing project or management plan activities and help design new adaptation activities, respectively. Module C (Step 5) is optional for those who have completed either Step 3 or 4 (or both), and helps identify elements for a monitoring and evaluation scheme of your activities. Figure 3 summarizes the overall CRiSTAL Parks framework.

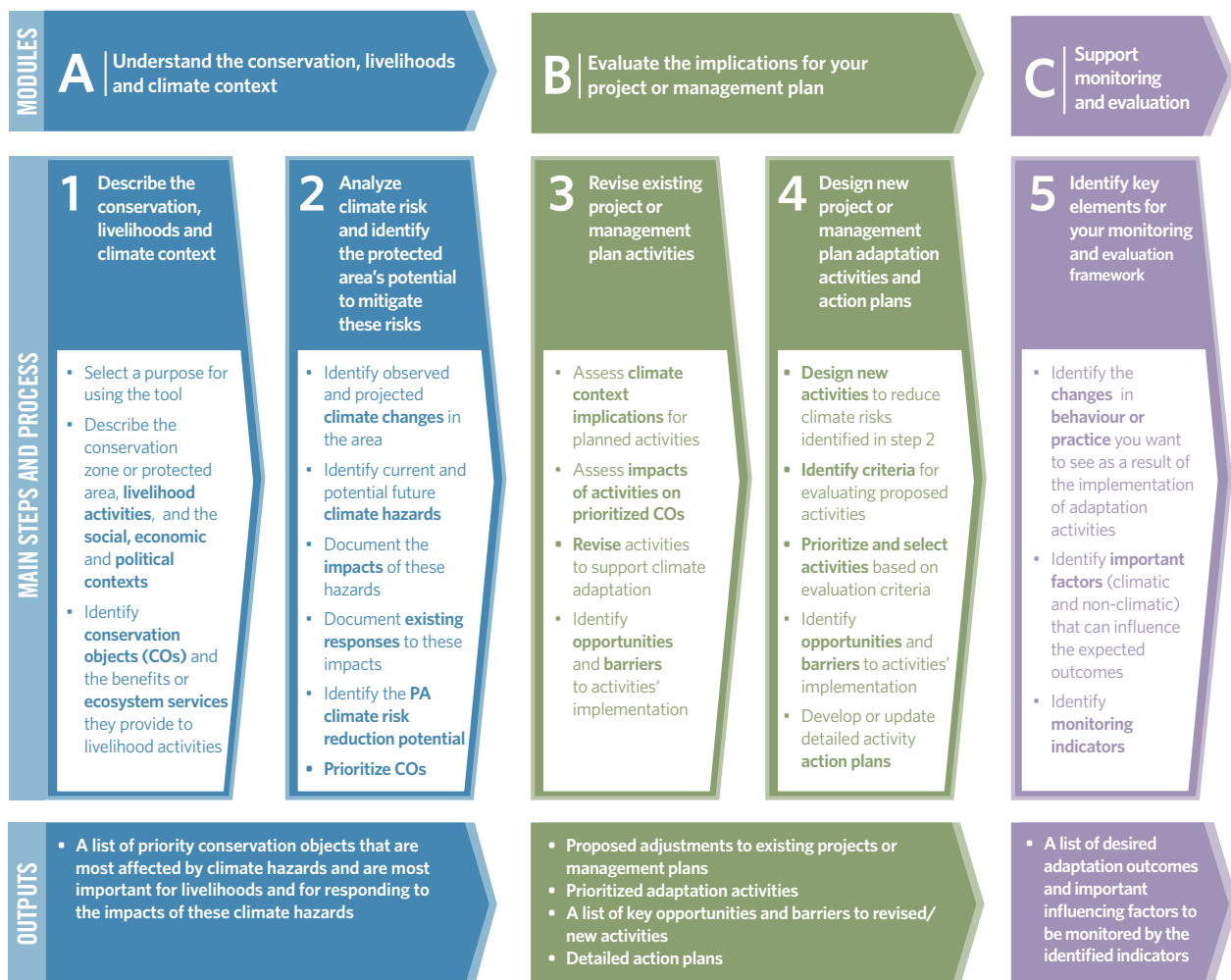


Figure 3: The CRiSTAL Parks Framework

For each module, the tool guides the user through different analytical steps with specific outputs

- **Module A: "Understand the conservation, livelihoods and climate context of the focus conservation area":** The user is first asked to **describe the conservation and livelihood context (Step 1)** of the area of interest and then to **analyze** the climate risk (Step 2), specifying the impacts of and responses to identified climate hazards in the project or management plan area. The information collected and organized under these steps provides a basis for the rest of the analysis.
 - > **Main outcome:** A list of priority conservation objects that are (i) most affected by climate hazards and (ii) most important for livelihoods and for responding to the impacts of these climate hazards.

- **Module B: “Evaluate the implications for the project or management plan”:** Building on the information collected under the previous steps, users analyze how project or management plan activities affect conservation object benefits or ecosystem services that are either vulnerable to climate hazards and/or important for responding to the impacts of these hazards. Specifically, the user assesses the impacts of activities on these climate-relevant livelihood resources. The user can then **revise the project or management plan activities (Step 3)** so that conservation object benefits or ecosystem services that underpin livelihoods are less exposed or vulnerable to climate hazards, or are better able to support local responses to climate impacts. The user can also **design new adaptation activities (Step 4)** if they do not have an existing project or management plan to screen or feel that existing ones require more than activity adjustments to reduce the climate risks identified in Step 2. The user is also asked to identify the opportunities and barriers to the implementation of the revised and/or new activities and develop detailed action plans for new activity implementation.
 - **Main outcomes:** A list of project or management plan adjustments and prioritized new activities that support climate adaptation; a list of key opportunities and barriers to revised/new activities implementation and implementation action plans for new activities.
- **Module C: “Support the monitoring and evaluation of climate adaptation”:** Finally, the tool helps the user to identify **key elements to be integrated into an existing or newly developed M&E framework (Step 5)**. The user is asked to think about the revised/new activities in terms of the changes in behaviour or practice that he/she wants to see by the end of the project or management plan as a result of implementing the adaptation activities (i.e., adaptation outcomes) and to identify the important factors (climatic and non-climatic) that can influence the expected outcomes (i.e., key contextual factors). The user is also asked to identify corresponding indicators to monitor implementation and track results.
 - **Main outcome:** A list of desired adaptation outcomes and important influencing factors to be monitored by the identified indicators.

What Methods Are Used?

The CRiSTAL Parks analysis relies on a combination of primary information gathered through participatory methods (stakeholder consultations, project team discussions) and secondary information gathered through desk-based research. CRiSTAL Parks provides a framework for organizing, in a simple and logical format, the information collected both at the local level (participatory stakeholder workshops with community members and other local experts) and at the national level (e.g., scientific information on climate change projections), thus facilitating an integrated approach.

Consultations are Central to the CRiSTAL Parks Process

While some scientific information is required to analyze climate risk (Step 2), the remaining steps can be completed by collecting information through consultations and discussions with community representatives and other key project or management plan stakeholders.

Project or management plan planners and managers often have experience with working in a community or possess different types of detailed information on a project or PA zone. But this knowledge does not necessarily include **detailed information on the livelihoods, its linkages with conservation objects and local climate context** necessary to undertake the CRiSTAL Parks analysis. As a result, it is highly recommended that CRiSTAL Parks users undertake consultations with community members and other key actors, experts and partners (e.g., local government representatives).

The approach and specific methods selected for engaging local stakeholders in applying CRiSTAL Parks is **flexible** and generally left to the discretion of the user. However, CRiSTAL Parks provides useful tips and references on how to collect most of the information. Specific information on participatory methods that can be used for each analytical step can be found in the second part of this manual.

Participatory Stakeholder Workshops

CRiSTAL Parks users should engage community members as well as other key stakeholders such as conservation and development organizations active in the focus area, social organizations, private companies, other NGOs and regional and local government representatives as well as researchers and academics to ensure projects or management plans are planned, adjusted and managed according to local ecological and social needs, priorities and conditions. This also allows users to triangulate the information collected at different stages. The structure, purpose and duration of these consultations taking place in the form of participatory stakeholder workshops can vary according to the user's needs and resources. Typically, first the project team or PA/conservation area management team (i.e., the planning team) would meet to decide on the purpose of the analysis and collect secondary information. Then, the planning team could decide to organize one or several participatory

stakeholder workshops to collect most of the information and undertake the analysis of the results. (See also the section entitled “What Resources are Required” below).

Community members in the conservation area or its surroundings and other key stakeholders can be engaged throughout the entire CRiSTAL Parks process (from Steps 1 to 5 of the CRiSTAL Parks framework, page 16) or engaged in only certain steps of the analysis. Typically, community members should be consulted at least in Steps 1 and 2 of the CRiSTAL Parks process to gather information on livelihoods, conservation and local climate context, and to discuss the links between the three (i.e., How do climate hazards affect conservation objects and thereby the benefits or ecosystem services they provide to local livelihoods? How important are these conservation objects for responding to climate risks?). The objective is to explore local-level perceptions on climate hazards and their impacts, as well as current and potential responses to current and potential future climate risks in selected conservation areas. The project or management team is encouraged to also consult other key experts, such as researchers, academics, NGOs and government representatives to complement the information on:

- Development conditions and other socio-political trends affecting the focus area
- Information on the PA or conservation zone, in particular its conservation objects and its benefits or ecosystem services
- Regional and local climate conditions/forecasts

Typically, discussions among project team members or PA management teams are sufficient for undertaking Step 5 of the analysis; however, we recommend users to always validate results with key stakeholders identified to ensure validity, uptake of results and, later on, to facilitate activities' implementation.

The information can be collected through organized participatory stakeholder workshops, informal meetings, and/or site visits using Participatory Rural Appraisal (PRA) tools and similar tools (e.g., hazard mapping, benefits web). Different social groups often have different roles and responsibilities in a community, and as such they tend to be affected by and respond to climate risks differently. Therefore, the analysis should take into account the experiences and opinions of different social groups, particularly men and women. We invite users to take this into account when selecting key stakeholders for consultations.

What Resources Are Required to Apply CRiSTAL Parks?

The resources required to apply the CRiSTAL Parks tool can vary according to the objectives and capacities of the users. Typically, the users will need between *two and five days* to conduct all the steps, which includes time for preparation, participatory stakeholder workshops, data entry into the tool and data analysis. Costs will vary, but generally it involves the costs associated with the project team or PA management team (i.e., the planning team) meetings and the workshop-based consultations. It is highly recommended that new users acquire training to benefit the most from the tool. Please refer to the CRiSTAL website(www.cristaltool.org) to learn about training opportunities.

Table 2 lists the key resources required for CRiSTAL Parks according to two different steps: (i) collecting data through the consultations and entering the data into the desktop application and (ii) analyzing the results. Data entry and analysis could be done by a single user, but it is recommended that it is done with the cooperation of a variety of users to stimulate the exchange of ideas and build ownership of the results by the planning team (i.e., project team members or PA/conservation area management team members) and local partners.

Table 2: Summary of Key Resources Required for CRiSTAL Parks

| Resources | Data collection (i.e., participatory stakeholder workshops) | Data entry and analysis (individual or team meeting) |
|---------------------|--|---|
| Knowledge | <ul style="list-style-type: none"> Basic knowledge about climate variability and change, climate adaptation, livelihoods, community dynamics, conservation status, participatory approaches, Rapid Rural Appraisal/ Participatory Rural Appraisal tools | <ul style="list-style-type: none"> Basic knowledge about climate variability and change, climate adaptation, livelihoods, community dynamics and conservation status |
| Skills | <ul style="list-style-type: none"> Experience in applying PRA tools Good facilitation skills to ensure participants can speak freely under a structured guidance Ability to be fully functional in local language(s) | <ul style="list-style-type: none"> Basic computer literacy Ability to synthesize different sources and types of information Analytical skills |
| Participants | <ul style="list-style-type: none"> At least two facilitators (one moderator and one note taker) Relevant stakeholders to participate in one or more participatory stakeholder workshops include: community members, conservation and development organizations, NGOs and civil society organizations, researchers and academics, local government representatives and private companies all active in the focus area (maximum 25 participants recommended). Ensure there are representative multistakeholder participants | <ul style="list-style-type: none"> The number of participants (planning team, consisting of project team or conservation area management staff and other local partners) will depend on the objectives and resources available. It is highly recommended to involve a multistakeholder team (i.e., project or management plan team and partners from community, local government and civil society). For example, involving local government representatives can help to secure ownership of the results. |
| Time | <ul style="list-style-type: none"> Consultations can be organized during one or more participatory stakeholder workshops depending on the objectives and resources available. Count one to four days for a complete participatory stakeholder workshop | <ul style="list-style-type: none"> Typically, data entry and analysis can take between half a day and two days. |
| Materials | <ul style="list-style-type: none"> Flipchart paper, colour markers, coloured paper, masking tape, notebooks and clipboards Recording device and camera to document the process (if deemed appropriate) Snacks/lunch/water (depending on how much time the meeting will take, and where it will take place) Name tags are recommended Certificates of attendance for participants are recommended | <ul style="list-style-type: none"> Computers/laptops. CRiSTAL Parks is only compatible with Microsoft Windows 7 operating systems and greater versions. Printer (recommended but optional) to distribute the summary reports to all participants to facilitate analysis. |
| Cost | <ul style="list-style-type: none"> Cost will vary according to the number of participants and the location of the workshop(s). | <ul style="list-style-type: none"> CRiSTAL Parks is a free desktop application, available online (www.cristaltool.org). Once users have downloaded the tool, it can be used without being connected to the Internet. Meeting costs and human resources |



Part 2: CRiSTAL Parks Step-by-Step

Photo: Participants of a stakeholders' workshop are drawing a map of a protected area and of the key livelihood resources. The use of visual aids is recommended to maximize participation and interaction, particularly when there are language barriers involved.

General

Installing CRiSTAL Parks on a Computer

- Download the tool from the CRiSTAL website (www.cristaltool.org) onto the computer.
- Double-click on the "setup.exe" file to run the application. The setup application will guide you through the installation process.

Navigating through CRiSTAL Parks

- **The left-hand side menu:** This menu provides an overview of the different steps and allows you to move from one step to the other. To move from one step to the other, click on any of the options on the menu and you will be taken directly to that specific page. Once you are on a specific page, this step on the menu is highlighted to help you remember where you are in the process. Additionally, each step is numbered in the top right corner.
- **Top left corner menu: This menu offers some basic functionalities, including:**
 - The "**File**" link allows you to open an application previously saved and to save the current application.
 - The "**About**" link provides some background information about the tool and its development history, and the resources required for undertaking the analysis.
 - The "**Language**" link allows you to select and change the language of the tool.
 - The "**Help**" link provides information about key concepts, useful guidance buttons, the CRiSTAL website and the application (version and copyright).

Entering and Updating Information

- **Flexibility:** CRiSTAL Parks is flexible; you can navigate back and forth among the different pages at any point in the process to revise, update and change information as needed.
- **Level of detail and language:** While the application does not have word limit for the information to be entered in the different boxes, the user should be as specific as possible and use precise, concise sentences, as the information you insert will be automatically included in summary reports.

Getting Help and Guidance



- **Blue question mark buttons:** This function provides short definitions and descriptions for specific steps. To see the information, place the cursor over the buttons and a text box will appear.
- **Green guidance button (top right of each page):** This button links to guidance on how to collect the necessary data and information for each step. Clicking on this button will open a page in the Internet browser where the guidance is displayed. This function works both offline and online.

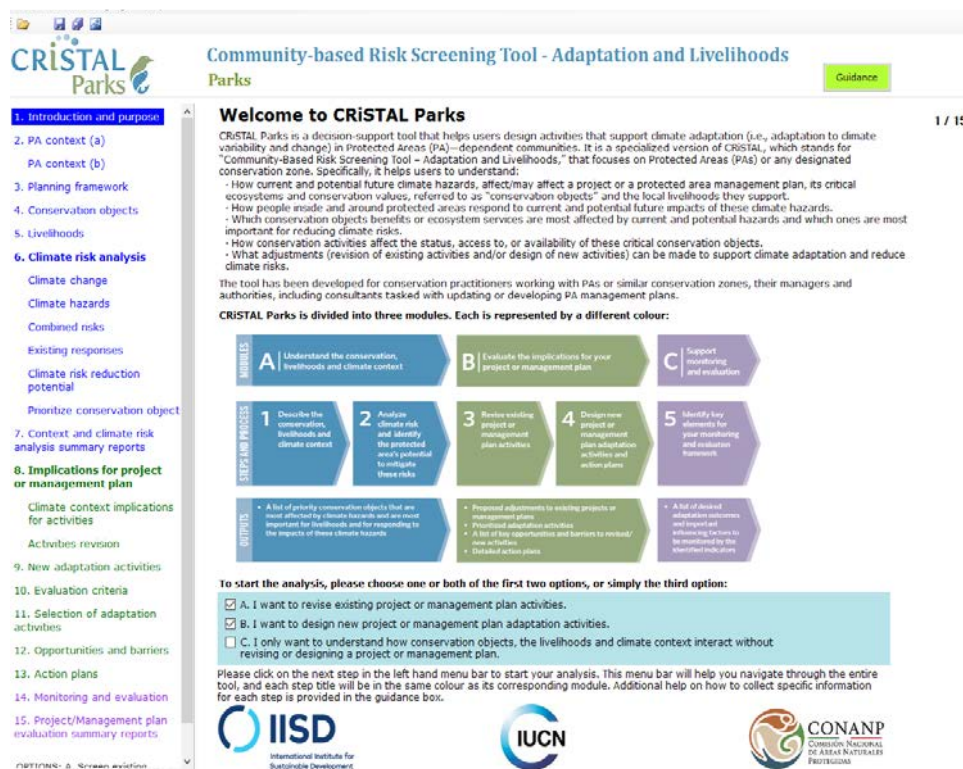


Step > Introduction and Purpose

Objective > To understand the purpose and objectives of CRiSTAL Parks and specify the user's objectives.

