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| **Country:** | URUGUAY |  | **Title:** | *Development of technological tools to evaluate the impacts of, and vulnerability and adaptation to, climate change in Uruguay’s coastal zone.* |
| **Request Identification Number:** | 2015000074 |  |

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| **Overview of the CTCN technical assistance** |
| *Over the course of its history, Uruguay’s coastal zone has played a significant role in the country’s development. Uruguay’s coastline is 670 km long, 450 km of which correspond to the Río de la Plata and the remaining 220 km to the Atlantic Ocean. The coastal departments (Colonia, San José, Montevideo, Canelones, Maldonado and Rocha) currently account for 70% of the total population, 71% of private households and a little more than 72% of housing in Uruguay. Most of the places identified in the coastal areas (59%) are predominantly involved in tourism. Recent regional studies conducted for Latin America and the Caribbean (LAC) found that the incidence of extreme sea levels increased between 1950 and 2008, with a greater magnitude and frequency being noted in the coastal areas of the Caribbean and Río de la Plata, and Montevideo specifically classified as one of the continent’s most exposed cities.*  *In this context, the objective of the requested technical assistance will be a transfer of technological tools to quantify the potential impacts of climate change in coastal areas, applying them to the adaptation processes identified in Uruguay. To achieve this objective, the location, frequency and intensity of threats caused by climate variability and change will be determined across different temporal and spatial horizons of the coastal zone, taking into consideration different socioeconomic recipients and focusing on local capacity-building for the monitoring of these threats and their possible consequences.*  *This will enable the country’s transition to the* *integrated management of the coastal zone, which will contribute to human well-being and the economic development of the tourism sector. The Uruguayan government has set itself the objective of developing a National Climate Change Policy that will provide a regulatory framework within which to produce, in the short-term, a National Adaptation Plan for the Coastal Sector, incorporating the outputs obtained from applying the technology developed with the support of the CTCN technical assistance.* |

1. **Overview of the CTCN technical assistance**
   1. **Technology aspects**

Recent regional studies conducted for Latin America and the Caribbean (Reguero et al, 2015) found that, between 1950 and 2008, the incidence of extreme sea levels increased, with a greater magnitude and frequency being noted in the coastal areas of the Caribbean and Río de la Plata, and Montevideo specifically classified as one of the continent’s most exposed cities. Sudden flooding has occurred in Río de la Plata due to a combination of meteorological and hydrological effects (Verocai et al 2014). The simultaneous occurrence of extra-high high tides alongside large, atmospherically induced storm surges have raised the mean sea level (MSL) by as much as 3 m above its usual height (0.91 m), leading to the stripping of beaches and dunes, damage to coastal infrastructure and risks to navigation. Extreme events (> 2.5 m high) occur once every 11 months, principally during spring and autumn (Verocai et al 2014).

Faced with this situation, the Uruguayan government has set itself the objective of developing a National Adaptation Plan containing detailed information on the threats, exposure, sensitivities and adaptive capacities of the human and natural systems in coastal zones. Regional information systems already exist for these threats but their resolution is insufficient to be able to draw up local and national plans on the basis of this information. With this technical assistance, the proposal is to build on existing global/regional systems, increasing their resolution in order to be able to feed directly into decision-making processes on prioritization and adaptation strategies.

* 1. **Objectives (outcomes)**

The overall objective of this assistance is to ascertain the threat to, and exposure and sensitivity of, Uruguay’s coastal zone with regard to climate variability and change. More specifically, the main objective is to **analyse and assess the effects in terms of the dynamics of beaches, dune zones, coastal erosion, risks of flooding and effects on ecosystems, infrastructure and the population living along the coast, as well as on productive activities such as tourism.** This information will indicate how the country needs to adapt in the future, enabling actions, strategies and the necessary resources to be determined for the country’s adaptation and transition to the integrated management of the coastal zone, which will contribute to human well-being and the economic development of the tourism sector.

To achieve the overall objective, the following specific objectives have been set:

1. Estimate, based on climate change scenarios, the foreseeable future changes in the marine dynamic.
2. Assess the effects that these changes in the marine dynamic may have on different natural environments and human uses of the coast.
3. Determine the location, frequency and intensity (degree) of threats caused by climate change across different temporal horizons and for different geographic or socioeconomic recipients.
4. Build local capacity to monitor these threats and their possible consequences.
   1. **Results (outputs expected from CTCN assistance)**

The country’s expected outputs from CTCN assistance are:

