CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

Response Plan

Design of a Terrestrial, Aquatic and Marine Biodiversity Monitoring Network in the Context of Climate Change

Request identification number: 2014-001-CHL-01

Requesting country: Chile

Most relevant sector: Biodiversity

Other relevant sectors: Cross-sectorial

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1. Project Summary

This project will support Chile's establishment of a Biodiversity Monitoring Network in the context of Climate Change. This monitoring network will strengthen the resilience of ecosystems and the services they provide to help society adapt to climate change. CTCN assistance will focus on the first stage of establishment and operationalization of the Monitoring Network, by supporting design of the system and removal of technical barriers for implementation. Outputs of the CTCN assistance detailed within the project description below include the design of a monitoring network; standards and protocols for monitoring, information exchange and data management; and a proposal for the formal institutional arrangements as well as requirements for network implementation. This CTCN assistance will also contribute to development of a concept and proposal for funding establishment of the system and long-term operationalization. The CTCN assistance will take place over 18 months, starting in Q3 2014, and will involve a diversity of Chilean public and private sector partners, as well as appropriate 'state-of-the-art' international technical expertise.

2. Project Description

2.1 Objectives of CTCN Assistance (outcomes and outputs)

Three main outputs are expected:

- The architectural and conceptual design of a national multi-scale and multi-institutional monitoring network for biodiversity and ecosystem integrity and its response to climate change.
- Standards and protocols for the monitoring of biological and environmental variables, climate scenarios, the Networks information exchange and data management.
- Proposal for the formal institutional arrangements and alliances as well as logistic and operational requirements including the corresponding budget for a gradual network implementation.

These outputs will have some intermediate results, such as the establishment of an inter-sectoral steering committee by the Ministry of Environment and individual reports on the identification of: i) information needs; ii) existing available information and how to access it; iii) information gaps; iv) mapping of current actors in data gathering and analysis; v) validation of the usefulness of hard- and software already in use.

As a first outcome, we expect that the CTCN assistance (CTCNa) removes the technical and technological barriers for implementation of a national biodiversity monitoring system relevant for decision-making under climate change. It is expected that the proposed CTCNa provides technical inputs for a funding request to a third party that should cover the establishment phase of the monitoring system, as well as supporting the foundation for a national policy and normative framework, as well as communication materials, that allow for long-term funding of the monitoring network.

The three phases proposed for the establishment and operation of the national biodiversity monitoring framework in Chile, indicating who is expected to provide principal technical and financial support for each phase.

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2.2 Planned Activities

Output	Activity	Sub-activity		Deliverables	Responsibility
1. Information availability and gap analysis	1.1 Information needs and gap analysis for terrestrial ecosystems and species; aquatic ecosystems and species; and marine ecosystems and species[1].	1.1.1	Public presentation of project and its scope		CTCN and Ministry of Environment
		1.1.2	Define participants and create a national steering committee or advisory board.	National steering committee created	Ministry of the Environment
		1.1.3	Identification of information needs of decision-makers (public, academic and private).	Report of interviews	Local contractors
		1.1.4	Identification of existing monitoring initiatives through document revision, electronic surveys as well as interviews with key informants; identify their actors, and the type and quality of data they provide.	Study reports for three types of ecosystems (terrestrial, wetlands, marine)	Local contractors
		1.1.5	Compare information needs with available and accessible information (relevance), with existing studies on the potential effects of climate change on biodiversity, and identify gaps between needs and availability in the context of climate change.	Gap needs report	CTCN
2. The architectural and conceptual design	2.1 First National workshop on the identification of variables that need to be measured to meet the information needs of decision makers.	2.1.1	Presentations of experiences of national biodiversity monitoring systems and early warning that consider climate change by experts from three different countries (potentially Mexico, Australia, Chile and another tbd)	Workshop program	CTCN/Steering Committee
		2.1.2	Validation of needs and gap studies.		
		2.1.3	Validation of proposed set of indicators and variables based on the previous studies.		
		2.1.4	Identification of preliminary set of indicators and variables for the national monitoring system.	Workshop report with results of different sub-activities	CTCN

[1] This activity will consist of three studies related to the three ecological areas, each of which will contemplate the three sub-activities mentioned here.