- Process >**
- Read the introductory text to make sure that you understand the purpose and objectives of the tool.
 - **Choose among three options:**
 - A. "I want to revise existing project or management plan activities": In this case, you already have project activities or management plan activities designed for a conservation area and want to assess the impacts of those activities vis-à-vis climate adaptation to adjust and design activities that foster adaptation.
 - B. "I want to design new project or management plan adaptation activities": In this case, you want to design new activities from scratch.
 - C. "I only want to understand how conservation objects, the livelihoods and climate context interact without revising or designing a project or management plan": In this case, the user's objective is to get a better understanding of the conservation object benefits or ecosystem services most affected by climate hazards and most important for responding to climate impacts.

You can choose either or both of the first two options or just the last option. The menu on the left hand side of the screen changes automatically depending on which option is checked.

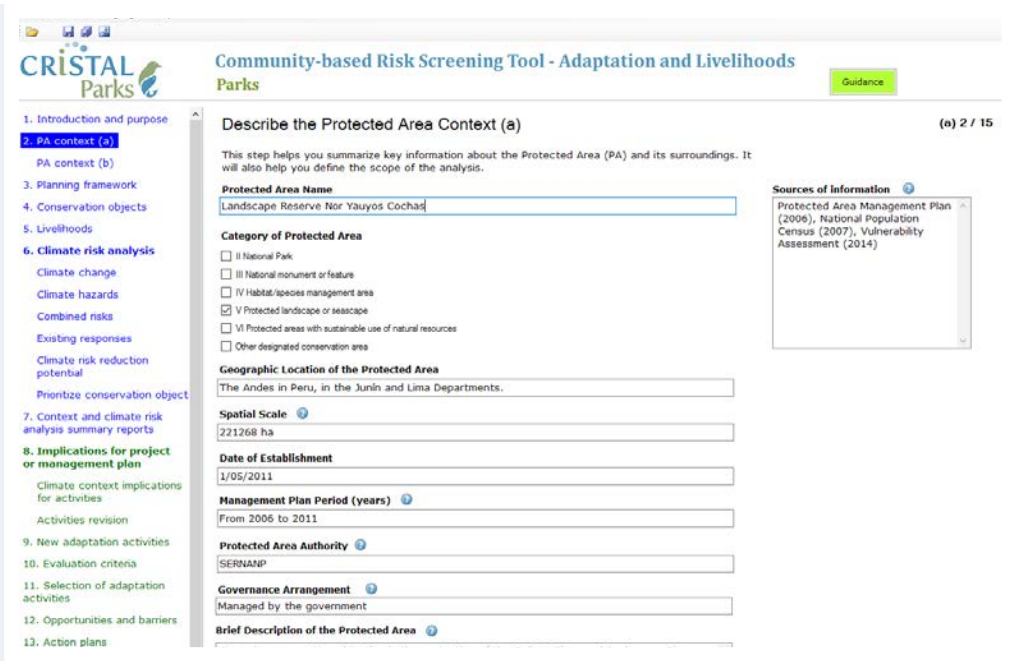


- Once you are familiar enough with the CRiSTAL Parks process and how to use the software, you can begin to enter information for the analysis.
- **Move to the next step by clicking on "PA context" on the left-hand menu.**

Step > Describe the Protected Area Context (a)

Objective > To summarize key information about the PA where the project or management plan is applied

- Process >**
- Enter some basic information about the PA or conservation zone where your activities are/will be implemented. This information includes:
 - **PA name:** name of the PA or any type of conservation zone of focus.
 - **Category of the PA:** choose one of IUCN's PA categories that define your site or select the "other" category if none correspond.
 - **Geographic location of the PA:** geographical location (e.g., watershed, district, region, country).
 - **Spatial scale:** PA or conservation area size in hectares.
 - **Date of establishment:** date when the conservation area was legally established.
 - **Management plan period:** from when to when is the management plan of the PA relevant?
 - **PA authority:** name of the organization(s) or institution(s) in charge of managing the PA.
 - **Governance arrangement:** type of management system (e.g., publicly managed, co-managed between government entity and local communities, community managed or privately managed).
 - **Brief description:** key information that helps characterize the PA (e.g., types of key ecosystems, flora, fauna, cultural importance, etc.).
 - **Management zones:** If you are using the tool to integrate climate risks into a PA management plan, enter all management zones and their purposes, which can be found in the zoning scheme.
 - **PA map:** upload a map of the PA if you wish to do so (compatible formats include jpeg, tif, gif and png).
 - To move to the next step, "PA Context (b)", use the left-hand menu.



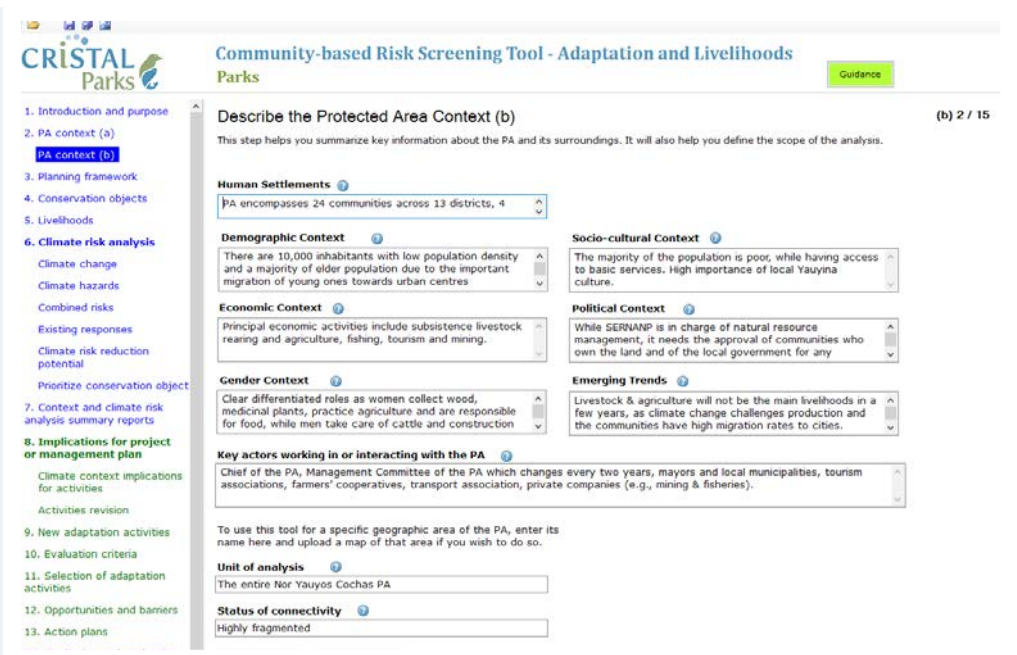
Method > Review existing **PA documents** (e.g. management plan, PA authority documents)

- Tips >**
- Be concise and specific.
 - Even if you do not wish to revise or design new activities, this information helps to frame your analysis.
 - Fill the information in even if you wish to climate-screen a project and not a PA management plan, as you are implementing activities within the framework of a conservation area, which is managed by a management plan.

Step > Describe the Protected Area Context (b)

Objective > To summarize key information about the PA and its surroundings as well as define the unit of analysis

- Process >**
- **Describe the PA context:** enter information about the following themes:
 - **Human settlements:** name and number of communities and/or villages in the focus area and the degree of accessibility of the area.
 - **Demographic context:** population density or number of inhabitants in the focus area or around it.
 - **Socio-cultural context:** observations or secondary information on the level of human development, poverty and conditions of access to basic needs and services in the focus area.
 - **Economic context:** the main economic activities predominantly practised in the area and around it.
 - **Political context:** features of the governance system in place, description of eventual conflicts and level of participation of stakeholders to decision-making.
 - **Gender context:** observations or secondary information on gender and diversity, such as observed differences in the economic activities between men and women, age or other social groups.
 - **Emerging trends:** descriptions of how previous factors might evolve in the next 5-10 years (e.g., population increase, migration, change in natural resource governance system, etc.).
 - **Key actors:** names and activities of any relevant internal and external actors present in the area or having an important positive or negative influence on it (e.g., government agencies, NGOs, private companies).
 - **Unit of analysis:** choose your unit of analysis, which will provide the boundaries of your analysis (e.g., it can be the whole PA and its influence zone, parts of it or even several PAs if they share a common management system). If you wish to do so, you can also upload a map of the unit of analysis chosen for future reference.
 - **Status of connectivity:** qualify the connectivity level of your chosen unit (e.g., good connectivity allowing permanent flow of species).



Method > Review available literature, the user's own experience of the area and interviews with key informants who have lived and works in the area covered by the analysis if needed.

- Tips >**
- You can decide on the level of detail to be entered, but generally be as specific as possible to provide a sound basis for the rest of the analysis.
 - While you may know the area well enough to fill in the boxes, it is recommended that you reflect the views of more than one informant to enrich and verify any information.

Step > Identify the Planning Framework

Objective > To summarize key information about the user's project or management plan existing activities

- Process >**
- Enter some **basic information about the project or management plan** you wish to examine through a climate lens. This information includes:
 - **Project or management plan:** select whether you wish to examine a project or a management plan through a climate lens.
 - **Duration:** start date, number of months or years, end date of your project or management plan.
 - **Implementation agency(ies):** Name of the organization(s) or institution(s) implementing the project or management plan.
 - **Vision/Goal:** Enter the overarching aim of your project or management plan.
 - **Objectives:** Enter its objectives.
 - **Sub-objectives or intended results:** enter more specific objectives that your project or management plan may already have. If you have none, you may want to enter stated results instead. You do not need to enter this information if it was never defined for your project or management plan.
 - **Click on the "Add Activity" button to enter up to 20 activities.** You are then asked to describe each project or management plan activity indicating these elements:
 - **Title:** name of the activity
 - **Objective:** list the stated objective(s) of each activity.
 - **Actions:** list the specific actions related to each activity.
 - **Category of the activity:** define the type of activity through the given categories (e.g., activities can aim to raise public awareness of the value of the conservation area or target specific species, infrastructure or aim to contribute to community development). You can select several categories for each activity or type your own category under "other."
 - **Climate-screen this activity:** select which of these activities you want to examine through a climate lens.

The screenshot shows the 'Identify the Planning Framework' step in the 'Community-based Risk Screening Tool - Adaptation and Livelihoods'. The interface includes a sidebar with a table of contents, a main content area with instructions and form fields, and a table at the bottom for adding activities.

Identify the Planning Framework 3 / 15

This step helps you define the conservation planning framework that underpins the analysis. It helps you summarize your existing project or management plan goals, objectives and activities. You should focus on activities that take place within your defined unit of analysis. To help keep the data manageable, you can bundle the activities into categories and select up to 10 activities that you wish to climate-screen.

Unit of Analysis: The entire Nor Yauyos Cochas PA

Do you wish to integrate climate risks into a conservation project or a PA management plan? Project PA Management Plan

Duration of Project or Management Plan
New management plan: 2014-2033

Implementing Agency(ies)
SERNANP and local communities and governments

Vision/Goal
The NYC PA preserves the well-functioning of its ecosystems and watersheds while enabling sustainable use of natural resources. It has a co-management system by 2033 between the state and civil society organizations, who are its users but also responsible for its conservation.

Objectives

- Vegetation communities are conserved (e.g., Polylepis, grassland species, etc.)
- Maintain a stable population of Andes fauna (e.g. vicuña, puma, condor)
- Increase vicuña's population

Sub-Objectives or Intended Results

- restore or improve the condition of 3,000 ha of vegetation (including grasslands)
- practice a sustainable use of vicuña (meat)
- maintain water quality and quantity of watersheds and its associated species

Enter up to 20 project or management plan activities and select up to 10 activities that you wish to climate-screen.

| Title of the Activity #1 | Objective of the activity | Actions to implement the activity | Category of the activity | Climate-screen this activity |
|--------------------------------|------------------------------|--|---|--|
| Sustainable use of vicuña meat | Achieve a sustainable use of | - establish committees of vicuña rearers | <input checked="" type="checkbox"/> Biodiversity conservation | <input checked="" type="checkbox"/> Climate-screen this activity |

Method >

- Review existing **project documents or management plan documents** (e.g., project proposal, logframe, PA management guidelines and annual operation plans).

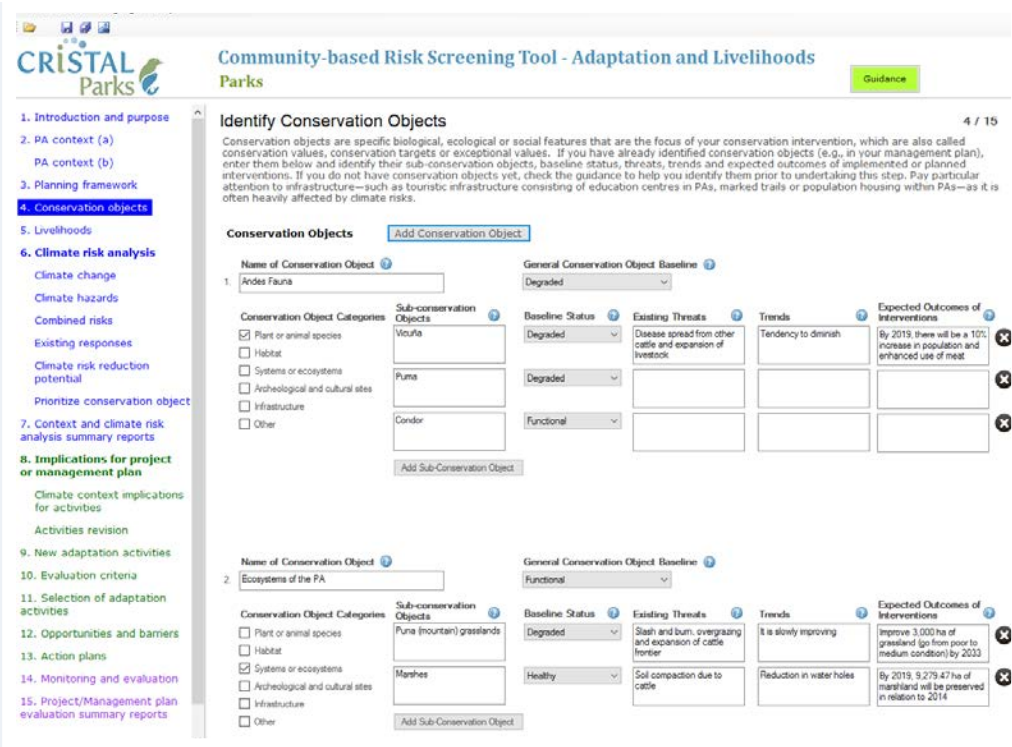
Tips >

- Focus on activities that take place in the area of screening.
 - Make sure sufficient details are entered for each activity, as this will help you screen them at a later stage.
 - You can add activities by clicking on the "Add Activity" button and remove activities by clicking on the X-button.
 - To keep the amount of analyzed data manageable, we have fixed a limit of 20 activities that can be entered in the tool and a maximum of 10 of these activities can be selected for climate screening. If you have many more activities than this, you are encouraged to summarize them into groups of activities.
 - If you do not have any existing activities, make sure to deselect option A on the "Introduction" page and this step will not be shown.
-

Step > Identify Conservation Objects

Objective > To identify the conservation objects and their components, which are the focus of the conservation activities

- Process >**
- Click on the “Add Conservation Object” button to list the **conservation objects** that are the focus of your interventions. Conservation objects refer to the specific ecological or biological features (e.g., species, habitats, ecological processes, or other entities) as well as social targets (e.g., ecotourism, sustainable use of specific resources) that are the focus of the conservation measure.
 - Specify the **type of conservation object** listed using the following categories:
 - **Plant or animal species:** endemic species, endangered species, particular species that are known to be highly sensitive to climate (e.g., black rhino).
 - **Habitats:** particular habitats or habitats and resources vital to maintaining ecological integrity (e.g., deciduous woodland).
 - **Systems or ecosystems:** areas providing essential services such as watersheds providing clean water.
 - **Archeological sites or sites and objects of cultural importance:** sacred sites, archeological sites or even plants or animals valued for their spiritual importance by local communities, or features recognized as World Heritage sites, etc.
 - **Infrastructure:** touristic infrastructure, other park-related infrastructure or even population housing within the PA not captured in one of your defined conservation objects. Certain infrastructure is critical to the functioning of the PA.
 - **Other:** select if one of your conservation objects does not fall into the above categories.
 - For each conservation object, list its components, or **sub-conservation objects**, by clicking on the “Add Sub-Conservation Object” button. These are also called subsidiary targets (such as the specific plants that compose a particular type of forest or the animal species that compose a specific fauna).
 - **Describe each sub-conservation object** providing the following information.
 - **Baseline status:** select the category that best defines the current baseline level of your sub-conservation object from “health” to “highly degraded.”
 - **Existing threats:** human or natural threats that negatively affect your sub-conservation objects (such as overgrazing or slash and burn agriculture threatening grassland ecosystems and animal species they support).
 - **Trends:** the direction and ways in which your sub-conservation object is developing (such as increasing animal populations, decreasing river flow of a certain watershed).
 - **Expected outcomes of interventions:** targets or results expected from existing conservation activities or PA management plans specifically targeting sub-conservation objects. If you do not have existing activities with set targets leave this space blank.
 - Describe the overall conservation object baseline: select an average baseline that qualifies the overall conservation object from individual sub-conservation objects baseline levels.