1. A document summarizing other countries’ experiences in terms of determining the threats to, and exposure and sensitivity of, sea coasts, which will enable the methodology to be adapted to the best existing technology and determine the scope of the information produced (activity 1).
2. Logical structure of a database with links to databases in other relevant institutions and cooperation agreements between institutions (activity 2).
3. Databases of historic dynamics and their projections according to different carbon-concentrating mechanisms (CCM) for the different relevant variables in order to determine the vulnerability of Uruguay’s coastal zones (activity 3).
4. Technical document on the methodology and results (graphic) of analysis of potential impacts along the coast and in a pilot coastal zone (activity 4).
5. Risks and impacts atlas (activity 5).
6. User manual for the applications and other training materials (activity 5).
   1. **Expected use of outputs**

As the beneficiary country, Uruguay, will have a database of variables associated with the marine dynamic (wind, pressure, sea swell, meteorological tides, sea level) based on high-resolution temporal information. The data will be calibrated and contrasted with the instrumental information available in the country, thus forming a baseline for many other high-interest applications such as the integrated management of coastal zones, operational oceanography, infrastructure construction, risk management in coastal areas, ecosystem resilience and tourism management. This will provide a methodology and high-resolution output with which to assess the climate change risk in coastal areas, which may also contribute to the sustainable management of the coastal zone. The country’s technological training and capacity will be improved both within academia and within the national government, departmental governments and private sector.

1. **Description of the Assistance**
   1. **Activities**

**Activity 1: Review international experiences and propose the variables to be used for the Uruguay’s coastal zone**

**Activity 1.1. Review international experiences**

It is essential to summarize similar experiences already existing in different parts of the world to ground the methodology to be applied and to be able to evaluate the strengths and weaknesses of the database, once developed. Studies implemented regionally in LAC as well as locally in LAC and the countries of the EU will be analysed. This information can also be used for future technical assistance in other countries. The output will be a technical document summarizing the experiences and analysing the variables used in other countries.

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| **Deliverable** | **Delivery date** |
| *Document summarizing other countries’ experiences of determining the threats to, and exposure and sensitivity of, sea coasts* | *Week 7* |

A**ctivity 1.2 Proposed variables**

On the basis of this document, variables for Uruguay will be proposed, to be validated in the workshop in activity 2.

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| **Deliverable** | **Delivery date** |
| *Report containing the proposed variables to be measured in Uruguay* | *Week 11* |

**Activity 2: Databases available in Uruguay**

Prior to initiating the rest of the tasks to be implemented within the project, a compilation of existing databases will need to be made.

**Activity 2.1 Gathering information**

Gathering information will focus on national and regional instrumental and numeric-modelling databases that can be used to feed into the tasks to be implemented in the context of the project. This will involve the participation of national technicians/researchers who will manage and compile the necessary information. Two videoconferences will be held to establish the team from the Ministry of Housing, Land Planning and Environment (MVOTMA) and CTCN that will validate the proposed variables, propose the structure of the database and draw up the work schedule.

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| **Deliverables** | **Delivery date** |
| *Record of agreements reached between the CTCN team and the institutions participating in the project: videoconference to present the technical assistance and validate the variables to be measured* | *Week 5* |
| *List of nationally available instrumental and numeric-modelling databases* | *Week 14* |
| *Report containing the draft database structure* | *Week 16* |

**Activity 2.2 Inter-institutional launch workshop**

The technology transfer will take place simultaneously at different institutions around the country, both managerial and academic (see table of actors). For this reason, the content of the proposal (variables to be measured, database format) and outputs, along with their application in Uruguay, will be validated via a launch workshop. This one-day workshop will be organized by MVOTMA with the involvement of the CTCN TA Coordinator. In preparation for and to follow-up on this workshop, there will also be an initial meeting along with a series of internal and external meetings to validate the information gathered and the analyses of the information.

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| **Deliverables** | **Delivery date** |
| *Report of launch workshop with national and departmental authorities* | *Week 10* |

**Activity 3: Analysis of the effect of climate change and variability in Uruguay**

The objective of this task is to develop a standardized meteo-oceanic database for the whole of Uruguay’s coast and marine zone, focused on climate change scenarios to estimate the foreseeable future changes in the marine dynamic.

**Activity 3.1 Historical databases of dynamics**

For the construction of historical databases of dynamics, a database will be created that contains an historical reconstruction of the dynamics that define the risk to the coast (wind, swell, flow, sea level and currents). The point of departure will be the database developed by the C3A project (50 km resolution), improving it to obtain long historical reconstructions (of at least 30 years) with an hourly temporal resolution and a spatial resolution of less than 5 km. Once these historical databases (sea winds, continental hydrological contribution along the coast, sea level, swell, currents) have been generated, they will require validation with comments to assess their quality and climatic characterization.

The historical database of marine dynamics will be implemented within MVOTMA’s Environmental Information System, where it will be available to all users. As part of this activity, a three-day workshop will be held on the database and modelling for those responsible for the system and its immediate users.

