

NCAP Workplan - Colombia

-edited summary-

"Building capacity for improve adaptability to sea level rise in two vulnerable points (Tumaco-Pacific coast and Cartagena-Caribbean coast) in the Colombian coastal areas"

Prepared by: INVEMAR

1. Background

Colombia ratified the United Nations Framework Convention on Climate Change by means of Law 164 of 1995. The Republic of Colombia is part of the Convention since June 20, 1995, the date on which it entered into force for the country. In the same way, Colombia ratified the Kyoto Protocol by means of Law 629 of December 27, 2000, whose constitutionality was accepted by the Constitutional Court under Sentence C-860 of April 15, 2001 and accepted as an instrument of ratification by the Secretariat of the Convention in November, 2001.

As a Party to the UNFCCC, Colombia has prepared and submitted to the Conference of Parties (COP) its first national communication, with funding from the Global Environment Facility. This communication, compiled by the "Instituto de Hidrología, Meteorología y Estudios Ambientales - IDEAM" (the Institute of Hydrology, Meteorology and Environmental Studies – IDEAM), was officially presented to the U.N. Climate Change Secretariat in March, 2002. It contains the first official inventory of emissions of greenhouse gases in Colombia for the period 1990-1994. Likewise, it shows that although Colombia's contribution to global emissions of greenhouse gases is between 0.2 and 0.3%, the country's high vulnerability to the social, economic and environmental effects of climate change justifies the carrying out of measures to mitigate their causes and consequences.

Guidelines of the Policy on Climate Change. In July, 2000 the National Environmental Council, which represents different sectors of the economy and the community and is the country's highest ranking collegiate body for national environmental policy, approved the "National Guidelines for Climate Change Policy". The objective of the document is to identify the strategies required for consolidating the capacity the nation needs to respond to possible threats from climate change, live up to the provisions of the Kyoto Convention and Protocol by maximizing opportunities deriving from their financial mechanisms, and comply with the commitments that have been undertaken.

A very significant input for the First National Communication was the study "Definition of vulnerability to climate change on sea-level of the bio-geophysical and socio-economic systems of the Colombian coastal zone". With the aim of carrying out an initial identification of the impacts of the phenomenon of climate change on the coastal zone of the nation, a study, supported by the government of the Netherlands (NCCSAP). The study analyses the bio-physical and socio-economic impacts of the phenomenon on the region of the Pacific, Caribbean and island coasts of Colombia. This study is a mechanism for the implementation of policies for the integral management of coastal zones and a tool for governmental authorities in the difficult task of making decisions about the effects of climate change and the rise in the sea level. This study was elaborated by INVEMAR¹.

¹ Instituto de Investigaciones Marinas y Costeras, José Benito Vives De Andreis (Marine and Coastal Research Institute)

As a result of the first phase of the NCCSAP program, a national action plan within the actual country institutional and planning scenario was elaborated. In this plan concrete actions for the short and medium term were identified: a) Knowledge and information, b) Planning, c) Institutional capacity building, d) Education and public awareness, d) International negotiation, e) Economical and financial aspects. Moreover, seven critical zones were identified along the coasts: The Archipelago of San Andrés, Providencia y Santa Catalina in the Colombian Insular area of the Caribbean; Cartagena; Barranquilla, and Santa Marta in the Caribbean continental coast of Colombia; and Tumaco, and Buenaventura in the Colombian Pacific. Also, case study areas: The Guapi-Iscuandé area and Tumaco in the Pacific and the Gulf of Morrosquillo – Sinú River Delta in the Caribbean Coast. All these areas should be addressed in future studies related to impact reduction and adaptability (INVEMAR, 2003).

Following the results of the first phase, it is proposed to continue with the development of a second phase in which pilot areas are studied for its adaptability, chosen from the critical areas or study cases identified in the first phase.

2. Study Area

Colombia is the fourth-largest country in South America and the only one with coasts on both the Pacific and Caribbean Ocean. Is located between the 4° S to 12° N and 68° to 79° W, with a total area of 2,070,408 km², of which almost 1,142,000 Km² are continental mainland and islands, and some 929,000 km² are jurisdictional waters². The study area includes two vulnerable areas to sea level rise, which are Tumaco in the pacific coast and Cartagena in the Caribbean coastal zone.