Method >

- Review **PA management plan documents** for the list of conservation objects and relevant information on them needed for this step.
- If you are revising a project and not a PA management plan, your conservation objects will be what your project aims to protect or improve, available in your **project documents**.
- If no prior conservation objects or equivalent have been identified, make sure you address this step in your organized **participatory stakeholder workshop**. It is key that conservation objects are identified in a participatory manner with all relevant stakeholders and are validated prior to undertaking the rest of the CRISTAL Parks analysis. The following criteria can help you **select your conservation objects** in addition to consulting further references (see further info section):
 - Supports the uniqueness of the PA
 - Good degree of representation of biodiversity
 - Good degree of representation of an ecoregion
 - Feasibility of monitoring
 - Highly threatened, sensitive or endangered
 - Particularly sensitive to climate
 - Particularly sensitive to human use
 - Enhances connectivity
 - Supports integrity
 - Supports people (local communities)
 - Archaeological or historical site, cultural site

Further info >

- For understanding and identifying **conservation objects** consult: L. Thomas & J. Middleton. (2003). *Guidelines for management planning of protected areas*. Switzerland and Cambridge, UK: IUCN Gland; The Nature Conservancy. (2007). *Conservation action planning handbook: Developing strategies, taking action and measuring success at any scale*. Arlington, VA: The Nature Conservancy. Retrieved from <https://www.conservationgateway.org/ConservationPlanning/ActionPlanning/Pages/conservation-action-plann.aspx>

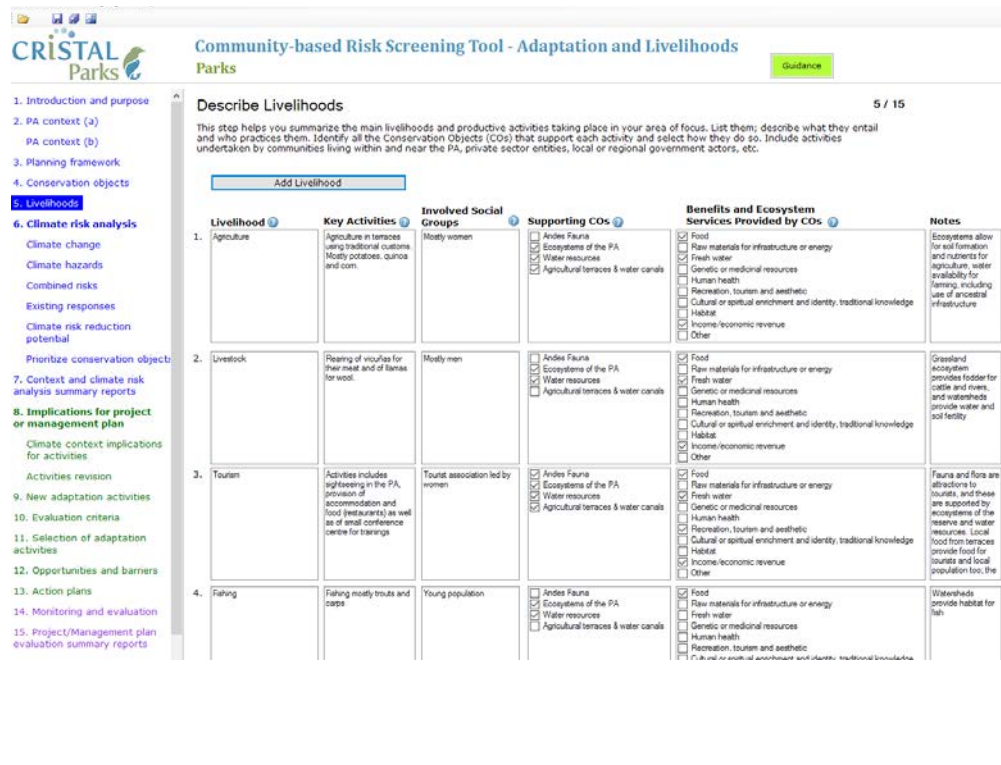
Step > Describe Livelihoods

Objective > To identify the main livelihoods of communities living in/around the focus area and describe how conservation objects supports these livelihoods.

Process >

- Click on the “Add Livelihood” button to list the **main livelihoods** activities practiced in the communities living in or around the focus area (e.g., subsistence farming, fishing, tourism). You can enter up to five livelihoods. Describe each livelihood by providing information on:
 - **Key activities:** activities of the livelihood (e.g., diving, sightseeing and guided tours for tourism livelihood).
 - **Involved social groups:** the number and types of social groups who are involved in these activities (e.g., PA staff and mostly women are involved in tourism).
- Select which previously identified conservation objects support each livelihood and how they do so.
 - **Supporting conservation objects:** click on all relevant conservation objects that render livelihood activities possible (e.g., coral reefs provide a habitat for fish that are fished and sites for diving). These are often referred to as ecosystem services or conservation object benefits in the tool.
 - **Benefits and ecosystem services provided by conservation objects:** Select all relevant benefit categories that best describe how conservation objects enable livelihoods. These categories² include:
 - » **Food:** Terrestrial ecosystems provide the conditions for growing food, but marine and freshwater systems or forests also provide food for human consumption.
 - » **Raw material for infrastructure or energy:** Ecosystems provide a great diversity of materials for construction and fuel, including wood, biofuels and plant oils that are directly derived from wild and cultivated plant species.
 - » **Fresh water:** Ecosystems play a vital role in the global hydrological cycle, as they regulate the flow and purification of water. Vegetation and forests influence the quantity of water available locally.
 - » **Genetic or medicinal resources:** Ecosystems and biodiversity provide many plants used as traditional medicines as well as providing the raw materials for the pharmaceutical industry. All ecosystems are a potential source of medicinal resources. High genetic diversity, meaning the variety of genes between and within species populations, is also often synonymous with higher resilience.
 - » **Human health:** Walking and playing sports in green spaces are not only good forms of physical exercise, they also let people relax and play a role in maintaining mental and physical health.
 - » **Recreation, tourism and aesthetic:** Ecosystems and biodiversity play an important role for many kinds of tourism, which in turn provides considerable economic benefits and a vital source of income for many countries.
 - » **Cultural or spiritual enrichment and identity, traditional knowledge:** In many parts of the world, natural features such as specific forests, caves or mountains are considered sacred or have a religious meaning. Nature is a common element of all major religions and traditional knowledge, and associated customs are important for creating a sense of belonging. Moreover, biodiversity and natural landscapes are also a source of inspiration for arts, culture and, increasingly, for science.
 - » **Habitat:** Habitats provide everything that an individual plant or animal needs to survive: food, water and shelter. Each ecosystem provides different habitats that can be essential for a species' life cycle.
 - » **Income/economic revenue:** Any of the above can be seen as providing economic revenue, meaning a source of income.
 - » **Other:** select if none of the above help define how the conservation objects benefit the livelihood
 - **Notes:** If needed, you can provide here additional details on how a conservation object benefits livelihoods.

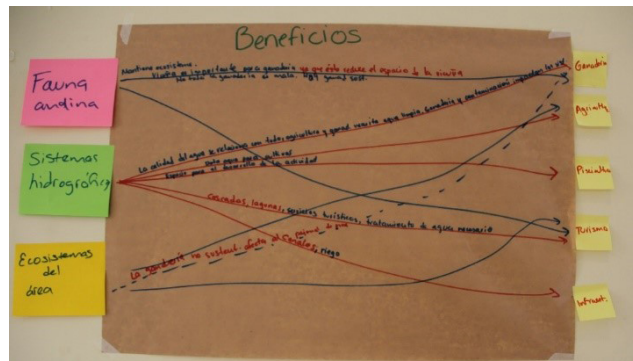
² Modified from *The Economics of Ecosystems & Biodiversity* (n.d.) and chapter 1 of the *Millennium Ecosystem Assessment* (2003).



Method >

- **Participatory Stakeholder Workshop Resource Map:** to identify the main livelihoods, ask participants to draw a resource map by:
 - Drawing a **map of the focus area** (conservation zone and surrounding communities, e.g., on a flip chart using coloured markers, or drawing on top of conservation area existing maps if they comprise broader area).
 - Drawing on the map the **PA boundaries, the key resources** they use and for what purpose or livelihood activity, and discuss who undertakes these activities (e.g., crops, livestock, houses, forested areas, education centres, water bodies, humans, etc.). Include a legend if symbols are used.
- **Benefits web:** to identify conservation object benefits supporting livelihoods:
 - Ask some participants to stand on one side of the room; each will represent a conservation object and/or its sub-objects, depending on the number of participants.
 - Ask other participants to stand on the other side of the room; each will represent one livelihood group.
 - Have one person that takes notes on the discussion.
 - Begin the discussion about how each participant of the first group enables or benefits the participants of the other group (i.e., the different livelihoods). This will help participants select the “supporting conservation objects.”
 - Ask how it is that they provide these benefits, answering the questions: “How do the conservation objects support the activity?” or “Which ecosystem services are required to enable that activity?” For example, wetlands—a conservation object—can provide breeding grounds for fish, thereby supporting the productive activity of fishing.
 - For each point the person discusses on the nature of the benefit or service and its pathway, the person throws or passes a string to the other group’s person.
 - At the end of this exercise, you will have a web of strings or ropes each corresponding to a benefit and its pathway. The more ropes one conservation object has, the more benefits it represents to certain activities.
- **Benefits diagram:** to facilitate note-taking of your benefits web:
 - On the left side, put all the conservation objects and their sub-objects in sticky notes; on the right side, put all the livelihoods in different coloured sticky notes.
 - Retrace benefits discussed in the benefits web exercise in your diagram. Be aware that one conservation object can support several livelihoods at the same time, while different conservation objects can support the same livelihood.

- Finally, identify to what type of benefits they refer to (i.e., which ecosystem services are provided for each livelihood), following the given categories (see above).



Left: Benefits web (CRISTAL Parks implementation in PA Bahía de Loreto, Mexico, 2014). Right: Benefits diagram (CRISTAL Parks implementation in PA Nor-Yauyos Cochabamba, Peru, 2015). Photos: Alicia Natalia Zamudio.

Tips >

- To realize the above dynamic exercises in your participatory stakeholder workshop, ensure that participants represent all main stakeholders.
- Before organizing a participatory stakeholder workshop, review what resources are required in Table 2, [page 13](#).
- During the workshop, be sure to set up rules of good participation, explain clearly the aim and methodology of each participatory exercise and leave enough time for facilitated discussions.

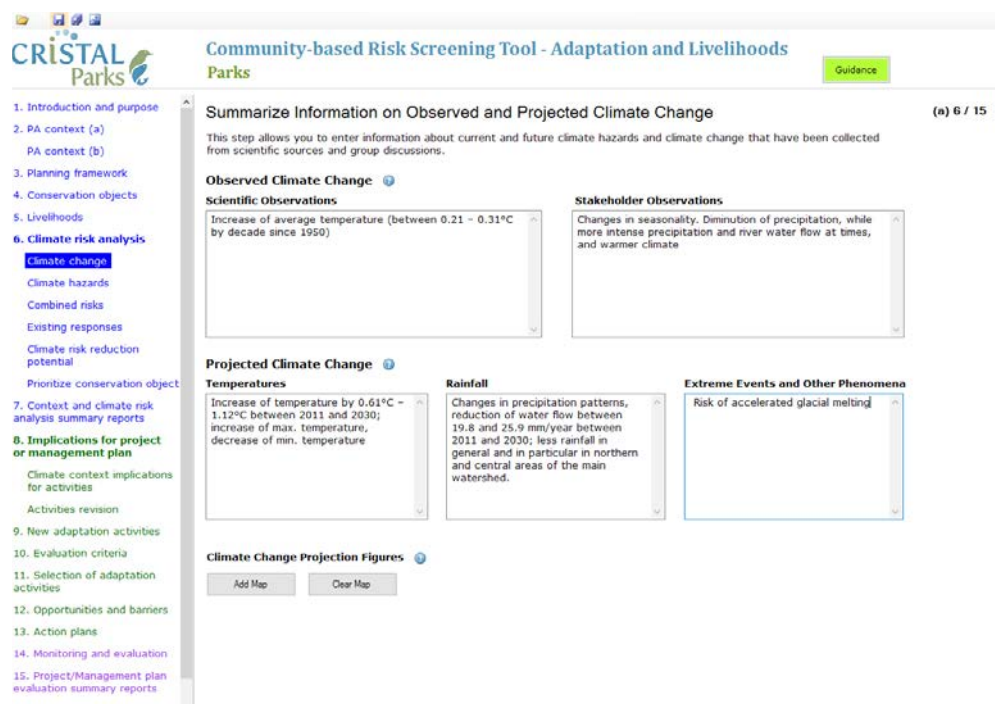
Further info >

- **Resource and hazard mapping:** Consult Field Guide 2 on page 33 of: CARE. (2009). Climate Vulnerability and Capacity (CVCA) Handbook. Retrieved from http://careclimatechange.org/wp-content/uploads/2014/12/CVCA_EN.pdf
- **Ecosystems services to livelihoods:** Consult E. Carabine, C. Cabot Venton, T. Tanner and A. Bahadur. (2015). *The Contribution of Ecosystem Services to Human Resilience: A Rapid Review*. Overseas Development Institute (ODI), UK. Retrieved from <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9394.pdf> or TESSA Tools (n.d.). Toolkit for Ecosystem Service Site-based Assessment (TESSA). Retrieved from <http://tessa.tools/>

Step > Summarize Information on Observed and Projected Climate Change

Objective > To summarize information about observed and projected climate change in the focus area.

- Process >**
- Enter information about climate change in the area accordingly:
 - **Observed climate change (current):** information on past changes in climate conditions and extremes that have occurred over the past decades in the user's country or focus area based on (i) scientific sources and (ii) discussions with stakeholder during the workshop.
 - **Projected climate change (future):** information about future changes in temperature, rainfall, extreme events and any other important phenomena (e.g., glacier retreat and sea level rise) based on scientific sources only.
 - Compare the information on observed climate changes from scientific sources and the stakeholders' observations. While the former is often available only for larger scales, stakeholders' observations allow you to validate these larger trends and to understand the local perceptions of how the climate has been changing.



CRISTAL Parks Community-based Risk Screening Tool - Adaptation and Livelihoods Guidance

1. Introduction and purpose
2. PA context (a)
PA context (b)
3. Planning framework
4. Conservation objects
5. Livelihoods
6. Climate risk analysis
Climate change
Climate hazards
Combined risks
Existing responses
Climate risk reduction potential
Prioritize conservation object
7. Context and climate risk analysis summary reports
8. Implications for project or management plan
Climate context implications for activities
Activities revision
9. New adaptation activities
10. Evaluation criteria
11. Selection of adaptation activities
12. Opportunities and barriers
13. Action plans
14. Monitoring and evaluation
15. Project/Management plan evaluation summary reports

Summarize Information on Observed and Projected Climate Change (6 / 15)

This step allows you to enter information about current and future climate hazards and climate change that have been collected from scientific sources and group discussions.

Observed Climate Change

Scientific Observations
Increase of average temperature (between 0.21 - 0.31°C by decade since 1950)

Stakeholder Observations
Changes in seasonality, Diminution of precipitation, while more intense precipitation and river water flow at times, and warmer climate

Projected Climate Change

Temperatures
Increase of temperature by 0.61°C - 1.12°C between 2011 and 2030; increase of max. temperature; decrease of min. temperature

Rainfall
Changes in precipitation patterns, reduction of water flow between 19.8 and 25.9 mm/year between 2011 and 2030; less rainfall in general and in particular in northern and central areas of the main watershed.

Extreme Events and Other Phenomena
Risk of accelerated glacial melting

Climate Change Projection Figures
Add Map Clear Map

- Method >**
- **Participatory stakeholder workshop:** We recommend that you discuss observations about past climatic changes when doing the **resource and hazard mapping** exercise (see method described in the next step, "Climate Hazards").
 - **Literature review:** review available research on climate change projections in the region of interest (see list of selected key references in the "Further Info" section below).

Tips >

- **Dealing with uncertainties in future climate projections:** Climate projections are often based on imperfect climate models and on development scenarios that are inherently uncertain. We therefore recommend that you compare different sources and look for projections that are based on different models and scenarios. Also, make sure to note any uncertainty ranges that are mentioned in the projections (e.g., a projected 3°C temperature rise by 2050 may come with an uncertainty range of 1.5°C to 5°C; average rainfall projections may be negative, but the uncertainty range can be from +20 per cent to -50 per cent; extreme event projections are often even more uncertain).