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| **Deliverable** | **Delivery date** |
| *Historical database of dynamics established within MVOTMA’s Environmental Information System* | *Week 32* |

**Activity 3.2 Projections of climate change dynamics**

To analyse the possible effect of climate change on a regional scale along the length of the country’s coast, estimated regional changes in temperature, mean sea level and precipitation will be assessed on the basis of different CCMs from the IPCC’s AR5. In addition, climate change projections will be obtained for the IPCC’s different CCM scenarios for marine wave dynamics and the meteorological component of sea level based on statistical downscaling techniques. This activity will focus on joint work developed by the CTCN in cooperation with national technicians as the counterpart, making existing information available and supporting the production of projections. The national technicians are included in the ARAUCLIMA proposal.

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| **Deliverable** | **Delivery date** |
| *Report on projections of climate change dynamics* | *Week 36* |

**Activity 4: Evaluation of the effects of climate change on Uruguay’s coastal zone**

Assess the effects that climate change may have on the marine dynamic in different natural environments and on the human uses of the coast.

**Activity 4.1:** **Analysis of coastal impacts due to climate change at the national level**

The objective of this task is to estimate the potential impact of flooding and erosion along the Uruguayan coast using the outputs from activity 3 and indicators or models that accord with the national scale of the problem, as agreed at a meeting between experts and decision makers. This analysis will give an overall picture of the potential impact along the length of the coast, making it possible to identify areas of greater exposure and greater sensitivity to the hazards. This study will consider a differentiated approach for women and vulnerable population groups, taking into account age range and sex.

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| **Deliverables** | **Delivery date** |
| *Graphic outputs on the impacts of erosion caused by the combined effect of flooding and erosion on the Uruguayan coastal zone* | *Week 39* |
| *Technical report on the methodology and criteria applied* | *Week 40* |

**Activity 4.2: High-resolution study of impacts and risk in pilot coastal zones**

The objective of this task is to present an integrated methodology for evaluating the risk associated with flooding and erosion on a high resolution by means of its application in pilot zones. The methodology will be applied along a section of coast selected for this study in order to ascertain the socioeconomic and environmental consequences associated with flooding (taking into account both the sensitivity and adaptive capacity of the systems) and corresponding changes in risk for different climate change scenarios. In addition, a study will be conducted focused on the potential impact of erosion in which a high-resolution analysis will be conducted and the combined effects of flooding and erosion will be considered.

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| **Deliverables** | **Delivery date** |
| *Graphic outputs on the impacts of erosion caused by the combined effect of flooding and erosion in six pilot sites established by MVOTMA.* | *Week 38* |
| *Technical report on the methodology and criteria applied.* | *Week 39* |

**Activity 5: Technology transfer**

To develop the work of technology transfer, training and education associated with the project.

**Activity 5.1: Documentation of the process and its results**

* **Atlas of Risks and Impacts along the Uruguayan coast**

The objective of this task is to produce an atlas of the Uruguayan coast which sets out the results of activities 2 and 3. The atlas will include a series of risk sheets with a summary of the historical dynamics and projections, along with impacts, plus information on national-level flooding and erosion.

* **User Manual**

Based on the work, studies and knowledge obtained, and as a way of facilitating the use of the outputs generated, a document will be produced containing the methodology applied throughout the process and setting out the results of each activity.

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| **Deliverables** | **Delivery date** |
| *Atlas of Risks and Impacts on the coast* | *Week 40* |
| *User Manual* | *Week 41* |

**Activity 5.2:** **Training**

A training course will be provided to the staff of government departments, universities, research centres and relevant actors in Uruguay on the basis of the work, studies and knowledge obtained. The course is scheduled to last no more than one week, with a maximum of 30 hours. It includes theoretical and practical training on developing and using the databases as well as on the techniques and modelling with which to analyse the impact of climate change on the coast.

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| **Deliverables** | **Delivery date** |
| *Training course materials* | *Week 42* |
| *Summary User Manual for managers* | *Week 44* |

**Activity 6: Monitoring and evaluation**

This activity consists of coordinating, monitoring and evaluating the response plan in line with the proposals in section 3.4 and its table of indicators of performance. It also consists of preparing a final report that summarizes the deliverables obtained and the lessons learned in the process of obtaining them. Furthermore, it will summarize the main risks and potential impacts identified in the process in an interactive digital map, differentiating as far as possible the risks and impacts by gender and vulnerable population groups.