The study area will include: (1) The maritime-coastal subzone: a variable width area comprised between the Mean Low Tide and the external border of the continental platform; (2) The transitional subzone: the area between Mean Low Tide to Mean High Tide. The width of this subzone is basically conditioned by the tidal rank (3,7 m in average for the Pacific coast and 0,5 m in average for the Caribbean coast) and the topography of the coast; and (3) The terrestrial subzone: the area between Mean High Tide and a parallel line inland located about 2 km from the urban outmost limits of the Tumaco and Cartagena's municipalities.

3. Problem Description

Climate Change studies in Colombia have given an overview of the national vulnerability to accelerated sea level rise (ASLR) in terms of the magnitude of its impacts, the response capability measured in terms of the gross domestic product (GDP) compromised in the construction of adaptation strategies and the possibility of the implementation of response options. However, Colombia does not have studies that have addressed adaptation in a detailed scale. In fact, there is not enough data that would lead to the documentation of a long history of adaptations of certain economic sectors to natural hazards, which could also lead to the evaluation of new sectoral strategies, based on scientific observations, to handle adaptation to climate change.

According to the Colombian vulnerability assessment to climate change, Tumaco and Cartagena make part of the most vulnerable places to sea level rise in the Colombian

² Sierra-Correa, 2001

coastline. Important economics sectors takes place in these cities as well there are a high incidence of poverty affecting a large number of population living in risk areas (intertidal areas). For these areas, the Action Plan advise a further analysis for researching on a detailed scale regarding variables such as susceptibility, degree of exposition, feasible adaptation measures and capacity building. The current proposal is addressed to the implementation of the Action Plan.

Currently, decision making within the economic sectors does not takes into account their capacity for adaptation to climate change, as a result, their development policies does not recognize potential effects (whether positive or negative) of Climate Change nor institutional capacity has been built-up for the incorporation of specific adaptation strategies accordingly to the vulnerability of the coastal zone.

There is a lack of a comprehensive methodological and conceptual framework for the decision making on socioeconomic and environmental problems since a integrated approach. A enhanced capacity to evaluate adaptation measures to climate change gives an opportunity for planning the coastal zone development taking into account sea level rise effects on vulnerable human communities and economic sectors.

As it is mentioned in the Action Plan derived from NCCSAP I, international technical and financial assistance for the development of adaptability studies for Climate Change should be a key element for the Country. In recent years national security problems have taken over the importance of budgetary decisions within the general developing plans in Colombia, however Climate Change should increase its importance since it could lead to increase social and economic vulnerability of certain groups or sectors, moreover it could jeopardize economic progress of coastal zones.

4. Objectives

General Objective

To build capacity for improve adaptability to sea level rise in two vulnerable points (Tumaco-Pacific coast and Cartagena-Caribbean coast) in the Colombian coastal areas, through identifying, assessing and implementing adaptation measures by research in new methods, as a basis for the preparation of a National Policy of Climate Change (coastal zone sector).

Specific Objectives

- Detail the susceptibility degree and exposition of the biophysical (i.e. geofoms and ecosystems) and socioeconomic (i.e. social groups with poverty conditions and economic sectors) elements to sea level change in the Tumaco and Cartagena critical areas.
- Identify and development of adaptation strategies for each critical area in order to implement the local policy on coastal zone and climate change topics.
- Assess the identified adaptation measures by a multicriteria decision matrix.
- Design a policy options analysis take into account the scope of legislative existing instruments of coastal zone articulating the recommended adaptation strategies within the national policies and determinate inconsistencies and missing elements about climate change topics.
- Generate public awareness through the promotion of the communities participation, development educational strategy and project results

- communications in order to prepare the population and institutions for the potential climate change events on coastal zones.
- Establish international co-operation (especially between Colombia and The Netherlands, but also with other countries with experience in Coastal Zone Adaptability Assessments).

5. Conceptual and Methodological Framework

The current proposal is based on the conceptual and methodological framework developed by UNFCCC, IPCC (2000; 2001) and UNEP-IVM (2000) and other recent literature. The proposal is addressed by the adaptation concept, a very broad concept which will be defined as the process that accomplish all those responses to climate change that may be used to reduce vulnerability (Burton et al, 1992). Looking for definite the adaptation measures on a specific response category it is important to point out that the scientific research will be use in order to identified new adaptation methods for reducing vulnerability and to build institutional capacity.