Further info >

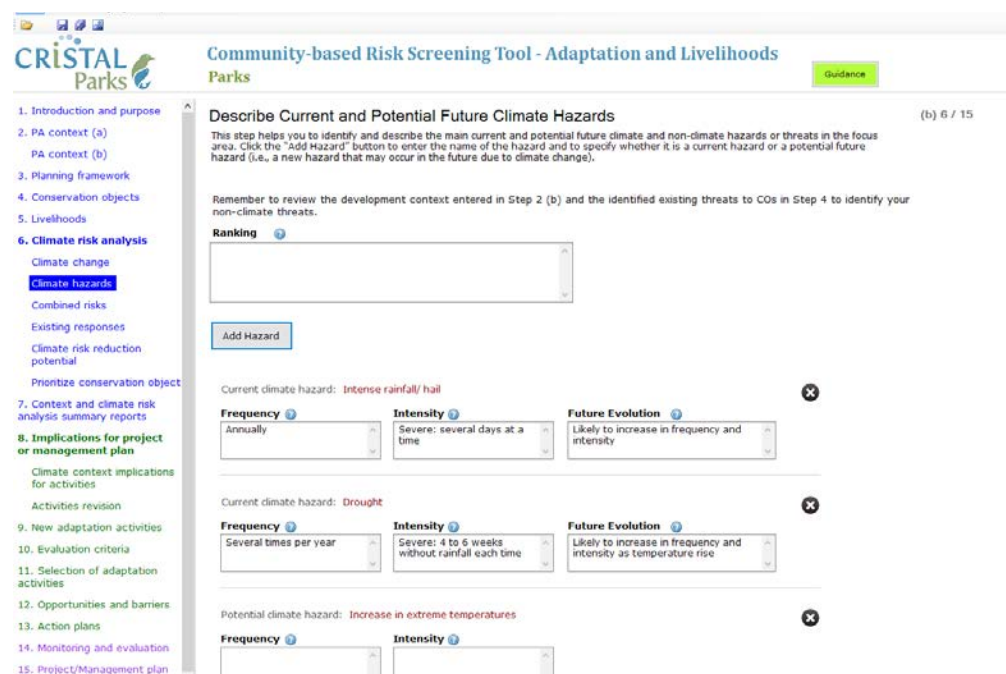
- **Intergovernmental Panel on Climate Change reports:** These summarize the current knowledge on climate change and its impacts by region and for ecological zones. (<https://www.ipcc.ch/report/ar5/wg2/>)
- **United Nations Framework Convention on Climate Change (UNFCCC) National Communications:** These documents are prepared by signatory parties to the UNFCCC, and communicate the results of national assessments of greenhouse gas emissions, as well as information on vulnerability, impacts and adaptation. Observed and anticipated trends and impacts of climate change for users' countries can be drawn from these documents. (http://unfccc.int/national_reports/non-annex_i_natcom/submitted_natcom/items/653.php and http://unfccc.int/national_reports/annex_i_natcom/submitted_natcom/items/4903.php)
- The **World Bank Climate Change Knowledge Portal:** This platform provides an online tool for access to comprehensive global, regional and country data related to historical, current and future climate impact and vulnerability. (<http://sdwebx.worldbank.org/climateportal/index.cfm>)
- **Climate Wizard** provides climate change information and visualizes the impacts anywhere on Earth. (www.climatewizard.org)
- The **Adaptation Learning Mechanism** provides country summaries on observed and projected climate change and impacts. (www.adaptationlearning.net)
- The **Climate Information Portal (CIP)** is a web interface that offers a wealth of observational climate data and projections of future climate, as well as guidance documents on using climate information (<http://cip.csag.uct.ac.za/webclient2/app/>)
- The **Climate Change Knowledge Navigator and Widget** helps users search for the most relevant online climate knowledge platform (<http://kn.ids.ac.uk>)

There are many other relevant sources of information, often region- or country-specific, which we cannot list here. Make sure to search the Internet thoroughly and to consult local experts.

Step > Describe Current and Potential Future Climate Hazards

Objective > To identify and describe the main current and potential future climate hazards as well as non-climatic threats in the focus area.

- Process >**
- Click the “Add Hazard” button to enter the key climate hazards in the user’s project area. You will then be asked to enter the hazard and to specify if this is a current hazard (i.e., that participants at the stakeholder workshop are currently experiencing) or if this is a potential climate hazard (i.e., a new climate hazard that may occur in the future due to climate change).
 - **Climate hazard** refers to “a potentially damaging hydro-meteorological event or phenomenon; they can be events that have an identifiable onset and termination, such as a storm, flood or drought, as well as more permanent changes, such as shift from one climatic state to another” (UNDP, 2005).
 - For each climate hazard selected, you will then be asked to specify:
 - Its **frequency**: how often a hazard occurs (e.g., once every year, twice a decade).
 - Its **intensity**: how “strong” the hazard is when it occurs (for examples, see the “Tips” section below).
 - Its future **evolution under climate change**: anticipated changes in the location, duration, frequency and intensity of the hazard under climate change (e.g., storms are likely to occur less often but to become more intense in a specific area).
 - Describe briefly other **non-climate hazards** mentioned by the participants of the stakeholder workshop (e.g., earthquake, volcanoes, diseases).



CRISTAL Parks Community-based Risk Screening Tool - Adaptation and Livelihoods

Guidance

(b) 6 / 15

Describe Current and Potential Future Climate Hazards

This step helps you to identify and describe the main current and potential future climate and non-climate hazards or threats in the focus area. Click the “Add Hazard” button to enter the name of the hazard and to specify whether it is a current hazard or a potential future hazard (i.e., a new hazard that may occur in the future due to climate change).

Remember to review the development context entered in Step 2 (b) and the identified existing threats to COs in Step 4 to identify your non-climate threats.

Ranking

Add Hazard

Current climate hazard: Intense rainfall/ hail

Frequency: Annually Intensity: Severe: several days at a time Future Evolution: Likely to increase in frequency and intensity

Current climate hazard: Drought

Frequency: Several times per year Intensity: Severe: 4 to 6 weeks without rainfall each time Future Evolution: Likely to increase in frequency and intensity as temperature rise

Potential climate hazard: Increase in extreme temperatures

Frequency: Intensity:

- Method >**
- **Current climate and non-climate hazards:** This information should be mostly gathered through discussions during the participatory stakeholder workshop. We recommend that you conduct a **resource and hazard mapping exercise**. Divide the participants in two groups if you are many to facilitate work:

- The first part of the resource and hazard mapping exercise is about drawing a map that identifies the boundaries and the key resources used by stakeholders representing all communities living the focus area. Further details on how to do this are explained under the previous "Livelihoods" step.
- Once the participants have finalized this map, you can start the discussion around key hazards that have affected them and the PA in the past. Hazards may be natural or manmade. Do not limit the discussion to only climate-related hazards. This will clarify the importance of climate hazards compared to other risks. It may well be that climate hazards are not the most important hazards in the area.
- Ask the participants to identify those hazards that are related to climate. While the tool allows users to enter up to 10 climate hazards, we recommend users prioritize hazards. Ask participants to prioritize the three hazards that have the greatest impact on their livelihoods and on the conservation object benefits or ecosystem services that support these livelihoods.
- Ask participants how often each of the three hazards occurs (several times a year, once a year, every five years, etc.) and how intense a typical occurrence is (i.e., short, long, severe, moderate, etc.). Ask them whether the frequency or intensity has changed over the past years and decades and ask them to explain how. If needed, agree on a ranking for frequency and intensity and enter that information in the first ranking box.
- Ask the participants to draw on the map where these hazards are occurring (showing which resources are affected). Hazards that are not location-specific can be noted on the side.
- When discussing climate hazards, you may also want to ask the participants about observed climate changes over the past decades. This information can be filled into the respective box in the previous step ("Climate Change").

- Information about potential hazards and future evolution under climate change:** Since stakeholders are most likely not aware of new and changing future threats, it is recommended that you gather this information from the **scientific sources** provided in the previous step, "Climate Change."



Hazard Map from Northern Ghana. Photo: Angie Dazé. Source: Dazé, Ambrose & Ehrhart, 2009.

Tips >

- Links between climate and non-climate hazards:** Make sure to differentiate climate hazards from other hazards and to explore the potential linkages between the two.
 - Climate hazards (e.g., droughts, floods, rising temperatures) can influence other non-climate hazards, including biological hazards such as insects or other animal plagues and infestations; technological hazards such as industrial pollution, transport accidents, fires, etc.; and human health hazards such as waterborne diseases.
 - Participants may mention scarcity of resources, such as "lack of money," as some of the main threats or stresses they are facing. In this case, it should be determined whether the lack of a resource (in this example, financial resources) is the result of a climate hazard or any other hazard or combination of hazards.
- Distinguish the cause(s) from the consequence(s):** Make sure that the issues identified are actual hazards and not conditions such as "food insecurity." It is the role of the facilitator to ask the participants to break down these conditions to determine if they are caused by climate hazards. For example, food insecurity may be the result of a drought, which is a climate hazard, or it may be the result of governance issues. Alternatively, food insecurity may be the result of a combination of both successive droughts and governance issues.
- Be as specific as possible when characterizing the frequency and intensity of a climate hazard in the focus area** so that any outsider who is not familiar with the local context can understand what is meant. For example, what may be perceived and experienced as a "strong" flood in a specific area may be defined differently in another context. You are invited to enter the range you use for qualifying frequency and intensity in the first text box of this step.

Table 3: Examples of frequency and intensity of climate hazards

| Examples | General description | Detailed, more useful description |
|------------------|--------------------------|--|
| Frequency | "Rare flooding event" | "Once a year" |
| | "More frequent droughts" | "Forty years ago, droughts used to occur once every 5 years but in the last decade, droughts are occurring once a year or so." |
| Intensity | "Extreme flood" | "Floods the entire lowland area of the protected area and all communities living nearby" "River level increased one metre and floods nearby fields for a few weeks" |
| | "Moderate drought" | "Two to three weeks without rainfall and unusually warm temperatures" |

Intensity refers to the magnitude of the hazard over a given period of time (e.g., speed of wind, height of flood, amount of rain falling in an hour). When describing the intensity of a climate hazard in a specific place, avoid focusing on the details of the impacts (i.e., how much damage is caused), as it is the focus on the next step.

Further info >

- **Hazard mapping:** Consult Field Guide 2 on page 33 of CARE. (2009). Climate Vulnerability and Capacity (CVCA) Handbook. Retrieved from http://careclimatechange.org/wp-content/uploads/2014/12/CVCA_EN.pdf

Step > Analyze Climate Risk

Objective > To understand the impacts of current and potential future climate hazards on conservation objects, their benefits or ecosystem services to livelihoods.

- Process >**
- Enter information about the impacts of climate hazards in the PA and surrounding communities. For each current and future potential climate hazard identified in the previous step, identify:
 - **Direct impacts:** The immediate effects, positive and/or negative, of a climate hazard on conservation objects and sub-conservation objects (see examples in the “Tips” section).
 - **Indirect impacts:** The positive and/or negative consequences of the direct impacts on the conservation objects or sub-objects benefits pathways or ecosystem services supporting the livelihoods (see examples in the “Tips” section).
 - **Other causes of impacts:** Other factors that contribute to the severity of direct and indirect impacts (e.g., soil erosion contributing to crop loss). This is important to note because other non-climatic trends and changes (e.g., poverty, environmental degradation) may exacerbate the negative impacts of climate hazards on conservation objects and their benefits. The tool automatically copies the non-climate hazards in this step for your review.
 - **Conservation object exposure:** Exposure to climate hazards represent the number of people and types of assets—here conservation objects—present in climate hazard-prone areas (adapted from UNISDR, 2009). Select the appropriate exposure level for each conservation object.
 - **Conservation object sensitivity:** Sensitivity is the degree to which people and assets—here conservation objects and their benefits—are affected, negatively or positively, by direct and indirect impacts (adapted from IPCC, 2007). Select the appropriate sensitivity degree for each conservation object and its benefits or ecosystem services.

Community-based Risk Screening Tool - Adaptation and Livelihoods

Analyze Climate Risk (c) 6 / 15

This step helps you understand and describe the direct and indirect impacts of hazards on the conservation objects and the benefits they provide to livelihoods. Describe these impacts. It also helps you identify the potential factors that could amplify or buffer these impacts, informed by the non-climate hazards listed and previous information on the context and CO threats. Then rank the sensitivity of each CO on a scale of "very high sensitivity (or heavily impacted)" to "very low sensitivity" based on each hazard and the identified impacts.

Non-climate hazards
Loss of traditional knowledge, especially agriculture; increase in domestic livestock; expansion of livestock frontier; uncontrolled tourism; migration; burning; and mining

Current climate hazard: Intense rainfall/ hail

| Conservation Object | Sub-Conservation Objects | General Baseline Condition of the CO | CO Exposure | Direct Impacts on the CO | Indirect Impact | Other Causes of Impacts | CO Sensitivity |
|------------------------------------|---|--------------------------------------|-------------|---|---|---------------------------------|----------------|
| Andes Fauna | 1. Vicuña 2. Puma 3. Condor | Degraded | Medium | Due to snow, restricted areas for grazing, less fodder for vicuña and livestock, which can | Can lead to losses of livestock and loss of food and revenue for humans | | High |
| Ecosystems of the PA | 1. Puna (mountain) grasslands 2. Marshes | Functional | High | Erosion of Puna grasslands and destruction of vegetation | Lead to loss of fodder for animals | Low or lack of vegetation cover | Medium |
| Water resources | 1. Lakes, rivers and dikes 2. Glaciers | Degraded | High | Landslides | | | Medium |
| Agricultural terraces water canals | 1. Agricultural terraces 2. Water canals other agricultural infrastructure | Functional | Very high | Landslides, destruction or deterioration of water infrastructure, including irrigation infrastructure | Blocked access to markets | | Very high |

Current climate hazard: Drought

| Conservation Object | Sub-Conservation Objects | General Baseline Condition of the CO | CO Exposure | Direct Impacts on the CO | Indirect Impact | Other Causes of Impacts | CO Sensitivity |
|---------------------|--------------------------|--------------------------------------|-------------|--------------------------|-----------------|-------------------------|----------------|
|---------------------|--------------------------|--------------------------------------|-------------|--------------------------|-----------------|-------------------------|----------------|

Method >

Participatory Stakeholder Workshop: We recommend starting with a discussion about the impacts on the conservation objects and their benefits using the benefits diagram from previous “Livelihoods” step and then use a vulnerability matrix exercise to identify the most climate-sensitive conservation objects.

• Discussion on climate impacts using the benefits diagram:

1. Refer to the priority hazards identified under the previous step and ask the participants to identify the direct impacts of each hazard on the conservation objects and their sub-objects, keeping in mind the way they provide benefits to the livelihoods.
2. Ask participants to identify the indirect impacts that follow the direct impacts (minimum one main indirect impact per direct impact). While sometimes the impacts might directly affect the conservation or its sub-objects, other times the impact is felt indirectly on the benefits pathway or ecosystem service, which we refer to as indirect impact.

Examples of direct and indirect impacts on conservation objects and their benefits:

- Hurricane (hazard) => destruction of mangroves (direct impact on conservation object of mangroves) => loss of natural barrier against storm surges and loss of fish and birds habitat (indirect impact on conservation object benefits/ecosystem services) => destruction of fishermen's homes near the shore (indirect impact on fishing livelihood).
- Drought (hazard) => trees and grassland dying (direct impact on conservation object grassland) => soil degradation (indirect impact on conservation object benefit of soil fertility and food) => death or diseases to cattle and wildlife herbivores which leads to income loss for farmers and tourist guides (indirect impact on farming and tourism livelihoods).

3. Ask participants about what other factors might contribute the impacts, apart from the climatic hazard. For example, loss of income due to soil degradation and loss of grassland provoked by droughts would not occur or be less intense if large parts of land was not burnt for agriculture. Non-climate hazards previously identified in the “Climate Hazards” step are retaken in the tool in this step to remind you of potential **“other causes of impacts.”**

4. Once the diagram is finalized, ask participants to evaluate to what degree the conservation objects and sub-objects are **exposed** to the hazards, from very high to very low or no exposure at all.

For this exercise, you may use sticky notes for each direct and indirect impact and other causes, and put the notes in the right place on the same **benefits diagram** drawn in the “Livelihoods” step. If your diagram is not big enough, you can also use sticky notes to identify the direct and indirect impacts against a wall or paper (see the two figures below for examples of how to collect this information).

The participants may not be able to identify impacts of potential future hazards easily, as they have not occurred yet. It is nevertheless worthwhile to discuss the potential direct and indirect impacts of such future hazards with them.



Left: Benefits Diagram with Impacts Listed (CRISTAL Parks application in PA Bahía de Loreto, Mexico, 2014). Right: Hazards and Impacts Identification (CRISTAL Parks implementation in PA Nor-Yauyos Cochas, Peru, 2015). Photos: Alicia Natalia Zamudio.

- **Identification of the most climate-sensitive conservation objects using a vulnerability matrix:**
 1. Prepare a matrix on a flipchart, with all the conservation objects on the left-hand column. Put the prioritized climate hazards in the top column.
 2. Ask the participants to score the impacts of each hazard on each conservation object (keeping in mind their sub-objects and their benefits) according to the legend indicated in Table 4. You can also use a different scoring system if you wish.
 3. It is important to facilitate a discussion in which the participants come to a consensus as to how to score the impacts. If a consensus cannot be reached, undertake a voting exercise if necessary. The note taker should note the most important disagreements. The sensitivity ranking will be re-used in further steps to help you prioritize the conservation objects that need to be supported by activities.
 4. Repeat the same exercise for your potential hazards.
 5. To transfer the results to CRISTAL Parks, select the appropriate level of sensitivity in the last column, from very high sensitivity to none, by looking at your vulnerability matrix results and the status of your conservation objects baseline.