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| **Deliverables** | **Delivery date** |
| *Final report containing an executive summary of lessons learned* | *Week 47* |
| *Summary map identifying risks and impacts* | *Week 47* |

* 1. **Synergies and baseline setting**

This process of proposal preparation will be initiated by MVOTMA’s Climate Change Division (DCC), which has spent eight years implementing adaptation measures in Uruguay’s coastal zone in coordination with the national government and local governments (Project UNDP-GEF URU/07/G32). The DCC has acted as coordinating body between all the institutions listed in the table of key stakeholders in this document, and has generated, shared and exchanged information on vulnerability and adaptation to climate variability and change with all of them. To date, the DCC has organized 30 workshops and more than 15 national and international consultants have been hired to produce documents and reports addressing the need for analysis of climate information, the selection of adaptation measures and the implementation of specific actions in the coastal zone. To mark the end of the project, the national government, through MVOTMA, has begun the process of drafting a National Adaptation Plan for the Coastal Sector (PNAC) and is at the same time aiming to strengthen the country’s climate services. Adaptation proposals are currently available for the country’s six coastal departments. All of these recognize the need to generate adapted information with which to address current coastal processes, bearing in mind future climate variability and change scenarios, with the aim of implementing sustainable adaptation measures. Moreover, previous academic studies make clear that Uruguay needs a tool to analyse the vulnerability of the coastal zone as a whole and which, in surn, will facilitate local analyses in order to address regional and sectoral impacts. Through its Subnational Development and Management Programme, the Planning and Budgeting Office of the Presidency of the Republic, together with the Ministry of Tourism, is supporting the process of producing adaptation projects for coastal areas to ensure access to national funds for their implementation. In this context, improving the management and use of climate, hydrological and oceanic information will result in the efficient implementation of the projects mentioned above while helping ensure the country has a strong PNAC from the outset and in parallel.

Alongside this technical assistance, the Government of Uruguay has approved another initiative through ARAUCLIMA that focuses primarily on components of capacity-building and developing the policy and regulatory framework for adaptation in coastal zones. As its overall objective, it will seek to identify the threats and transform the information generated into concrete action plans.

* Define and create a robust information system with reference to the dynamic maritime coastal process.
* Undertake studies on the possible impacts of a change in sea behaviour caused by climate change along the Uruguayan coast.
* Create an atlas of impacts with reference to flood events along both the estuary and oceanic coastlines.
* Encourage the replicability of the experience both locally and regionally.

As the specific outcomes of the ARAUCLIMA initiative have been set jointly with technical assistance provided by the CTCN, the above points are shared between both parties.

* 1. **Timeline**

| **Activity** | **MONTH** | | | | | | | | | | | |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| **1 Coordination and management** |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.1 Review of international experiences and proposal of variables |  | . |  |  |  |  |  |  |  |  |  |  |
| Deliverable 1.1: summary document |  |  |  |  |  |  |  |  |  |  |  |  |
| 1.2 Proposal of variables |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 1.2: report on proposed variables |  |  |  |  |  |  |  |  |  |  |  |  |
| **2 Gathering information and launch** |  |  |  |  |  |  |  |  |  |  |  |  |
| 2.1 Gathering information |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 2.1: record of agreements |  |  |  |  |  |  |  |  |  |  |  |  |
| Review and previous data |  |  |  |  |  |  |  |  |  |  |  |  |
| Historical instrumental and numeric-modelling marine dynamics data |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 2.2: list of databases |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 2.3: report on draft database structure |  |  |  |  |  |  |  |  |  |  |  |  |
| 2.2 Inter-institutional launch workshop |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 2.4: workshop report |  |  |  |  |  |  |  |  |  |  |  |  |
| Kick-off. |  |  |  |  |  |  |  |  |  |  |  |  |
| Internal meetings of the CTCN-MVOTMA coordinating group and external meetings involving MVOTMA and the institutions participating in the proposal |  |  |  |  |  |  |  |  |  |  |  |  |
| **3 Analysis of the effect of climate variability and change** |  |  |  |  |  |  |  |  |  |  |  |  |
| 3.1 Historical databases of dynamics |  |  |  |  |  |  |  |  |  |  |  |  |
| Winds |  |  |  |  |  |  |  |  |  |  |  |  |
| Waves |  |  |  |  |  |  |  |  |  |  |  |  |
| Sea level / currents |  |  |  |  |  |  |  |  |  |  |  |  |
| Flow / rains |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 3.1: database |  |  |  |  |  |  |  |  |  |  |  |  |
| 3.2 Projections of climate change dynamics |  |  |  |  |  |  |  |  |  |  |  |  |
| Mean sea level |  |  |  |  |  |  |  |  |  |  |  |  |
| Temperature and precipitation |  |  |  |  |  |  |  |  |  |  |  |  |
| Storm surge |  |  |  |  |  |  |  |  |  |  |  |  |
| Waves |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 3.2: projections report |  |  |  |  |  |  |  |  |  |  |  |  |
| **4 Effects of Climate Change** |  |  |  |  |  |  |  |  |  |  |  |  |
| 4.1 Analysis of coastal impacts of climate change at the national level |  |  |  |  |  |  |  |  |  |  |  |  |
| Flood analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| Erosion analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 4.1: graphic outputs |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 4.2: technical report |  |  |  |  |  |  |  |  |  |  |  |  |
| 4.2 High-resolution study of impacts and risk in six pilot coastal zones |  |  |  |  |  |  |  |  |  |  |  |  |
| Flood analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| Socioeconomic risk analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| Erosion analysis |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 4.3: graphic outputs |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 4.4: technical report |  |  |  |  |  |  |  |  |  |  |  |  |
| **5 Technology transfer, training and education** |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.1 Atlas of Risk and Impacts along the Uruguayan coast |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 5.1: atlas |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 5.2: user manual for applications |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.2 Training |  |  |  |  |  |  |  |  |  |  |  |  |
| Course |  |  |  |  |  |  |  |  |  |  |  |  |
| Transfer of methodology |  |  |  |  |  |  |  |  |  |  |  |  |
| Transfer of outcomes |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 5.3: course materials |  |  |  |  |  |  |  |  |  |  |  |  |
| Deliverable 5.4: manual for managers |  |  |  |  |  |  |  |  |  |  |  |  |
| **6 Monitoring and evaluation** |  |  |  |  |  |  |  |  |  |  |  |  |
| 6.1 Final report |  |  |  |  |  |  |  |  |  |  |  |  |
| Executive summary containing lessons learned with regard to progress, achievements and challenges for the impact assessment of climate change in the coastal zone of Uruguay. |  |  |  |  |  |  |  |  |  |  |  |  |
| Summary map identifying risks and impacts. |  |  |  |  |  |  |  |  |  |  |  |  |