	2.2 Development of data collection protocols and data quality standards.	2.2.1	Development of draft protocol by international expert for review by national actors.	Draft protocol	CTCN
		2.2.2	International expert analysis of hard and software requirements for the implementation of the proposed protocol.	Report on system requirements	CTCN
		2.2.3	Validation and socialization of protocol and system requirements in a second national workshop with national and international experts from the LAC region.	Workshop report with results of validation	CTCN
	2.3 Development of proposal for baseline establishment[2].	2.3.1	Analysis of available information for baseline establishment.	TdR baseline study	CTCN
		2.3.2	Define short-term actions to gain access to this information.		
		2.3.3	Proposal for use of existing information and identification of needs for additional information for the baseline.		
		2.3.4	Development of ToR for baseline study.		
	2.4 Integration of study and workshop results into the conceptual and architectural design of the system[3]	2.4.1	International expert coordinates the integration of technical studies and workshops into one draft report for review and finalization with relevant national actors.	Report on conceptual and architectural design monitoring system	CTCN with support local partners
		2.4.2	Report presented to Steering committee for validation and approval.	Approval document	Steering Committee
3. Standards and protocols for collaboration	3.1 Analysis of existing standards and protocols for collaboration and information sharing.	3.1.1	Analysis of existing communication channels, standards and protocols in Chile, including those internal to the Ministry and between Ministry	Report on analysis of data sharing standards and protocols	CTCN

[2] The actual baseline study will be performed in the second phase of the monitoring system development, with additional financial resources. Such sources already have been secured for monitoring of natural forests.

[3] It is envisaged that this design will contemplate a minimum level of monitoring for which the Ministry of Environment or later the Biodiversity Service will be responsible, independent of what additional information the other partners of the monitoring network will provide.

	and information sharing			and other partners. 3.1.2 Analysis by international expert of exemplary standards and protocols in other countries		
		3.2 Elaboration of proposal for standards and protocols	3.2.1	Based on analysis in activity 3.1, international expert proposes standards and protocols for collaboration and information sharing, including best practices to ensure reliability and quality of data to be provided.	Standard and protocols proposal	CTCN
			3.2.2	Steering committee validates proposal and defines standards and protocols.	Proposal validated and approved	Steering committee
4.	Institutional arrangements and logistic and operational requirements	4.1 Identification of potential network partners and their roles	4.1.1	Steering Committee identifies potential partners based on their existing biodiversity monitoring activities, considering geographical spread of the activities and contribution to the proposed indicator framework (output 1)	Network established	Ministry of Environment with the support of CTCN
			4.1.2	Ministry of Environment negotiates partnerships within framework of protocols and standards of output 2.		
			4.1.3	Ministry of Environment establishes network.		
		4.2 Identification of technological, human and financial requirements for the establishment and operation of the system.	4.2.1	Based on second national workshop and the integration report (output 2), international expert analyses needs and existence of resources among potential network partners (activity 4.1)	Technical proposal for implementation of biodiversity monitoring system	CTCN
			4.2.2	Analysis of capacity of cutting-edge technologies to improve data collection, organization, sharing and analysis.	Financial proposal for second phase investments in monitoring system	CTCN
			4.2.3	Analysis of capacity building needs		
			4.2.4	Elaborate proposal for implementation of monitoring system (hardware and software, partners).		
			4.2.5	Presentation to steering committee of technical		

			and financial proposal for second phase investments in technological (hardware and software) and human resources.		
	4.3 Piloting with existing resources	4.3.1	Based on product 2.3 (baseline ToR) the Ministry and network partners combine existing information and establish a preliminary baseline.	Preliminary baseline analysis	MMA with support of CTCN