Table 4: Example of a vulnerability matrix

| Conservation objects | Hail | Intense rainfall | Droughts | |
|--|------|------------------|----------|--|
| Andes Fauna (vicuña, puma, condor) | 3 | 1 | 3 | 3 = high negative impact 2 = medium negative impact 1 = small negative impact 0 = no impact X = positive impact |
| Ecosystems of the PA (grasslands) | 2 | 3 | 3 | |
| Water resources (rivers, lakes, glaciers) | 0 | 2 | 3 | |
| Agricultural terraces (terraces, water canals and other agricultural infrastructure) | 3 | 3 | 3 | |

Further info >

- **Vulnerability matrix:** Consult Field Guide 5 on page 39 of CARE. (2009). *Climate Vulnerability and Capacity (CVCA) Handbook*. Retrieved from http://careclimatechange.org/wp-content/uploads/2014/12/CVCA_EN.pdf
- **Social vulnerability analysis:** Consult the Comisión Nacional de Areas Naturales Protegidas, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) & GmbH (2014). *Toolkit for the Analysis of Social Vulnerability to the Effects of Climate Change*. Retrieved from http://cambioclimatico.conanp.gob.mx/documentos/Vulnerability_Toolkit_Summary_ENG.PDF

Step > Identify and Assess Existing Responses

Objective > To identify existing and sustainable response strategies for the climate impacts on conservation objects and their benefits to livelihoods

- Process >** Enter information about current and alternative response strategies according to the key impacts identified in the previous step.
- **Current response strategy/ies:** identify the current response strategy/ies for each combination of direct and indirect impacts.
 - **Actors involved:** identify all the persons involved in the implementation of the current response strategies.
 - **Sustainability:** describe whether the stakeholders consider the strategy/ies sustainable or not by choosing either “yes” or “no” from the drop-down menu. A strategy is not sustainable if it negatively affects any of these three aspects of sustainability: environmental, social and economic. For example, if it leaves conservation objects and individuals, groups or entire communities worse off in the long term (e.g., putting sandbags to stop overflow from rivers is not sustainable in the long term, as river flow keeps rising during intense rainfall events).
 - **Alternative strategies:** in case some response strategies are not sustainable, identify potential alternative strategies. Alternative strategies are proposed by the stakeholders, although they are not in a position to implement them now (otherwise they would have mentioned them under current response strategy).
 - **Evolution:** identify how each current or alternative response strategy might need to evolve given projected changes in climatic conditions.

Community-based Risk Screening Tool - Adaptation and Livelihoods

Identify and Assess Existing Responses (d) 6 / 15

This step helps you identify current and potential sustainable responses to the impacts previously described.

Current climate hazard: Intense rainfall/ hail

| Conservation Object | Combined Impacts | Current Response Strategy | Actors Involved | Is the response strategy sustainable? | Alternative Response Strategy | Evolution of Strategy Under Climate Change |
|------------------------------------|--|--|----------------------------|---------------------------------------|---|--|
| Andes Fauna | Due to snow, restricted areas for grazing/less fodder for vouña and livestock, which can lead to animal migration. | Livestock planning: reduce overgrazing, which increases vegetation cover that buffers against intense rainfall/floods, reduces | Livestock rearsers | Yes | | |
| Ecosystems of the PA | Erosion of Puna grasslands and destruction of vegetation Lead to loss of fodder for | Livestock planning: reduce overgrazing which increases vegetation cover that buffers against intense rainfall/floods, reduces | Livestock rearsers | Yes | | |
| Water resources | Landslides | Sandbags to stop water - involve civil defence committee | Civil defense, communities | No | Prevention strategy by cleaning rivers and canals (irrigation), increase awareness of population, increase vegetation cover | |
| Agricultural terraces water canals | Landslides: destruction or deterioration of water infrastructure, including irrigation infrastructure and access roads | Use traditional knowledge and maintain traditional infrastructure to store water | Traditional farmers | No | Tap into traditional knowledge for more hail-resistant crops | |

Current climate hazard: Drought

| Conservation Object | Combined Impacts | Current Response Strategy | Actors Involved | Is the response strategy sustainable? | Alternative Response Strategy | Evolution of Strategy Under Climate Change |
|---------------------|--|---------------------------|-----------------|---------------------------------------|-------------------------------|--|
| Andes Fauna | Increase in pests due to higher temperature entrance of livestock in wider areas affecting vouñas | | | | | |

Method >

Participatory stakeholder workshop: We recommend that users link the discussion on response strategies to the exercises on climate impacts in the previous step.

1. Start the discussion by referring to each set of direct and indirect climate impacts, and ask the participants what their main response strategy is (you can add more than one if there are several main strategies, but make sure not to list more than three).
2. Discuss who is implementing these response strategies (e.g., which livelihood group is predominantly using a specific response). Many livelihood groups can use the same response and, likewise, one group can use more than one response. Space is provided under "Actors involved" to record that information.
3. Next, discuss with them whether they consider the different strategies sustainable or not and select "yes" or "no" in the tool.
4. For any unsustainable strategy, ask the participants to identify an alternative strategy that they would consider sustainable. They are typically not able to implement such strategies currently.
5. Next, ask if any adjustments will need to be made to the response strategy considering future changes in the climate (for example, sandbags may need to be complemented by mangrove ecosystem restoration strategies in the future if more hurricanes and heavy rainfall events are projected). See information entered in previous "Climate Change" step if needed.
6. Repeat the same exercise for potential responses to future anticipated impacts.

Tips>

You can add more than one response strategy in the boxes, but try to prioritize a maximum of three responses strategies to keep the level of information manageable in the following steps.

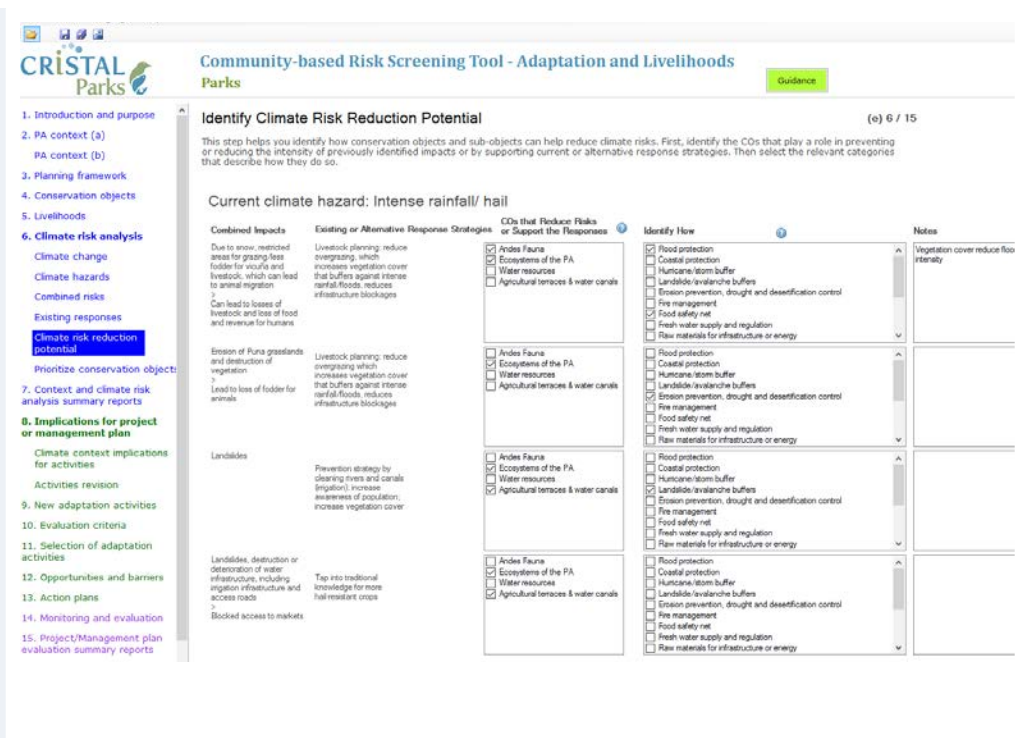
Step > Identify Climate Risk Reduction Potential

Objective > Identify how conservation objects and the benefits or ecosystem services they provide can help reduce identified climate risks by reducing the impacts or by supporting the response strategies

- Process >** Enter information about each conservation object and how they help reduce climate risks by either reducing climate impacts identified or supporting response strategies identified in previous steps.
- Conservation objects that reduce risks or support the responses: select all applicable conservation objects
 - Identify how: describe how the conservation objects help reduce climate risks by selecting relevant categories of risk reduction potential:³
 - **Flood protection:** Ecosystems such as wetlands, marshes, peat bogs, lakes, mangroves, swamp forests and coral reefs absorb and reduce water flow and provide space for water spill.
 - **Coastal protection:** Mangroves, coral reefs, sand dunes, coastal marshes and barrier islands for example create physical barriers against tidal waves, storm surges and sea-level rise, slowing down the intensity and providing space for tidal overflows.
 - **Hurricane, storm buffer:** Mangroves, coral reefs, barrier islands and forests, for example, can act as buffers against direct physical damages caused by hurricanes.
 - **Landslide, avalanche prevention:** Forests on or beneath steep slopes, for example, can act as buffers against earth movements or snow movements and stabilize soils.
 - **Erosion prevention, drought and desertification control:** Drylands can, for example, help maintain drought-resistant plants, slowing down desertification and degradation of land processes through vegetation cover, and preventing soil erosion.
 - **Fire management:** Wetlands, savannah, dry and temperate forests and scrub can, for example, help maintain natural fire resistance and its management systems, providing space for refugia.
 - Use categories of conservation object benefits from the “Livelihoods” step to describe how conservation objects can more directly support response strategies by, for example, increasing adaptive capacity of people:
 - **Food safety net:** Dryland habitats, some grasslands, forests and coral reefs can, for example, provide food for humans or forage for animals (e.g., fish, game), non-timber forest products, grazing areas, maintaining drought-resistant plants, and maintaining genetic diversity (e.g., crops).
 - **Freshwater supply and regulation:** Cloud forest, mature forests, catchment areas and glaciers can, for example, supply fresh water, purify that water and help regulate water flows as well as regenerate that water through groundwater recharges.
 - **Raw material for infrastructure or energy:** Ecosystems provide a great diversity of materials for construction and fuel, including wood, biofuels and plant oils that are directly derived from wild and cultivated plant species.
 - **Genetic or medicinal resources:** Ecosystems and biodiversity provide many plants used as traditional medicines and provide the raw materials for the pharmaceutical industry. All ecosystems are a potential source of medicinal resources. High genetic diversity, meaning the variety of genes between and within species populations, is also often synonymous with higher resilience.
 - **Human health:** Walking and playing sports in green spaces are not only good forms of physical exercise, but they also let people relax and play a role in maintaining mental and physical health.
 - **Recreation, tourism and aesthetic:** Ecosystems and biodiversity play important roles for many kinds of tourism, which in turn provides considerable economic benefits and a vital source of income for many countries.

³ Modified from International Union for Conservation of Nature, World Commission on Protected Areas & Keidanren Nature Conservation Fund. (n.d.).

- **Cultural or spiritual enrichment and identity, traditional knowledge:** In many parts of the world, natural features such as specific forests, caves or mountains are considered sacred or have a religious meaning. Nature is a common element of all major religions and traditional knowledge, and associated customs are important for creating a sense of belonging. Moreover, biodiversity and natural landscapes are also a source of inspiration for arts, culture and, increasingly, for science.
- **Habitat:** Habitats provide everything that an individual plant or animal needs to survive: food, water and shelter. Each ecosystem provides different habitats that can be essential for a species' life cycle.
- **Income/economic revenue:** Any of the above can be seen as providing economic revenue, meaning a source of income.
- **Other:** Select if none of the above helps define how the conservation objects benefits the livelihood.
- **Note:** If necessary, provide additional details on how the conservation objects reduce climate risks.



Method>

Participatory stakeholder workshop: We recommend starting with a discussion about how the PA, through its conservation objects, is helping or could help reduce climate impacts previously identified and then how they support or could support identified response strategies using the benefits diagram exercise from the "Livelihoods" and "Combined Risks" steps.

• **Discussion on the potential of the PA through its conservation objects to reduce climate risks:**

1. Place your conservation objects on one side of the benefits diagram flipchart and place the impacts identified on the other side. Ask participants to think about and discuss how each conservation object and its sub-objects can help reduce or stop these impacts or the hazards themselves. Write the answers on sticky notes and place them on the diagram.
2. Ask participants to consider whether there are other ways in which conservation objects and sub-objects can help reduce climate risks that might not have come up in relation to the specific previously identified impacts. Remind participants to think in terms of ecosystem services or benefits that conservation objects provide for livelihoods (e.g., regulating services).
3. Revise your identified response strategies in the previous step and ask participants to identify how conservation objects and sub-objects are already supporting or could support these responses. This time, remind participants to think in terms of more direct benefits or ecosystem services (e.g., provision services). Refer to the "Livelihoods" step if needed.

- **Categorization of the risk reduction potentials:**

4. Once the diagram is finalized, ask participants to classify these risk reduction potentials into the proposed categories. Several categories can be selected for each conservation object.
5. Make sure to note which impact is reduced or which response strategy is supported by which conservation objects or its benefits. Record this in the "notes" box.

Further info>

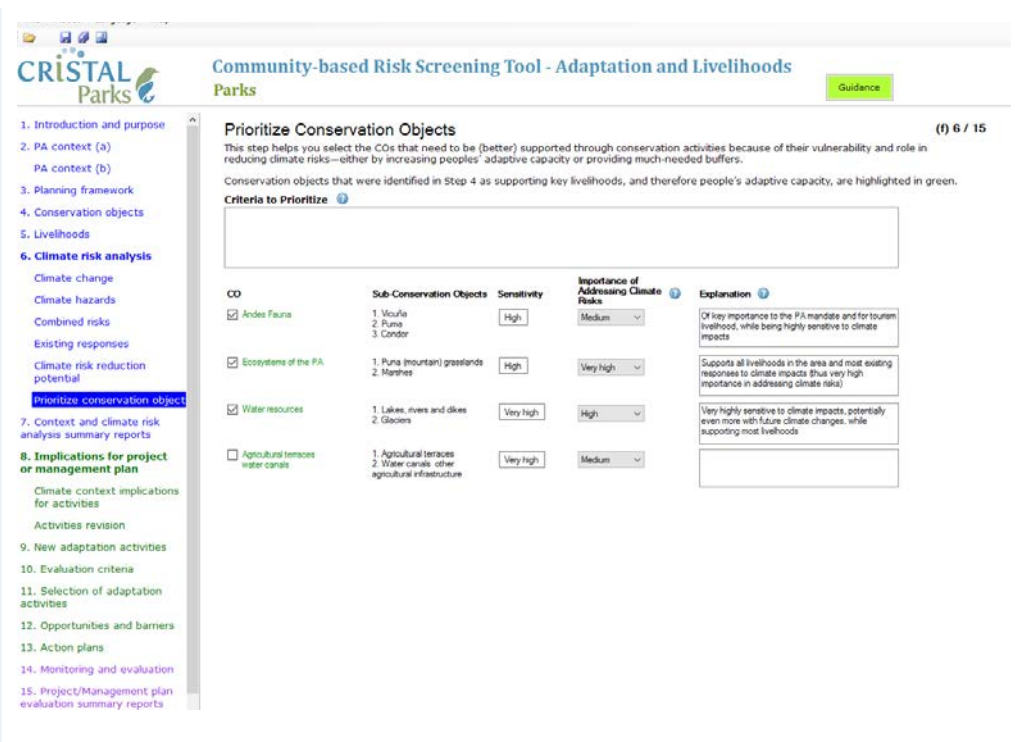
Information on how PAs can help reduce disaster risks: Consult N. Dudley, C. Buyck, N. Furuta, C. Pedrot, F. Renaud & K. Sudmeier-Rieux. (2015). *Protected Areas as Tools for Disaster Risk Reduction: A Handbook for Practitioners*. Tokyo and Gland, Switzerland: MOEJ and IUCN. Retrieved from <https://portals.iucn.org/library/efiles/documents/2015-001.pdf> ; R. Murti & C. Buyck (ed.). (2014). *Safe Havens: Protected Areas for Disaster Risk Reduction and Climate Change Adaptation*. Gland, Switzerland: IUCN. Retrieved from <https://portals.iucn.org/library/sites/library/files/documents/2014-038.pdf>

Step > Prioritize Conservation Objects

Objective > Prioritize the most climate-sensitive conservation objects and those most important for climate adaptation

Process > Review and enter information to prioritize conservation objects along three elements: i) support to adaptive capacity through benefits to livelihoods; ii) sensitivity ranking, or how vulnerable the conservation object is; and iii) its importance in addressing climate risks through risk reduction potential or support to response strategies.

- **Review information** that the tool automatically copies in this step:
 - Conservation objects: the tool automatically shows conservation objects in green font when these were identified as supporting livelihoods, thereby supporting their adaptive capacity, and in black font those that were not identified as supporting livelihoods.
 - Sensitivity: the tool automatically shows the sensitivity scores previously identified
- **Assess** the importance of conservation objects in addressing climate risks: Select a score from very high to very low to represent the degree of importance of each conservation object and its sub-objects in reducing climate risks or in supporting response strategies.
- **Prioritize conservation objects:** Click on the conservation objects in the first column that you wish to prioritize and describe why you have prioritized them in the explanation box. These will be retaken in the next steps. If you use certain criteria to prioritize conservation objects other than the current ones, you can record them in the first criteria box.