* 1. **Expertise required**

Please list the expertise, materials and other resources required to successfully implement the CTCN assistance and reach the expected objectives. This will constitute the basis for developing the activity-based budget of the CTCN assistance.

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| **Activity 1** |  |
| Coordinator, senior engineer specializing in coasts or oceanography and climate change or similar | Coordinate activities, provide link to Uruguay government; responsible for reviewing experiences and proposing variables for the database (5 days) |
| Junior specialist in oceanography | Support coordination and preparation of documents (19 days) |
| Materials |  |
| Other | Coordination visit (1) |
| **Activity 2** |  |
| Coordinator, senior engineer specializing in coasts or oceanography and climate change or similar | Presentation of prepared materials and technical assistance (20 days) |
| Junior specialist | Support for gathering information (45 days) |
| Local consultant | Workshop logistical support (5 days) |
| Administrator | Support for administrative supervision |
| Event 1 | Workshop comprising government institutions, academics and NGOs on the gathering and potential use of information on coastal hazards |
| Materials |  |
| Other |  |
| **Activity 3** |  |
| Coordinator, senior specialist in oceanography and climate change or similar | Validation of information gathered on issues within their area of specialization; analysis of historical series and projections; identification of threats (20 days) |
| Climate change specialist, meteorologist | Validation of information gathered on issues within their area of specialization; analysis of historical series and projections; identification of threats (20 days) |
| Specialist in waves and/or wind | Validation of information gathered on issues within their area of specialization; analysis of historical series and projections; identification of threats (10 days) |
| Specialist in database design and implementation | Design and development of database; responsible for reliability of information (60 days) |
| Specialist in modelling | Responsible for modelling future projections of threats (50 days) |
| Specialist in ICT | Support for the digitization and analysis of data (110 days) |
| Local consultant | Support to identify databases, monitor agreements between organizations (50 days) |
| Local consultant | Workshop support (5 days) |
| Administrator | Support for administrative supervision (26 days) |
| Event | Validation workshop |
| **Activity 4** |  |
| Specialist in coastal and climate change management | Analysis of potential impacts (27 days) |
| Junior specialist in data analysis | Support for the analysis of potential impacts (25 days) |
| Local consultant | Workshop logistical support (9 days) |
| Event | Meeting/workshop to define impacts and scope of analysis; 15 participants |
| Administrator | Support for administrative supervision (9 days) |
| Materials |  |
| Other | Coordinator travel |
| **Activity 5** |  |
| Senior specialist in oceanography | Design and supervision of documents (17 days) |
| Specialist in physical sciences and/or mathematics or similar with skill in writing for technicians | Design and production of documents (40 days) |
| Specialist in wave modelling | Documentary review in line with their area of specialization (5 days) |
| Local consultant | Workshop logistical support (7 days) |
| Administrator | Support for administrative supervision (8 days) |
| Materials |  |
| Other | Workshop |
| **Activity 6** |  |
| Coordinator, senior engineer specializing in coasts or oceanography and climate change or similar | Production of final report with executive summary and summary map of risks and impacts (2 days) |
| Gender specialist | Differentiated approach to women and vulnerable groups (2 days) |
| Administrator | Support for administrative supervision (3 days) |
| Materials |  |
| Other |  |