2.3 Main partners

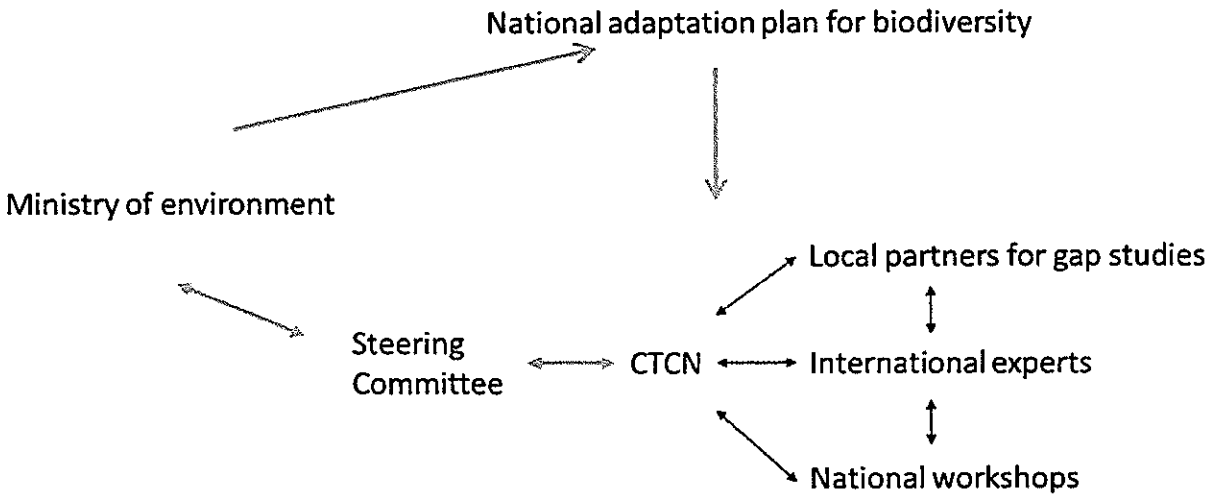
Stakeholder	Role
Ministry of the Environment (biodiversity and climate change sections)	Proponent and main client. Defines steering committee members and roles, approves progress, Chairs the steering committee, and coordinates closely with CTCN.
Ministry of Economics	NDE, monitors implementation, supports proposals for long term public policies as well as public and private financing.
INFOR	Member of steering committee; close coordination between their natural forest and biodiversity monitoring project, the Ministry of Environment and the CTCN assistance; support in preparation of second and third phase of monitoring system. Partner in GEF funded monitoring of natural forests (to be approved by GEF in 2014)
Ecology and Biodiversity Institute (IEB)	Probable member of roundtable and implementer of specific studies; data provider and user.
Center for Aquatic Studies (CEA)	Probable member of roundtable and implementer of specific studies; data provider and user.
University of Concepción	Probable member of roundtable and implementer of specific studies; data provider and user.
GIZ	Possible support for second and third phase proposal
Conicyt	Helps develop funding proposal for third phase
Other academic institutions (for example EULA, CEAZA, Centro de Cambio Global, CR2, others to be defined)	Data providers, participate in validation exercises, potential system users.
Chilean navy (Sub-secretariat), DIRECTEMAR	Data providers (climate data for coastal and ocean waters, logistical support)
SUBPESCA	Steering committee member. Data provider, participate in validation.
CONAF	Steering Committee member. Data providers,

	coordination data collection terrestrial ecosystems, participate in validation exercises, potential system users.
Directorate General of Water (DGA)	Data providers from their hydrological monitoring stations
INACH (Antarctic Institute of Chile)	Data providers for Antarctic region
Other governmental institutions (to be defined)	Potential end users, will participate in needs definition and in indicator and system validation
Private sector (to be defined, possibly in mining and hydro-electricity).	Potential end users, will participate in needs definition and in indicator and system validation
National and International NGOs (to be defined, potentially including one or two of CI, IUCN, TNC, WWF)	Potential end users, will participate in needs definition and in indicator and system validation, potential providers of information.

2.4 Implementation framework

The general framework for this response plan is the national adaptation plan for biodiversity. As part of the plan, and first priority for action, Chile proposes to set up a national biodiversity monitoring network. This network will be run by the national service for biodiversity and parks, to be set up within the first 100 days of government of the current president. It is seen as its principal instrument for the provision of reliable information on which policies and strategies for conservation and adaptation can be based. The establishment of the network is foreseen in three phases: a first design phase, a second establishment phase (including baseline study) and a third phase for the consolidation, expansion and operation of the network. The current response plan will address the first phase only, but by doing so, provide important inputs for the second and third phase as well. The second phase is envisaged to be funded with international funding, while the third phase will be ensured through long term funding by Chilean public and private sector actors.

The response plan will be supervised by a steering committee, consisting of the Ministry of Environment (chair), INFOR and other partners still to be defined. In this response plan, the CTCN partner will act as facilitator and coordinator of the activities planned. In recognition of national capacities and the need for knowing national circumstances in order to work more efficiently, national institutions will perform the gap analysis. They will also participate in the planned workshops and may be invited to become member of the steering committee. International experts will be invited to provide their technical know-how during the workshops and in the analysis of the technological, human and financial requirements for the system. The latter is expected to be an expert with international experience in the technological aspects of implementation of national biodiversity monitoring networks.



The CTCN partner will work closely with the representatives of the Ministry of Environment, INFOR, CONAF, other relevant institutions and the NDE in the implementation of the response. To that extent, CTCN will provide a response coordinator to accompany the process and represent the CTCN partner in the country in relation to this response plan.
The two national workshops are possibly the most important component of the response plan. It is during these workshops that there will be the opportunity for exchange on the state of the art at national as well as international level. It is therefore essential that prior to these workshops the best possible (Spanish speaking) experts are selected on topics such as monitoring of ecosystem functional changes as well as area-changes (e.g. changes in phenology, pests and diseases, etc), and for the different types of ecosystems (terrestrial, wetlands and marine).