Method > Participatory stakeholder workshop: We recommend that users link the discussion on conservation objects prioritization with the results of the benefits diagram from the previous step, "Climate Risk Reduction Potential," and from how conservation object help support response strategies identified in the "Existing Responses" step.

- Start by reviewing the information recorded on your benefits diagram completed in your previous step. Ask participants to score the importance of the contribution of each specific conservation object in reducing climate risks, either through reducing the impacts or by supporting responses to these impacts. Don't forget to consider conservation objects' contributions to people's adaptive capacity through the benefits and ecosystem services they provide to livelihoods, as identified in the "Livelihoods" step. For example, if mangroves are a conservation object and they were identified as reducing climate impacts caused by hurricanes, as well as providing fishing grounds used by fishermen, increasing the adaptive capacity of fishermen, they could be scored as having a high importance in addressing climate risks overall. For example, because the marine megafauna conservation object was not identified as helping to reduce climate impacts, but is key for tourism livelihood and for maintaining ecological balance, it could be scored medium importance in addressing climate risks.
- Next, review the conservation objects' sensitivity scores from the "Combined Risks" step.
- To prioritize which conservation objects need to be absolutely supported through conservation activities, place them either in a table or create a simple graph such as the Figure 19, which places conservation objects in relation to two axes—along its importance to address climate risks and along its level of sensitivity. The selection will then depend on what you value most or what combinations of factors you value most, as well as the extent of your available resources. You may want to select conservation objects that hold the most potential to reduce risk and support most livelihoods. For example, coral reefs directly support tourism by providing scenery for divers; they indirectly support fishing by providing nurseries and contribute to reducing wave strengths, thereby reducing risks of sea surges or coastal flooding, thus having a very high importance for dealing with climate risks. Or you may want to select conservation objects that are the most sensitive to hazards in order to ensure that these will be able to function despite growing risks. For example, coral reefs are highly sensitive to increases in sea temperature and water acidity caused by climate change. You may even want to select conservation objects that are at the same time highly beneficial and highly sensitive. Alternatively, you may wish to use different criteria to select your priority conservation objects, which you can then record in the criteria box. Don't forget to describe why you have prioritized certain conservation objects over others in the explanation box.

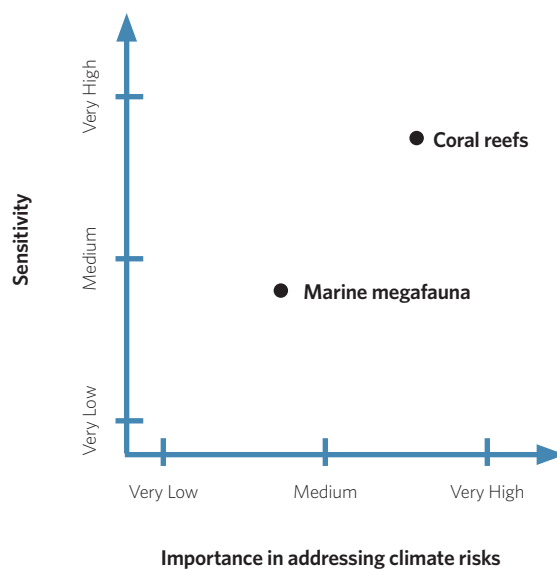


Figure 4: Example of Prioritization Process of Conservation Objects

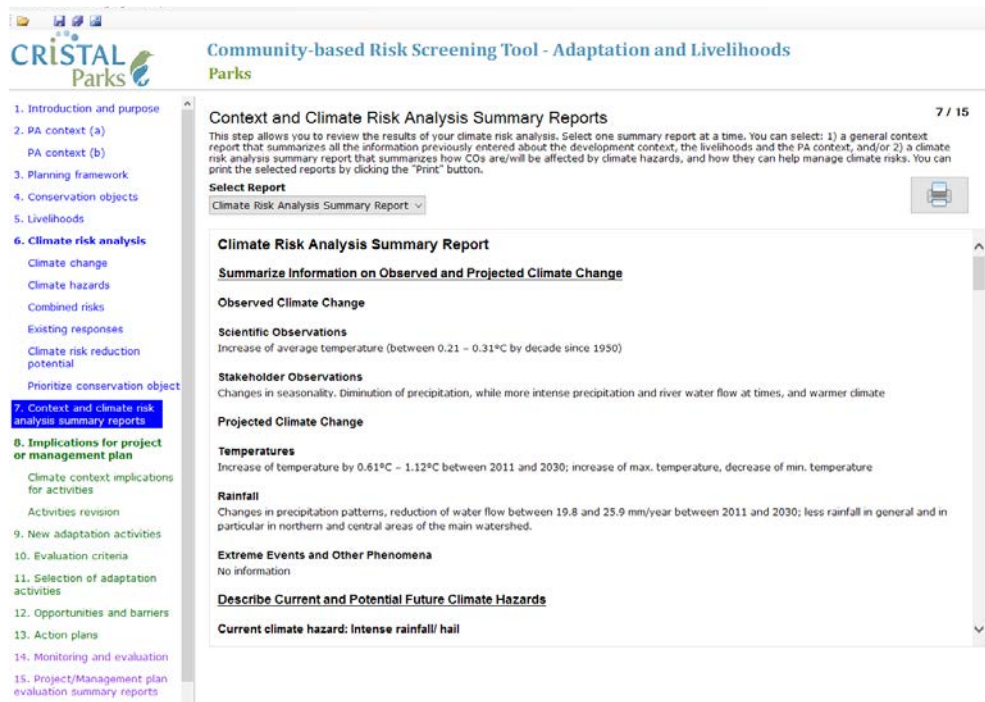
Tips >

Whichever reasons you chose to prioritize conservation objects, whether it is a function of sensitivity over capacity to help manage climate risks, vice-versa, or other, it is important to explain your choice in the last "explanation" column to ensure that your decisions are transparent.

Step > Context and Climate Risk Analysis Summary Reports

Objective > To review and analyze the results of the climate risk analysis

- Process >**
- Select one summary report after the other. You can select a **general context report** summarizing all the previously entered information about the conservation area and its surrounding contexts and a report summarizing information from the **climate risk analysis**.
 - Review the report(s) and the results and, if necessary, go back into the tool at any previous step to make adjustments so that the final report is as accurate, concise and comprehensive as possible.
 - Save and print the final report(s).
 - Analyze and discuss the results. Keep the report at hand for the following steps (if you selected any of the options on the introduction page).



- Method >**
- Planning team discussions** (either project team or PA management team) and, ideally, if time and context permit, **discussions with community members and other local partners** that participated in the participatory stakeholder workshop.
- This is an opportunity to develop a **common understanding** about the livelihoods, conservation objects and their benefits as well as the climate context within the planning team and among the planning team, potential/existing beneficiaries and local partners.

- Tips >**
- Livelihoods:**
- **Conservation object benefits or ecosystem services**
 - What is the role of conservation object benefits or ecosystem services in transmitting climate impacts from conservation objects to livelihood groups?
 - What is their role in reducing negative impacts (through their importance for response strategies and for reducing certain climate impacts)?

- **Climate change**

- How might climate hazards, and therefore climate impacts, change with future climate change, and what does it mean for the sustainability of response strategies?

- **Impact chains**

- Which conservation objects are affected by climate hazards? Which livelihoods are affected as a result? How and why?
- How might non-climate hazards interact with climate hazards to create additional stresses?

Response strategies:

- How well are the communities and other local stakeholders able to respond to impacts (analyze the information entered under “sustainability”)? Are some social groups better able to respond to the impacts? Why and how?
- What is already working well (i.e., which impacts do communities feel they can handle well)? What needs improvement?

Box 3: What's next?

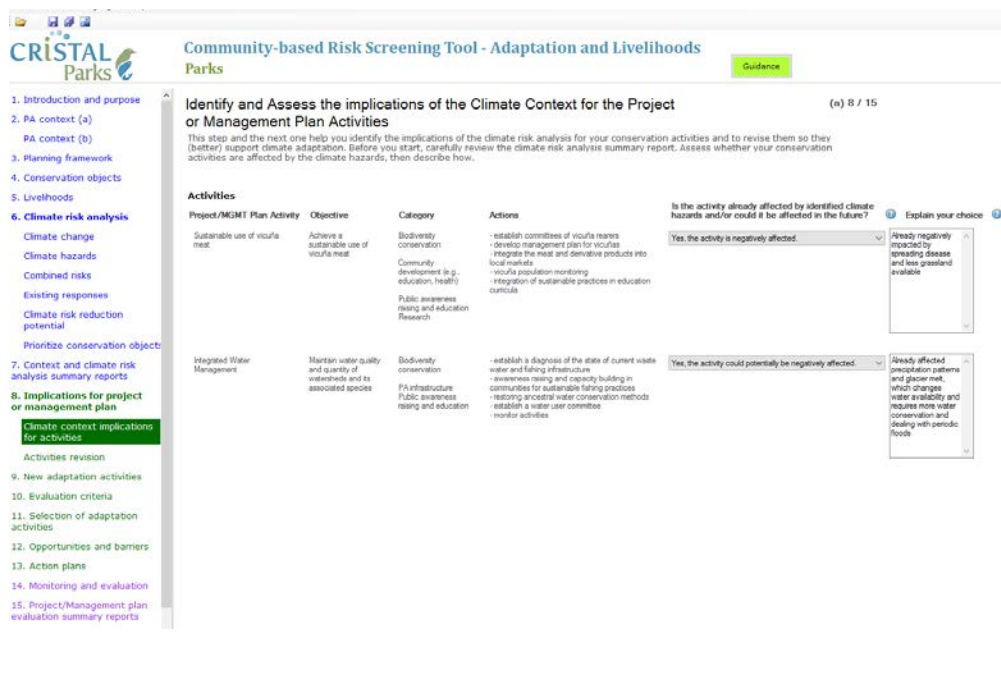
On the introductory page of this tool, if you have chosen to:

- Only understand how the conservation objects, the livelihoods and climate context interact, then you have now completed the necessary steps.
- Revise existing project or PA management plan activities, then you can continue with next step “Implications for Project or Management Plan” ([page 43](#))
- Design new project or management plan adaptation activities (without revising existing activities). Then you can go to “Identify New Adaptation Activities” ([page 46](#))

Step > Identify and Assess the Implications of the Climate Context for the Project or Management Plan Activities

Objective > To assess the implications of the climate risk analysis for your planned project or management plan activities

- Process >**
- Assess** whether the planned activities are already affected by the identified climate hazards and/or could be affected in the future and select one of these answers in the tool:
 - Yes, the activity is negatively affected: The activity is currently negatively affected (i.e., it won't be successfully implemented or achieve its objectives).
 - Yes, the activity could potentially be negatively affected: You foresee that your activity could negatively be affected in the future, considering climate projections and potential hazards identified.
 - No, the activity is not negatively affected and is not foreseen to be affected: The activity is neither positively nor negatively affected by the climate context. Its implementation is undisturbed by it.
 - The activity is or could potentially be positively affected: You already observe or foresee positive impacts from the climate context for your activity implementation (i.e., the implementation is facilitated).
 - The activity helps to manage climate risks: Your activity is not only not negatively affected but already contributes to reducing climate risks that could have compromised your activity in the first place. This is more relevant if your activities are already adaptation measures.
 - Explain your choice** in the box.



- Method >**
- Planning team discussions** (either project or PA management team), ideally, if time and context permit, with **inputs from participants to the participatory stakeholder workshop**.
 - This step builds upon the results of the previous steps. Before getting started, review the climate risk analysis summary reports thoroughly to ensure you build on those results.

Tips > The tool automatically copies your planned activities, their objectives and the necessary actions to implement them as identified in the "Planning Framework" step to help assess the climate context implications on them.

Step > Revise Project or Management Plan for Existing Activities

Objective > To revise planned activities to support climate adaptation

Process >

- Once existing project or PA management plan activities are entered and priority conservation objects in the focus area are identified in the previous steps, they will automatically appear on this page (on vertical and horizontal axes).
 - Activities that were identified as already being negatively affected by climate risks will automatically appear in red font.
 - Activities that were identified as potentially being negatively affected in the future will automatically appear in orange font.
 - Activities that were identified as not being affected in any way will automatically appear in black font.
 - Activities that were identified as already being or potentially being positively affected will automatically appear in green font.
 - Activities that were identified as already helping to manage climate risks will automatically appear in green font.
- **1. Score the impact** of each existing activity on the conservation objects you identified as vulnerable to climate hazard and/or as important for the response strategies with any number between -2 (very negative impact) and +2 (very positive), using the dropdown function beside each priority conservation object.
- **2. Explain the positive and/or negative impacts** of each existing activity on the conservation objects important for climate adaptation.
- **3. Devise revised project or management plan activities** that minimize any negative impacts and maximize positive ones, while taking into account whether they are already negatively affected by the climate context or in the contrary are positively affected by it looking at the activities' font colours in the tool.
- If you are using the tool to revise existing activities of a PA management plan, we recommend you to also revise PA management zones previously identified in the "PA context" steps if needed (i.e., if the climate context negatively impacts actual management zones). Existing management zones will automatically appear under revised activities. If you are using the tool for a project, then you don't need to revise management zones.

The screenshot shows the 'Revise Project or Management Plan Existing Activities' step in the CRiSTAL Parks tool. The interface includes a navigation menu on the left with 15 steps, where step 8 is highlighted. The main content area is titled 'Revise Project or Management Plan Existing Activities' and includes a 'Guidance' button. Below the title, there is a table with columns for 'Activity 1' (Sustainable use of vicuña meat) and 'Activity 2' (Integrated Water Management). The table lists 'PRIORITIZED COs' (Andes Fauna, Ecosystems of the PA, Water resources) and 'REVISED ACTIVITIES'. Each activity has a dropdown menu for scoring the impact on each CO. For example, for 'Andes Fauna', Activity 1 has a score of 2 and Activity 2 has a score of 1. The 'REVISED ACTIVITIES' section shows the updated activity description: 'Sustainable use of vicuña to be more proactively linked to other activities of integrated water management to ensure water'.

Method >

- **Planning team discussions** (either project or PA management team), ideally, if time and context permit, with **inputs from participants to the participatory stakeholder workshop**.
- This step builds upon the results of the previous step and the climate risk analysis. Before getting started, review the climate risk analysis summary reports thoroughly to ensure you build on those results.

Tips >

Using the climate risk summary reports, here are a few elements you should pay particular attention to when reading through the climate risk analysis summaries:

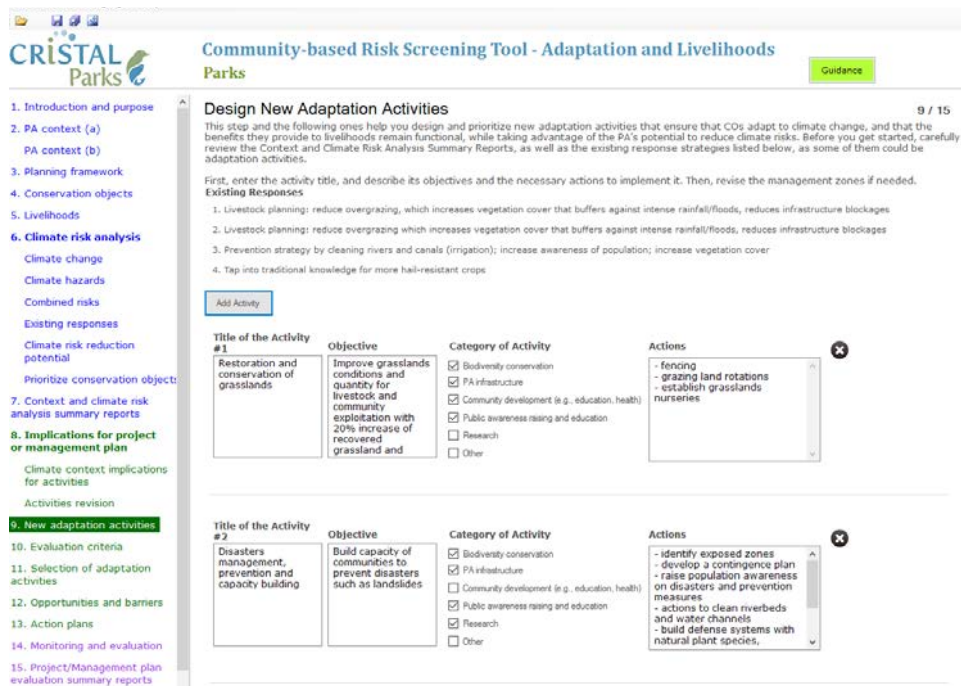
- **Conservation object benefits:** Consider to what extent the project or management plan activities affect, or are affected by, who has access to and control over conservation objects and the benefits or ecosystem services they provide. Those who control the conservation objects will influence the success in implementing the activities. Adaptive capacity is strengthened if vulnerable groups have more access and control over these.
 - **Climate change:** Consider to what extent the project or management plan activities account for the positive and/or negative impacts of future potential climatic change.
 - **Climate impact chains:** Consider whether the user's activities contribute to reducing (positive impact) or increasing (negative impact) specific vulnerabilities (e.g., if a hurricane destroys trees that help regulate water and avoid floods, is the project providing alternative flood-protection measures or is it, on the contrary, helping move key crops into vulnerable areas?).
 - **Responses:** Look at the ways in which conservation object benefits and ecosystem services are used in response strategies, and consider whether the activities are supporting these functions or not. Use response strategies identified as sustainable as examples to revise your current project or management plan activities.
 - **Livelihood groups:** Identify which groups need particular attention in the activities and what potential conflicts within communities and other local stakeholders you should take into account.
 - **Existing activities:** When reviewing the report, pay attention to the activities objectives and specific actions required to undertake them, as it is more likely that you will need to revise specific actions than overall activities.
-

Step > Design New Adaptation Activities

Objective > To propose new adaptation activities

Process >

- Once existing response strategies to climate impacts are identified and entered in previous steps, the ones selected as sustainable or alternative responses will automatically appear on this page as these can be used as a starting point for new activities.
- **Click the "Add Activity" button.** You will then be asked to enter the title of a new activity that supports climate adaptation in the focus area and to describe this activity. **Describe the activity** by entering information on:
 - Its objective(s)
 - Type of activity, by selecting corresponding categories (e.g., activities can aim to raise public awareness of the value of the conservation area or target specific species, infrastructure or aim to contribute to community development). You can select several categories for each activity or type your own category under "other."
 - Specific activity's actions to implement it.
- **Revise PA management zones:** If you are using the tool to revise existing activities of a PA management plan, we recommend you also revise PA management zones previously identified in the "PA context" steps if needed (i.e., if the climate context negatively impacts actual management zones). Existing management zones will automatically appear under your added activities. If you are using the tool for a project, then you don't need to revise management zones.