* 1. **Main partners**

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| **Stakeholder** | **Role to support the implementation of the CTCN assistance** |
| Climate Change Division, MVOTMA[[1]](#footnote-1) | Partner and hub for inter-institutional coordination  Promotion of national, local-government and private training bodies |
| National Environmental Department, MVOTMA | Coastal and Marine Management Department  Provider and user of information for the implementation of regional and local integrated coastal management  Division for Environmental Information  Repository for technological tools and generator of information for government users (National government: Ministry of Housing, Land Planning and Environment, Ministry of National Defence, Ministry of Transport and Public Works, Ministry of Tourism, National Emergencies System; Local governments: departments and town halls) and private users (tourism operators) |
| National Land Planning Department, MVOTMA | Provider and user of information for the implementation of local land-use plans in the coastal departments |
| National Water Department, MVOTMA | User of information for the implementation of coastal watershed management (Atlantic Ocean, Santa Lucía, Río de la Plata) through the Watershed Committees |
| Working Group on Coastal Adaptation of the National Climate Change Response System, MVOTMA | System for inter-institutional coordination |
| Ministry of Social Development, MIDES | Social Observatory, provider of information for the socioeconomic characterization of the coastal departments |
| Agency of Electronic Government and the Information and Knowledge Society, AGESIC | Provider of information with which to develop the MDT |
| Uruguayan Meteorological Institute | Information provider and dynamic model user |
| Ministry of National Defence, MDN | Information provider and dynamic model user |
| Ministry of Tourism, MinTur | Information provider and dynamic model user |
| National Hydrography Department, Ministry of Transport and Public Works, MTOP | Information provider and dynamic model user |
| National Emergencies System, Presidency | User at the level of developing early warnings of extreme events in vulnerable coastal zones |
| Departmental governments of Colonia, San José, Montevideo, Canelones, Maldonado, Rocha | User of information for the implementation of local land-use plans, risk management and implementation of adaptation measures within the framework of the National Adaptation Plan for the Coastal Sector |
| University of the Republic, UdelaR | User of information and provider of climate services through dynamic models for the coastal and marine area |

**2.6 Indicative budget**

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| **Activities** | **Estimated Budget (USD)** |
| Activity 1 | 8,000 |
| Activity 2 | 30,000 |
| Activity 3 | 134,000 |
| Activity 4 | 33,000 |
| Activity 5 | 43,000 |
| Activity 6 | 2,000 |
| **Total** | **250,000** |

Implementation of this response plan will be led by the Climate Technology Centre (including the selection, contracting, supervision and monitoring of implementation partners) in close coordination with the corresponding National Designated Entity and relevant national actors. Implementation will be led by an International Consortium or Network Partner of CTCN.

**2.7 Gender considerations**

Gender aspects will be considered in two specific ways:

* A differentiated approach for women.
* Vulnerable groups reflected in the population study during the risk analysis, taking into account age range and sex.

**2.8 Risk identification and risk mitigation**

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk** | **Consequence** | **Probability** | **Mitigation measure** |
| There is not enough local data | It will not be possible to make high-resolution projections and analyses | Medium | Use global databases with corresponding adaptation to the necessary scales |
| Errors in models and/or data entry | Unreliable results | Low | Continual validation of data and models by experts |
| No interest from national institutions | The results will not be comprehensive | Low | Include national counterparts from the very start of the activities |

1. **Long-term impacts of the assistance**

**3.1 Expected climate change-related benefits**

|  |  |  |
| --- | --- | --- |
|  | **CTCN climate technology impact** | **Anticipated contribution from CTCN assistance** |
| **1** | Climate technologies adapted to the national context are identified and prioritized to enable their deployment in and/or transfer to the requesting countries | * The country will have the technology to evaluate the impacts of, and vulnerability and adaptation to, climate change in the coastal zone. |
| **2** | A new national technology needs assessment and technology action plan as a result of the response |  |
| **3** | Progress made with mitigation objectives (e.g. reduction in energy consumption or intensity of carbon emissions.) as a result of the response |  |
| **4** | Progress made with adaptation or resilience objectives (e.g. climate vulnerability index improvement) as a result of the response | * The identification of risks related to climate variability and change will be improved as a result of implementing the technological tool. |
| **5** | New mitigation or adaptation technology projects/initiatives implemented as a result of the response | * The needs of new adaptation projects in the study zones will be prioritized. |
| **6** | New or strengthened policies/ laws developed, approved and enacted as a result of the response | * The information generated will serve as a basis for the diagnostic of the vulnerability of the coastal zone, laying the foundations for the production of the National Adaptation Plan for the Coastal Sector, within the framework of the National Climate Change Policy that is being formulated over the course of 2016. |
| **7** | New policies/laws where climate change was mainstreamed as a result of the response | * National Climate Change Policy * National Adaptation Plan for the Coastal Sector. |
| **8** | Country integrating climate change mitigation and/or adaptation issues into its planning and policies as a result of the response | * The TA meets the needs indicated in the Five-Year Strategy for the National Climate Change Response System and the National Adaptation Plan for the Coastal Sector, and the results contribute to the more efficient and effective implementation of these policy instruments. |
| **9** | New or strengthened public-private partnerships created as a result of the response |  |
| **10** | New or strengthened twinning arrangement created as a result of the response | * The results of this TA contribute to implementing the Interministerial Agreement for work focused on the National Climate Change Response System. |
| **11** | Increased capacity to access and attract public and private finance to fund technology deployment | * The local governments will have robust information for implementing erosion and flooding adaptation measures. This will enable them to access national public investment funds. |
| **12** | Post-response intervention funding attributable to the response |  |
| **13** | Framework and analysis of local production developed to enable national production of climate technologies |  |