2.5 Synergies

There are a number of private and public initiatives on which can be build, but that need to be evaluated for their consistence with the proposed monitoring network and its objectives. In particular worthwhile mentioning are two studies on the vulnerability of ecosystems to climate change, one from 2010[4] and two others from 2013[5], each one using a different methodology. These can be used to prioritize terrestrial

[4] study of terrestrial biodiversity vulnerability in the Mediterranean ecoregion under the context of climate change adaptation (MMA-IEB, 2010)

[5] a) a study that provides guidelines about climatic stress on terrestrial ecosystems under projected climate change scenarios for 2030 and 2050 (AGRIMED-MMA 2013) , and b) a project for the classification of terrestrial ecosystems according to their current conservation condition (IEB-MMA, 2013).

ecosystems to be monitored. CEA also has done extensive work on wetland systems. The three long term ecological study plots linked to IEB have a wealth of data and studies that should be considered and their usefulness for future biodiversity and climate change impact monitoring needs to be assessed, identifying those components of the three sites that are worth incorporating into the network or even replicating in other sites. In addition, it is worth assessing the potential to link Chile's continuous forest monitoring efforts led by CONAF to the biodiversity monitoring system. Several individual projects exist related to biodiversity monitoring and climate change impact assessments (e.g. CLIMIFORAD, led by INFOR). These will need to be identified and their usefulness for the national biodiversity monitoring system to be assessed. Finally, INFOR has been responsible for the design and implementation of the national forest inventory with 5x7 km permanent sample plots in the nation's natural forests. As a second phase of the forest inventories, they are now in the process of adding specific biodiversity information. To that extent, they have identified plant and animal indicators and are starting to validate monitoring protocols in a 300 000 ha pilot project. They will expand this monitoring to national scale through a GEF funded project, for which the PIF has already been approved and the full project proposal is expected to be approved during 2014. It will be essential that during the CTCN assistance the relation between the MMA biodiversity monitoring network and the INFOR work is clarified, since INFOR could provide the framework for terrestrial ecosystem monitoring, recognizes the need for monitoring of aquatic ecosystems (rivers and wetlands) as well as marine and coastal ecosystems, but has not yet incorporated these in their monitoring proposal. Thus, CTCN assistance could focus on international validation of the indicators and protocols used by INFOR, and the establishment of a fully integrated monitoring system that considers INFORs inputs as well as those of other organizations and other types of ecosystems.

2.6 Timeline

	2014				2015			
Activity	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Activity 1.1 Needs and gap analysis								
Sub-activity 1.1.1								
Sub-activity 1.1.2								
Sub-activity 1.1.3								
Activity 2.1 National variables workshop								
Sub-activity 2.1.1								
Sub-activity 2.1.2								
Sub-activity 2.1.3								
Sub-activity 2.1.4								
Activity 2.2 Data protocols and standards workshop								
Sub-activity 2.2.1								
Sub-activity 2.2.2								
Sub-activity 2.2.3								
Activity 2.3 proposal baseline establishment								
Sub-activity 2.3.1								
Sub-activity 2.3.2								
Sub-activity 2.3.3								
Activity 2.4 conceptual and architectural design								
Sub-activity 2.4.1								
Sub-activity 2.4.2								
Activity 3.1 analysis standards information sharing								
Sub-activity 3.1.1								
Sub-activity 3.1.2								
Activity 3.2 proposal standards info sharing								
Sub-activity 3.2.1								
Sub-activity3.2.2								
Activity 4.1 potential network partners								
Sub-activity 4.1.1								
Sub-activity 4.1.2								
Sub-activity 4.1.3								
Activity 4.2 resource requirements								
Sub-activity 4.2.1								
Sub-activity 4.2.2								
Sub-activity 4.2.3								
Sub-activity 4.2.4								
Sub-activity 4.2.5								

2.7 Indicative budget

The total budget dedicated to this project by CTCN will be USD 250,000.

2.8 Expected long-term results

Once the monitoring network is operational, it is further expected that Chilean's environmental policies improve and that economic and other sectoral policies integrate environmental considerations. It is expected that this will improve the effectiveness and efficiency of ongoing private and public sector investments in environmental protection and restoration. In addition, Chile will be able to act opportunely upon the presence of human, natural and climate threats to biodiversity, which, in some cases, may help prevent over-use and extinction of commercially important species.

Conservation of natural resources has the additional benefit that the carbon stored in these resources will not be released, and, where conservation implies restoration of degraded sources, will contribute to sequestration of carbon dioxide, contributing thus to mitigation of climate change.

2.9 Monitoring

The nature of the activities allow for a natural monitoring of the activities based on the reports to be provided by the CTCN assistance (see deliverables detailed activity plan). Reports need to be accepted by the steering committee members, which meet to receive and discuss the reports. The NDE will be responsible for feedback on the timely implementation of the activities and the reports, stimulating all parners to timely delivery and responses.