Method >

- **Planning team discussions**, ideally if time and context permit, with **inputs from participants to the participatory stakeholder workshop**, based on the results of the climate risk analysis summaries.
- Literature review on climate adaptation strategies relevant to the project or management plan context.

Tips >

Build upon a climate risk analysis: Here are a few elements you should pay particular attention to when reading through climate risk analysis summaries:

- **Livelihood groups:** The climate risk analysis identified the vulnerabilities and response strategies of different livelihood groups or of social actors involved. When proposing new activities, be sure to target particularly vulnerable groups or individuals and also make sure that new activities targeting one group are not detrimental to any other groups in the communities.
- **Conservation objects:** New climate risk management measures should target:
 - The conservation objects identified as climate sensitive (i.e., that are affected by climate hazards) and find ways of reducing their sensitivity to current and potential future hazards.
 - The conservation objects important for sustainable response strategies and those that support livelihoods through their benefits or ecosystem services. Activities that strengthen these tend to bolster the adaptive capacity of communities and local stakeholders. At a minimum, new activities shouldn't compromise these conservation object benefits.
 - People's access to, and control over, conservation objects (and the benefits or ecosystem services they provide) that are important for responding to climate impacts: when designing new activities, consider how they affect access and control. Adaptive capacity is strengthened if vulnerable groups have more access to and control over these.
- **Climate change:** Think of how the new activities will work or not under a changing climate in the short and long terms. Climate change may make currently minor risks more important or lead to new ones. Make sure new activities account for the broader socioeconomic, political and ecological context that may increase people's vulnerability to climate hazard.
- **Responses:** Build upon solutions identified by local actors themselves instead of proposing new solutions. The local stakeholders have already identified current strategies that are considered sustainable, as well as alternative ones. These are examples of what works or what could work, and therefore provide an excellent starting point for any additional climate risk management activities. The tool automatically copies these responses in this step.

Explore a wide range of response strategies

Different social groups can respond to climate hazards in many different ways, including by doing nothing or by decreasing, transferring or avoiding the negative impacts of climate risks on their livelihoods. Table 5 classifies response strategies into seven different categories. This table is a useful tool to help you analyze the different types of responses documented through the consultations and explore how the project or management plan can strengthen and even diversify those response strategies (i.e., if one strategy does not work, people can still rely on other response strategies). Similarly some strategies may be more effective for certain groups in a community than others and you can investigate why and how to take this into account in the new activities. Not all response strategies are sustainable and some should be avoided (e.g., the activities should help communities to move away from "bearing losses").

Table 5: Seven Categories of Response Strategies

| Response category | Definition | Note/example |
|-------------------------|--|--|
| Bear losses | Do nothing, absorb losses | No capacity to respond; responding costs too much |
| Share losses | Spread the burden of losses across different systems or populations | Extended families, publicly funded reconstruction, insurance |
| Change location | Move the activity or system | Relocating major crops to new areas; migration |
| Prevent losses | Continue activity, but in a modified manner to prevent effects of climate risk | Structural (reservoirs), on-site operations (crop management), institutional (land-use planning) |
| Change use | Stop and substitute economic activities not sustainable under climate change | Change crops, turn farmland into conservation area |
| Build adaptive capacity | Enhance resilience of system to improve ability to deal with stress | Research, raise awareness, change standards/policy |
| Modify the threat | Exercise a degree of control over the environmental threat | Climate change mitigation, specific hazard—e.g., flood control |

Source: adapted from Burton (1996)

Further info >

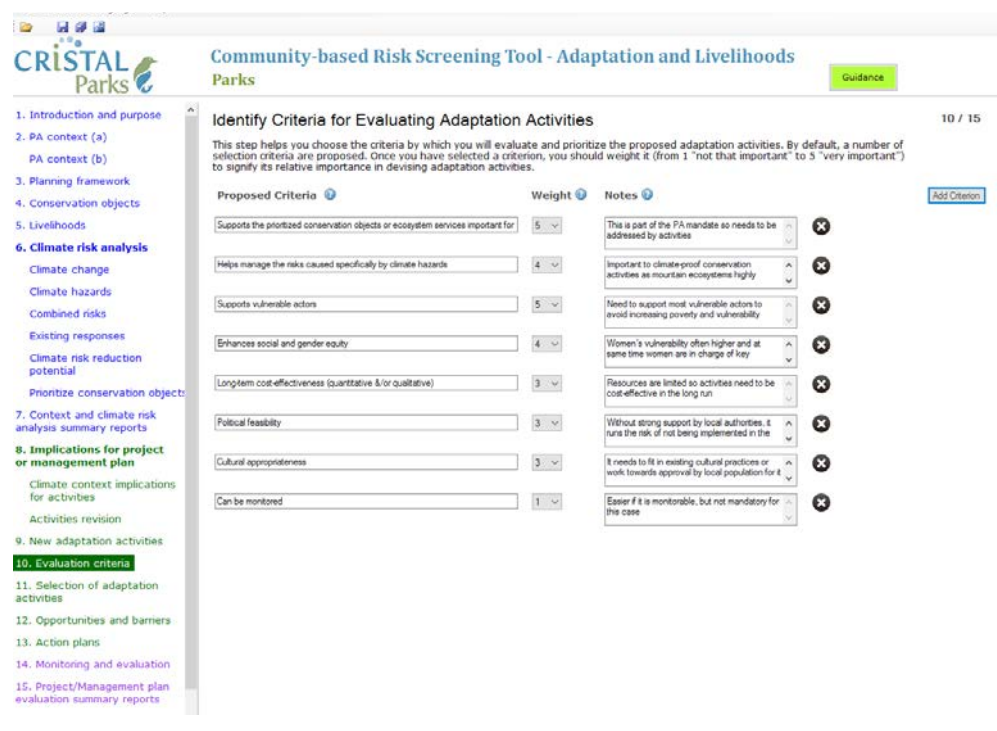
For information on climate risk management in general, please consult the following:

- The **Adaptation Learning Mechanism (ALM)** is a global knowledge-sharing platform that hosts a database of adaptation practices, policy and planning tools, and capacity-building resources. (www.adaptationlearning.net)
 - **weAdapt** is a knowledge platform that links to a range of case studies and articles on practical adaptation solutions. (www.weadapt.org)
 - The **Climate Adaptation Knowledge Exchange (CAKE)** is a knowledge base for managing natural systems in the face of rapid climate change. It offers, among other things, a wide range of case studies with practical adaptation solutions. (www.cakex.org)
 - The **Adaptation Partnership** offers a review of worldwide adaptation action that can inspire individual or community action plans. (<https://sites.google.com/a/ccrdproject.com/adaptation-partnership2/activities>)
 - For information on ecosystem-based adaptation, please consult the **IUCN website on EbA**, https://www.iucn.org/about/work/programmes/ecosystem_management/climate_change/eba/
-

Step > Identify Criteria for Evaluating Adaptation Activities

Objective > To identify evaluation criteria for the selection of the new adaptation activities.

- Process >**
- **Choose the criteria** by which proposed climate adaptation activities will be evaluated and prioritized. By default, a number of selection criteria are proposed (see below). You can add criteria by clicking on “Add Criteria” and remove criteria by clicking on the X-buttons.
 - **Weight the criteria** to signify their relative importance in devising adaptation strategies. Use the scrolling button to select a ranking from 1 (not that important) to 5 (very important).
 - Optional: A note box is available to allow you to **describe why** you chose a given criterion and weight and how you define your criterion if needed.



Method > Planning team discussions, ideally, if time and context permit, with **inputs from participants to the participatory stakeholder workshop**

- Tips >**
- By default, 10 equally weighted criteria for evaluating adaptation activities are proposed:
- **Supports the prioritized conservation objects and their benefits or ecosystem services important for adaptation:** Normally, the proposed strategies should already support the prioritized conservation objects or the ecosystem services they provide, as these play a role in adaptation. Nevertheless, the user may decide that this might not be the most important task and reflect this in the weighting, or conversely, might think that this is the most important task and adjust the weighting accordingly.

- **Helps manage the risks caused specifically by climate hazards:** The proposed strategies should already take into account the impacts of climate change. Nevertheless, practical actions often focus on the more short-term risks or could even focus on addressing only non-climate risks. This criterion intends to make sure that the projected climatic changes summarized in your analysis are explicitly taken into account. However, the user may also decide that addressing more immediate hazards is more important, and this can be reflected in the weighting.
 - **Supports vulnerable actors:** The most vulnerable socioeconomic actors have the greatest need to increase their adaptive capacity; therefore, activities that target vulnerable actors should be preferred over those that share their benefits indiscriminately across the population. You can identify which social groups tend to be more socially disadvantaged/marginalized, and therefore who could be more vulnerable, by referring to the contextual steps such as the steps compiling information about the PA and its development context.
 - **Supports a large number of beneficiaries:** This simple criterion counts how many people are likely to benefit from an intervention. More widely shared benefits should be preferred.
 - **Enhances social and gender equity:** Proposed strategies should, at the minimum, not worsen gender inequalities and other social forms of discrimination and marginalization. Here, the criterion helps the user to think whether and how the strategy can increase social and gender equity, as climate impacts are often gender differentiated.
 - **Long-term cost-effectiveness (quantitative and/or qualitative):** Less costly solutions should be preferred for obvious reasons; however, cost effectiveness should be considered over the long term, as adaptation solutions will, by their very nature, often only pay off in the longer run. Looking at costs, therefore, needs to take into account not only the immediate implementation costs of the project, but also the avoided future costs of climate impacts and the benefits that might not be monetized.
 - **Political feasibility:** Running into strong political resistance with certain activities may even undermine other less contentious activities. Nevertheless, to induce a proper transition towards sustainable development will often have to involve a certain amount of political opposition. This criterion should therefore not be used to rule out innovative thinking. Moreover, the later step of "Opportunities and Obstacles" allows users to think deeper about potential obstacles to implementation, while this criterion helps to discard already known unfeasible ones.
 - **Cultural appropriateness:** Changes induced by new strategies also need to respect the local culture to be feasible; otherwise, you may find that changes are not widely adopted. As in the previous criterion, this should not rule out all kinds of substantial changes, as deeply rooted behaviour may often be part of the problem.
 - **Can be monitored:** It is preferably that a strategy and its specific actions can be monitored through indicators. Ultimately, the user might have to show progress and be accountable for resources invested, which is facilitated if a strategy can be monitored.
 - **Is part of the PA mandate:** Many of the proposed strategies will likely hold various benefits and help adapt to climate change; however, not all will fall under the mandate of the PA. Note that this criterion only applies if you are using this tool for integrating climate risks in a PA management plan.
-

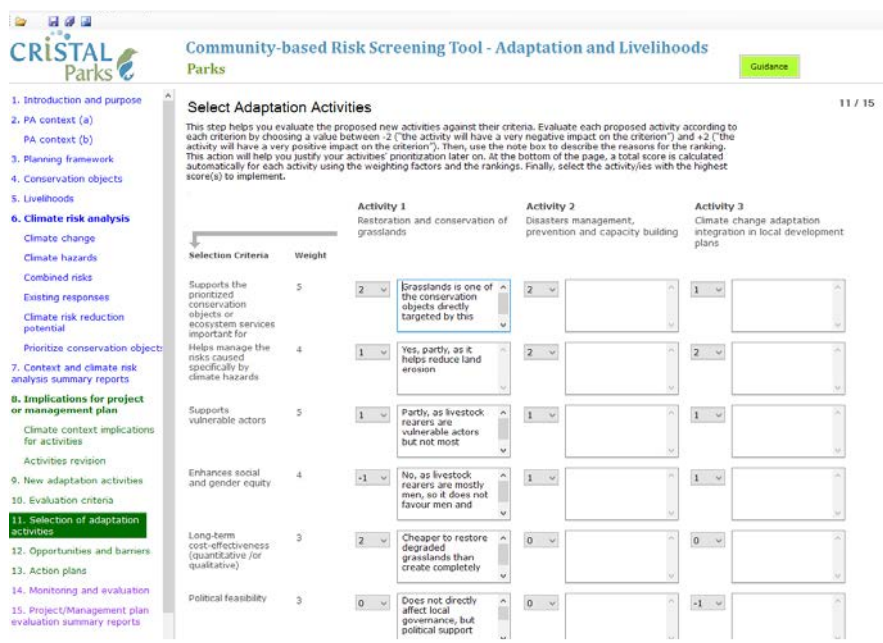
Step > Select Adaptation Activities

Objective > To evaluate and prioritize the new adaptation activities

Process > This step allows you to evaluate the proposed new activities against their criteria. The proposed new adaptation activities and the criteria from the previous steps will automatically appear on the horizontal and vertical axes.

- **Evaluate** the contribution of each proposed activity to each selection criterion by choosing any value between -2 (the activity will have a very negative impact on the criterion) and +2 (very positive impact).
- A note box is available to allow you to describe the reasons for the ranking. This will help you **justify your prioritization** of activities later on.

At the bottom of the page, a **total score** is calculated automatically using the weighting factors and the rankings. The total score can inform the types of activities selected for implementation (i.e., the higher the score, the better the activity). You can click on the "Select" button to choose the activities you want to implement.



Method >

- **Planning team discussions**, ideally if time and context permit, with **inputs from participants to the participatory stakeholder workshop**.
- At the end of the page, you will see the total score for each activity, which is calculated by multiplying the provided ranking with the weight of the respective criteria.

Tips > When ranking the activities according to each criterion, be sure to carefully consider the exact meaning of each criterion. If necessary, go back to the previous step and look at any notes provided to describe the criterion. The revised project or management plan activities are not evaluated in this step because it is assumed that it has already been decided that these activities will be implemented. The CRISTAL Parks analysis will only contribute towards adjusting them incrementally rather than deciding whether they should be implemented or not.

Table 6: An Example of How the Total Score is Calculated

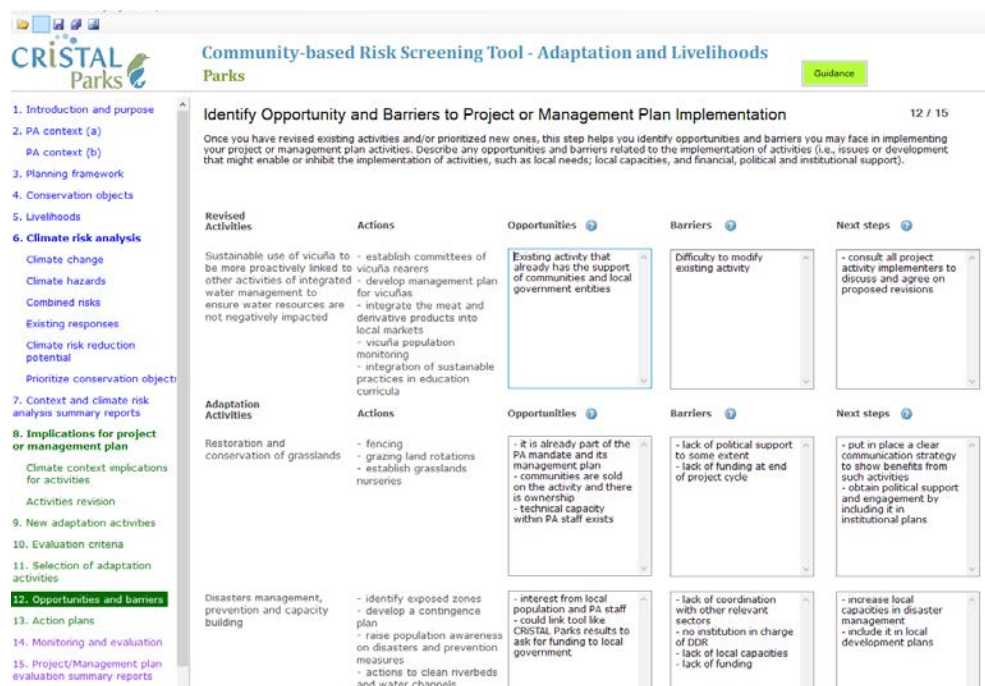
| Example | Weight | Activity ranking | Score for criterion (multiplication of weight and ranking) |
|-------------|--------|------------------|--|
| Criterion 1 | 3 | 2 | 6 |
| Criterion 2 | 1 | 0 | 0 |
| Criterion 3 | 2 | -1 | -2 |
| Total score | | | 4 |

Step > Identify Opportunities and Barriers to Project or Management Plan Implementation

Objective > To identify opportunities and barriers to the implementation of the project or management plan activities

Process > Once you have entered revised and/or new activities in the previous steps, they will automatically appear on the left-hand side of this page (horizontal axis). You are then asked to identify the following:

- **Opportunities:** List any factors that will facilitate the implementation of each activity (e.g., strong local support, synergies with other projects, funding prospects, political will, presence of local material, etc.).
- **Barriers:** List any factors that may provide obstacles to the implementation of each activity (e.g., skepticism of the local population, duplication with other initiatives, lack of funding, political opposition, etc.).
- **Next steps:** Describe how to proceed to successful implementation and results by taking advantage of the identified opportunities and by reducing or avoiding the barriers (e.g., further consultations with locals if there is skepticism, consultation with other project teams to exploit synergies and avoid duplication, moving ahead quickly to exploit a funding opportunity, engaging political leaders).