**3.2 Co-benefits**

|  |  |  |
| --- | --- | --- |
|  | **Sustainable Development Goal** | **Contribution from CTCN assistance** |
| **1** | End poverty in all its forms everywhere |  |
| **2** | End hunger, achieve food security and improved nutrition, and promote sustainable agriculture |  |
| **3** | Ensure healthy lives and promote well-being for all at all ages |  |
| **4** | Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all |  |
| **5** | Achieve gender equality and empower all women and girls |  |
| **6** | Ensure availability and sustainable management of water and sanitation for all |  |
| **7** | Ensure access to affordable, reliable, sustainable, and modern energy for all |  |
| **8** | Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all | Contributes to the sustainability / resilience of the tourism sector with a special emphasis on resorts and coastal towns. |
| **9** | Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation |  |
| **10** | Reduce inequality within and among countries |  |
| **11** | Make cities and human settlements inclusive, safe, resilient and sustainable | Defining the impacts on and assessing the vulnerability of the selected pilot sites will build local capacity for the implementation of adaptation measures through local governments. |
| **12** | Ensure sustainable consumption and production patterns |  |
| **13** | Take urgent action to combat climate change and its impacts | There will be a methodology and high-resolution outputs to ascertain climate change risk in coastal areas and it will also be possible to use this to contribute to the sustainable management of coastal zones. |
| **14** | Conserve and sustainably use the oceans, seas and marine resources for sustainable development | There will be a database of indicators of trends in variables as well as a database of indicators of impact that can be used to prioritize strategies for action. |
| **15** | Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss |  |
| **16** | Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels |  |
| **17** | Strengthen the means of implementation and revitalize the global partnership for sustainable development |  |

**3.3. Post-assistance plans and actions**

The data will be calibrated and contrasted with instrumental information available within the country (tide gauges) and/or from international sources (e.g. buoys or Atlantic satellite data), thus forming a baseline for many other high-interest applications such as the integrated management of costal zones, operational oceanography, infrastructure construction, risk management in the coastal zone, ecosystem resilience and tourism management. It will also provide information for different scenarios with the same variables across different temporal horizons (2030, 2050, 2100).

There will be a database of indicators of trends in variables as well as a database of indicators of impacts that can be used to prioritize strategies for action. With the support of ARAUCLIMA, this data will be used to design adaptation actions and strategies.

Based on the information produced, and with the support of ARAUCLIMA, the country’s technology training and capacity will be improved both within academia and within the national government, local governments and private sector.

**3.4 Monitoring and reporting of technical assistance results and impacts**

The activities and milestones expected from this technical assistance are described in detail in sections 1.3, 2.1 and 3 and the table of performance indicators given below (see also the framework in Annex 1 to this response plan). The progress and results of the activities will be supervised by MVOTMA (National Designated Entity) and the CTCN. MVOTMA will be responsible for verifying progress in the technical assistance against a timeline and associated milestones and for communicating its outcomes to the CTCN. Each month, a conference call will take place between the parties involved in the implementation to communicate progress in the technical assistance, challenges arising and any adjustments that are needed. MVOTMA will be responsible for organizing this. Once implementation of the technical assistance has ended, MVOTMA will provide a summary of lessons learned from all implemented activities, reflecting on the progress and achievements made and challenges encountered. Any changes suggested in the activities, processes and/or approaches as indicated in the response plan will need to be accepted by the CTCN before they can be applied.

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| **Performance indicators of CTCN Assistance** | | | | |
| **Response output**  (linking to sec 1.2) | **How output will be used to ensure creation of result** | **Expected result** | **Expected outcome of result**  (linking to sec 1.1) | **Anticipated impact that outcome will produce**  (link to sec 3) |
| Summary document of experiences | The description and analysis of methodologies for determining coastal hazards and impacts of climate change will be used as inputs for validating the methodology | Based on experiences and evidence from other countries, the methodology will be adapted to the country’s needs | Methodology for gathering and analysing information in an efficient and effective manner | Incorporation of practical improvements into the information gathering and analysis methodology |
| Partnership agreements | They set out who will contribute what information and under what conditions | Institutions are collaborating with appropriate information | Identification of availability of information and institutional capacities | Access to better available information |
| Historic databases of dynamics and their projections | Input for modelling | Modelling of the history of hazards and impacts and their projections | Vulnerable zones and possible adaptation actions or strategies identified on the basis of models (supported by ARAUCLIMA) | Impact on coastal zones reduced |
| Technical document on methodology and results | Materials to strengthen the capacities of technicians from institutions relevant to monitoring | Capacity-building | The technicians are applying their new skills to develop and implement a system for monitoring hazards and impacts (supported by ARAUCLIMA) | Continual adjustment of adaptation actions and strategies; Contribution to SDG 11, 13 and 14 |
| Atlas of risk |
| User manual and other training materials |

1. **Signatures**

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| --- | --- |
| **Signatures of the requesting country** |  |
| **NDE** | **Request proponent** |
| Name: | Name: |
| Title: | Title: |
| Date: | Date: |
| Signature: | Signature: |
| **Signatures of the CTCN** |  |
| **CTCN Director** | **Climate Technology Manager** |
| Name: | Name: |
| Title: | Title: |
| Date: | Date: |
| Signature: | Signature: |

**Annex 1: Response Logframe**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Activity**  (link to sec 2) | **Description of sub-activities conducted by the CTCN** | **Output/ Deliverable**  (link to sec 2.9) | **Expected Outcome**  (link to sec 3) | **Main national partners involved** | **Objectively Verifiable Indicator**  (see Annex 5 guidance) | **Means of Verification** (data source, method of collection, responsibility and periodicity) | |
| *Activity 1:*  *Review of experiences* | *Activity 1.1 Review of experiences*  *Activity 1.2 Analysis of possible variables to be measured* | 1.1 Summary document of experiences  1.2 Proposal of variables to be measured | Climate technologies are identified and prioritized, adapted to the national context | MVOTMA Uruguay | 1.1 Scope of study (sources used, countries considered)  1.2 Acceptance of the proposed variables | 1.1 Document  1.2 Records of meetings and workshops |
| *Activity 2:* *Gathering information and launch* | *Activity 2.1 Gathering information*  *Activity 2.2 Inter-institutional launch workshop* | 2.1 Agreements reached  2.2 and 2.3 Lists of databases  2.4 and 2.5 Agreed structure of database  2.6 Detailed timetable  2.7 Report of launch workshop | Agreements on new tools or tools strengthened as a result of the response | MVOTMA, UDELAR, SOHMA, INUMET, IGM, MTOP, MINTUR | Level of detail used,  ease of use | Existence of documents |
| *Activity 3: Historical databases* | *Activity 3.1 Historical databases of dynamics*  *Activity 3.2 Projections of climate change dynamics* | *3.1 Historical database of dynamics established in MVOTMA’s Environmental Information System* | Risk identification related to climate variability and change will be improved as a result of implementing the technological tool | MVOTMA | 3.1 Database resolution  3.2 Variables used  3.3. Database reliability | Review of databases |
| *Activity 4:*  *Effects of Climate Change* | *Activity 4.1 Analysis of the coastal impacts of climate change at the national level*  *Activity 4.2 High-Resolution study of impacts and risk in six pilot coastal zones* | 4.1 Graphic outputs on the impacts of erosion caused by the combined effect of flooding and erosion at the chosen pilot site  4.2 Technical report on the methodology and criteria applied | Risk identification related to climate variability and change will be improved as a result of implementing the technological tools.  The needs of new adaptation projects in the study zones will be prioritized | Local academic institutions | Number of variables initially defined that have adequate information for their analysis  Resolution of the information | Technical document, graphic outputs |
| *Activity 5: Technology transfer, training and education* | *Activity 5.1 Atlas of Risk and Impacts along the Uruguayan coast*  *Activity 5.2 Training* | Atlas document  User Manual for applications  Training materials | Capacity-building for technicians from relevant institutions | IH Cantabria, MVOTMA, UDELAR, SOHMA, INUMET, IGM, MTOP, MINTUR, COASTAL DEPARTMENTAL GOVERNMENTS | Number of technicians reached  Number of technicians involved in gathering information and analysis | Training reports  Survey of technicians who attended the training sessions |
| *Activity 6: Monitoring and evaluation* | *Systematization of lessons learned* | Final Report | Decision makers will have access to up-to-date information on the climate |  |  |  |

1. MVOTMA: Ministry of Housing, Land Planning and Environment. [↑](#footnote-ref-1)