Method > Planning team discussions are completed in some cases with additional interviews and inputs from stakeholder workshop participants to identify key issues.

Tips > Filling in the boxes is optional, but going through the three steps for each activity could help you avoid pitfalls and build on synergies when implementing the activities.

Step > Identify Action Plans to Implement Adaptation Activities

Objective > To elaborate action plans for each of your new adaptation activities to facilitate implementation

- Process >** This is an optional step. To prepare an action plan for each of your newly designed activities, enter information on:
- **Existing operational plan:** Describe the structure of your existing operational plan. If you have one, we recommend you to follow your existing plan and do not need to continue filling this step.
 - Adaptation activities and specific actions will automatically appear on the left hand side of this step. For each activity describe:
 - **Needed resources:** enter all resources you need to implement the activity (e.g., human resources such as workers to set up mangrove nurseries or material such as the seeds and a small boat).
 - **Budget:** estimate the monetary cost of implementing the activity from start to finish (e.g., USD 40,000).
 - **Implementation timeline:** enter the complete duration of the activity's implementation (e.g., one year).
 - **Responsible agencies:** Identify all actors that need to be involved to successfully implement the activity. These can be community members, government entities, private sector, NGOs, etc. (e.g., local mayor, community members hired to plant mangroves through existing cooperatives, fishermen, tourist guides and touristic infrastructure representatives, etc.). If possible, identify specific focal persons in each agency.
 - **Reviewing timeline:** Determine a date for when the activity needs to be reviewed in terms of its effectiveness and allow for adjustments if needed. This will often depend on total duration of your activity (e.g., six months after the activity started for a one year long activity).

| Adaptation Activities | Actions | Needed Resources | Budget | Implementation Timeline | Responsible Agencies | Reviewing Timeline |
|--|---|--|--|--|--|---|
| Restoration and conservation of grasslands | - fencing - grazing land rotations - establish grasslands nurseries | Need: technical capacity in communities to build nurseries and implement land rotations; at least 3 persons planting | \$3,000 (in addition to existing budget for related ongoing activity targeting vicinias) | 1st phase: 2 years 2nd phase (ensure grasslands are durably restored among other things): 5 years | Livestock rearing association - Mr. Hernandez Protected area agency (Mr. Dixon) | Every six months for 1st phase and then every 1.5 years for 2nd phase |
| Disasters management: prevention and capacity building | - identify exposed zones - develop a contingency plan - raise population awareness on disasters and prevention measures | Local climate model to share exposure map; seed plants for erosion reduction; 1 person to build capacity of | \$20,000 | 4 years | DRR and climate change national focal points Protected area agency (Mr. Clark) Mayor's office (all villages) | Every year |

Method >

- **Planning team discussions**, reviewing project or management plan documents.
- This step is optional. If you already have a specific way to design your action or operational plans, it is recommended you follow your own planning tool in order to facilitate the uptake of the CRISTAL Parks tool results. Otherwise, fill in the information in this step.

Tips >

- We recommend you to **pay particular attention to the specific actions needed to implement each activity**, as the needed resources and the other necessary information to elaborate action plans will mostly relate to the actions.
 - **Be as specific as possible** in your answers, as these will serve as your initial activity planning document or even your project plan.
-

Step > Identify Key Elements and Indicators for your Monitoring and Evaluation Framework

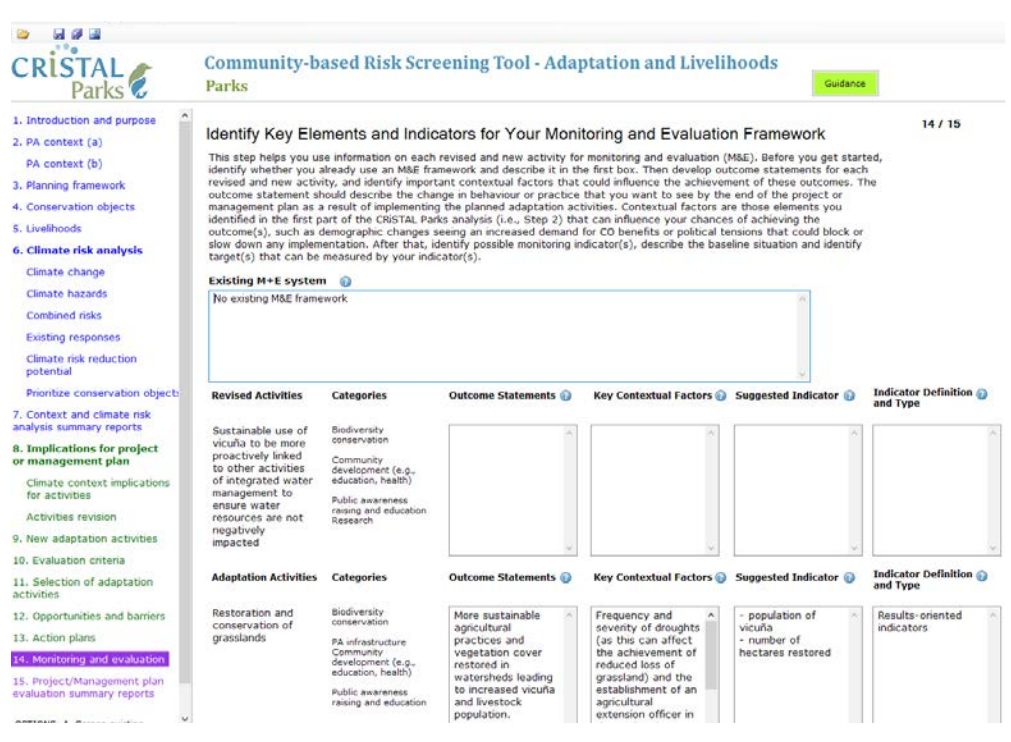
Objective > To summarize relevant information for each revised/new activity to support an existing or newly developed M&E framework

Process > Identify whether you have an existing M&E system and if yes, describe it.

For each revised/new activity, identify:

- **An outcome statement:** the changes in behaviour or practice that you want to see by the end of the project or management plan as a result of implementing the adaptation activity. This change in behaviour or practice may, for instance, increase the capacity of women and men to minimize the influence of climate risks on their livelihood activities. Make sure to identify concrete and measurable outcomes.
 - Example: "Reduced loss of grasslands for llama and livestock grazing seeing increased llama population due to droughts as a result of more sustainable agricultural practices and vegetation cover restoration in watersheds."
- **Key contextual factors:** important factors (climatic and non-climatic) that can influence the chance of achieving the expected outcome. Please refer to the context in the climate risk analysis summaries.
 - Example: "Frequency and severity of droughts, the establishment of an agricultural extension officer in the region that can provide advice and seeds for more sustainable agricultural practices."
- **Indicators:** identify indicators to monitor the progress of the activities' implementation.
 - Suggested indicator: identify one or more indicators for each activity (e.g., number of llama individuals).
 - Indicator definition and type: describe what the indicator is supposed to capture and whether it is a results-oriented, process or context-based indicator (e.g., number of llama individuals' indicator is meant to capture the population size if llamas in the area, and it is a results- or outcome-based indicator).
- **Baseline:** describe the baseline situation (e.g., currently, there are 70 llamas).
- **Target:** set a specific target or goal that can be measured by your indicator (e.g., increasing llama population by 20 per cent in three years to reach 84 individuals, thereby exceeding minimum level for a healthy population).

Integrate the indicators in the existing M&E system: Describe how you will integrate these indicators into your existing project or management plan M&E system if you have one in place.



Method > **Planning team discussions**, ideally, if time and context permit, with the involvement of participatory stakeholder workshop participants to reflect their priorities.

- Tips >**
- The current context of high uncertainties due to climatic and non-climatic factors requires that you put learning and M&E at the centre of the project cycle. Monitoring is about tracking the progress of a project in terms of activities, inputs, outputs, targets, outcomes and context over time. Evaluation uses monitored information to assess whether and why stated goals are being achieved or not. M&E requirements need to be taken into account right at the design stage of any project.
 - **While CRiSTAL Parks is not an M&E tool, much of the information gathered through its application can be integrated into an existing or newly developed M&E framework.** This is why this step first asks you to check whether your organization already uses a specific M&E scheme. If it does, it is recommended you review it first and then consider what parts of this step you need to complete to ensure harmonization and integration with the existing scheme. This is especially relevant when thinking about designing new indicators, as some of the existing ones might already be useful and reviewing them will also ensure that indicators can be easily and feasibly integrated in the existing scheme.
 - **Make sure that you develop “SMART” indicators**, which stands for: “Specific, Measurable, Attainable, Relevant and Time-bound.”
 - Ideally, the planning team (project or PA team) should consult the relevant local stakeholders after a specific time period and ask them to assess to what extent the expected outcomes have been achieved; they should also use the monitoring indicators.
 - **The planning team should gather periodic information on the key contextual factors** to understand how these factors have influenced the realization of the expected outcomes over a specific time period.
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- Further info >**
- *Making Adaptation Count: Concepts and Options for Monitoring and Evaluation of Climate Change Adaptation* provides a six-step process for developing an M&E system for adaptation. (<http://www.wri.org/publication/making-adaptation-count>)
 - *UKCIP AdaptME Toolkit* offers practical support in evaluating adaptation progress and performance. (www.ukcip.org.uk/adaptme-toolkit)
 - Monitoring and Evaluating Adaptation page by the Governance and Social Development Resource Center summarizes some of the key challenges in M&E adaptation activities, and links to a range of further resources. (www.gsdr.org/go/topic-guides/climate-change-adaptation/monitoring-and-evaluating-adaptation)
 - CARE's *Participatory Monitoring, Evaluation, Reflection and Learning for Community-based Adaptation (PMERL) Manual* provides a participatory approach to measure changes in adaptive capacity and supports adaptive management of local adaptation strategies during and beyond a given intervention. (http://www.careclimatechange.org/files/adaptation/CARE_PMERL_Manual_2012.pdf)
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Step > Project/Management Plan Evaluation Summary Reports

Objective > To review the results of the tool application

Process > Select one summary report after the other. You can choose to select between two different reports:

- Revision of existing activities report
- Design of new adaptation activities report

These reports can be selected and printed as the risk analysis summary reports. They should help you implement activities.

CRISTAL Parks Community-based Risk Screening Tool - Adaptation and Livelihoods Parks

2. PA context (a)
PA context (b)
3. Planning framework
4. Conservation objects
5. Livelihoods
6. **Climate risk analysis**
Climate change
Climate hazards
Combined risks
Existing responses
Climate risk reduction potential
Prioritize conservation object
7. Context and climate risk analysis summary reports
8. **Implications for project or management plan**
Climate context implications for activities
Activities revision
9. New adaptation activities
10. Evaluation criteria
11. Selection of adaptation activities
12. Opportunities and barriers
13. Action plans
14. Monitoring and evaluation
15. **Project/Management plan evaluation summary reports**

Project / Management Plan Evaluation Summary Reports 15 / 15

This step helps you review and analyze the results of your project or management plan evaluation (i.e., revisions of existing activities and/or design of new adaptation activities). Select one summary report after the other from the drop-down menu. You can print the selected reports by clicking the "Print" button.

Select Report
Design of New Adaptation Activities Report

Design of New Adaptation Activities Report

Design New Adaptation Activities

| Title of the Activity | Category of Activity | Objective | Actions |
|--|---|--|---|
| Restoration and conservation of grasslands | Biodiversity conservation PA infrastructure Community development (e.g., education, health) Public awareness raising and education | Improve grasslands conditions and quantity for livestock and community exploitation with 20% increase of recovered grassland and reduce land erosion | - fencing - grazing land rotations - establish grasslands nurseries |
| Disasters management, prevention and capacity building | Biodiversity conservation PA infrastructure Public awareness raising and education Research | Build capacity of communities to prevent disasters such as landslides | - identify exposed zones - develop a contingency plan - raise population awareness on disasters and prevention measures - actions to clean riverbeds and water channels - build defense systems with natural plant species, especially in high-gradient zones to reduce erosion and buffer - build institutional capacity of local government entities |



Additional Useful Information

Photo: Participants in a CRISTAL Parks application in Mexico. It is highly recommended that new users acquire training to benefit the most from the tool.

So, Why Use CRiSTAL Parks?

While much guidance on integrating climate adaptation in conservation is now available, most of it focuses on specific species, ecological processes or ecosystems without taking into account human communities living inside or around conservation zones. Although it is critical to understand and address biological vulnerability, it is also necessary to address social vulnerability and, in particular, how adaptive capacities and vulnerabilities can be enhanced or decreased through the interaction of people and conservation areas. Conservation has already undergone a paradigm shift from conservation in isolation of humans to a concept that tries to reconcile conservation with development needs, but guidance on how to ensure conservation is applied in a way that takes into account climate risks is only slowly catching up with current conservation thinking. CRiSTAL Parks aims to provide its users with a practical tool that considers at its core the linkages between people and PAs, and builds on this to ensure conservation activities are compatible in the face of a changing climate, and help increase people's adaptive capacity to climate change and variability.

CRiSTAL Parks provides at least four key attributes and comparative advantages:

- **Simplicity and practicality:** CRiSTAL Parks provides a systematic, simple and flexible framework for understanding and analyzing the links between climate risks, vulnerabilities and adaptive capacities, livelihoods, PAs through conservation objects and conservation projects or PA management plans. The steps of the CRiSTAL Parks analysis are explicitly and logically linked. The tool helps users summarize, consolidate and organize the information collected during the participatory stakeholder workshop in a very logical manner. The summary reports further facilitate the data analysis process. The CRiSTAL Parks process requires between two and five days and can lead to incremental changes in conservation projects or PA management plan design and management (versus transformational change).
- **Livelihoods, conservation objects and climate-risk focused:** CRiSTAL Parks does not treat climate risks solely as an environmental problem, but links them to the lives and development prospects of the concerned communities and other relevant actors influencing and being influenced by the PA through its approach centred on conservation object benefits/ ecosystem services and livelihoods. The emphasis on livelihoods and conservation object benefits also allows the user to focus on opportunities and capacities (i.e., what people have and do, building on the potential of PAs to reduce their vulnerabilities and that of conservation objects) rather than just constraints (i.e., what they lack). CRiSTAL Parks focuses on both climate variability and climate change. Current vulnerabilities and risks, as indicated by the PA or conservation zone stakeholders, are the point of departure of the analysis; however, long-term climate projections are also taken into account.
- **Participatory:** CRiSTAL Parks explicitly and systematically relies on communities' and local experts' knowledge and experience, and applies participative methodologies to collect the relevant information. This approach helps to ground the analysis in the local realities and empower communities and local actors to identify climate adaptation interventions that are in tune with local men's and women's needs, priorities and conditions.
- **Versatility:** CRiSTAL Parks can be used at different scales (from a section of a PA or a conservation zone, to a complete PA and its influence zone, to a regional network of PA, to national-level conservation interventions) and for different purposes (i.e., to screen natural resource management projects, PA management plan activities, conservation policies, proposed adaptation activities or to support parts of a comprehensive climate risk assessment). It is designed to be compatible with project and PA management frameworks.

Where and How is More Information Available?

A range of resources is available on the **CRiSTAL website**, www.cristaltool.org, including:

- Downloads of the tool and this User's Manual.
- **CRiSTAL Stories briefs**, documenting best practices associated with the application of CRiSTAL.
- **Examples of past CRiSTAL and CRiSTAL Parks applications** around the world, including a database of users' reports. These reports can allow users to identify the "CRiSTAL champions" in the user's country or region.
- **An events calendar** showing upcoming training sessions and other activities.

CRiSTAL Parks training workshops are conducted periodically in different regions around the world. Previous experiences with using CRiSTAL have demonstrated that, for new users, it is important to attend a training session. The training workshops often provide participants with an introduction to some of the basic concepts and approaches to climate change adaptation, its links to conservation and sustainable livelihoods and how they relate to the CRiSTAL Parks process. Group work and practical application are strongly emphasized. However, each of the training sessions is different, tailored to expressed needs and available resources. Examples of completed training sessions are available through the website.

Please check the website regularly for updates about the tool and its applications (e.g., translation of the tools into different languages, development of online training materials).

We welcome your feedback on using CRiSTAL Parks, which will serve as input to improve future versions of the tool.

To learn more about CRiSTAL Parks and associated training opportunities, or simply to share your experience with the CRiSTAL Parks application, please contact us at cristal@iisd.org.

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For more information, please consult
www.cristaltool.org