The research will be focused on two vulnerable or critical areas to sea level rise (i.e. inundation effect specially) selected from NCCSAP I. They are Tumaco and Cartagena as an attempt to cover the most vulnerable areas in the Pacific and Caribbean coast respectively. Under the conceptual framework of coastal zone management, some sectors will be include in the analysis, some of them are ecosystem management, soil protection, prevention of disasters and education.

The objective of the research in adaptation is to provide to decision makers with information and understanding about vulnerability and adaptation measures.

With the aim to reach objectives above mentioned, it is expected to evaluated different practices and technologies for avoiding or minimizing the adverse climate change impacts.

Take into account the susceptibility analysis about biophysical aspects in each vulnerable areas, the areas at risk and inundation areas will be defined. The impacts over the socioeconomic system will be identified and quantified using the common methodology. The projections based on pre-establish scenarios with and without sea level rise; and present and future situation including those scenarios, will be development. Finally the profile of detailed vulnerability for each areas (Tumaco and Cartagena) will be establish including the response options (prevention possibilities) and accurate measures and their implementation in order to adaptation to sea level rise (IPCC, 1997)

A decision matrix based on multi-criteria analysis is the methodology that will be used in order to make an assessment of adaptation measures and to provide the decision makers with a useful tool for integrated management of coastal zone taking into account the current potential effects of sea level rise. A participative approach will be implemented for identifying criteria and implementing results.

A decision matrix is the selected methodology for developing the proposal taking into account the moderate requirements of resources (suitable for data availability in Colombia), its moderate level of precision and its ability to address uncertainties.

The Policy Options Analysis, in agreement with GIWA (Global International Waters Assessment) methodology will be based on different steps to propose and analyze different alternatives. The previous Causal Chain Analysis establishes some root causes of

environmental priority problems (i.e. vulnerability of sea level rise on coastal areas). The policy options are suggested to attend those environmental concerns' roots causes. The options could be grouped in agreement with the subject they cover, for example, technological, knowledge, economical, governance or demographic causes, among others. After establishing a clear definition for each kind of group the priority alternatives analysis should be made, considering Effectiveness, Efficiency, Equity, Political feasibility and Implementation capacity for each alternative. The Principal alternatives are selected by a scoring exercise and analyzed considering the same factors already mentioned, but with more detail.

In order to generate public awareness, the methodology includes the collaborative process, which mean working together effectively on issues, problems and situations of mutual interest (communities and institutions) in the project. Collaboration creates opportunities to assume shared responsibilities for sustaining natural and social systems included in the specific objectives of the proposal. In the same way, the methodology for development educational strategy includes the workshops with "Delphi" and "ZOP" process. For divulgation, the proposal includes the brochure or small document with results provided by the project in order to prepare the population and institutions for the potential climate change events on coastal zones.

All results can be available on the INVEMAR's web page.

6. **Expected Results (Outputs)**

- Detailed assessments on vulnerability to sea level rise specially on human communities under poverty conditions and on key economic sector for the coastal zone development in Tumaco and Cartagena critical areas.
- A set of feasible adaptation measures and guidelines available for decision makers and recommendations for other municipalities in the coastal areas.
- Multicriteria Decision Matrix
- A major background of information for reporting to the UNFCCC and for participating in the international policy-making on climate change
- An enhanced institutional capacity and coordinated linking processes between private and public sectors by means of information, education and training processes for stakeholders.
- A base document for the elaboration and implementation of the National Policy for adaptability to Climate Change on key socioeconomic sectors in the coastal zone.
- Divulgation brochure or small document with results provided by the project.

7. **Stakeholders**

Responsible of the development Proposal

COLOMBIA

- Ministry of Environment, Housing and Territorial Development –MAVDT-

- Marine and Coastal Research Institute –INVEMAR-

The Netherlands

- Ambassade van het Koninkrijk der Nederlanden
- ETC Foundation - Netherlands Ministry of Foreign Affairs

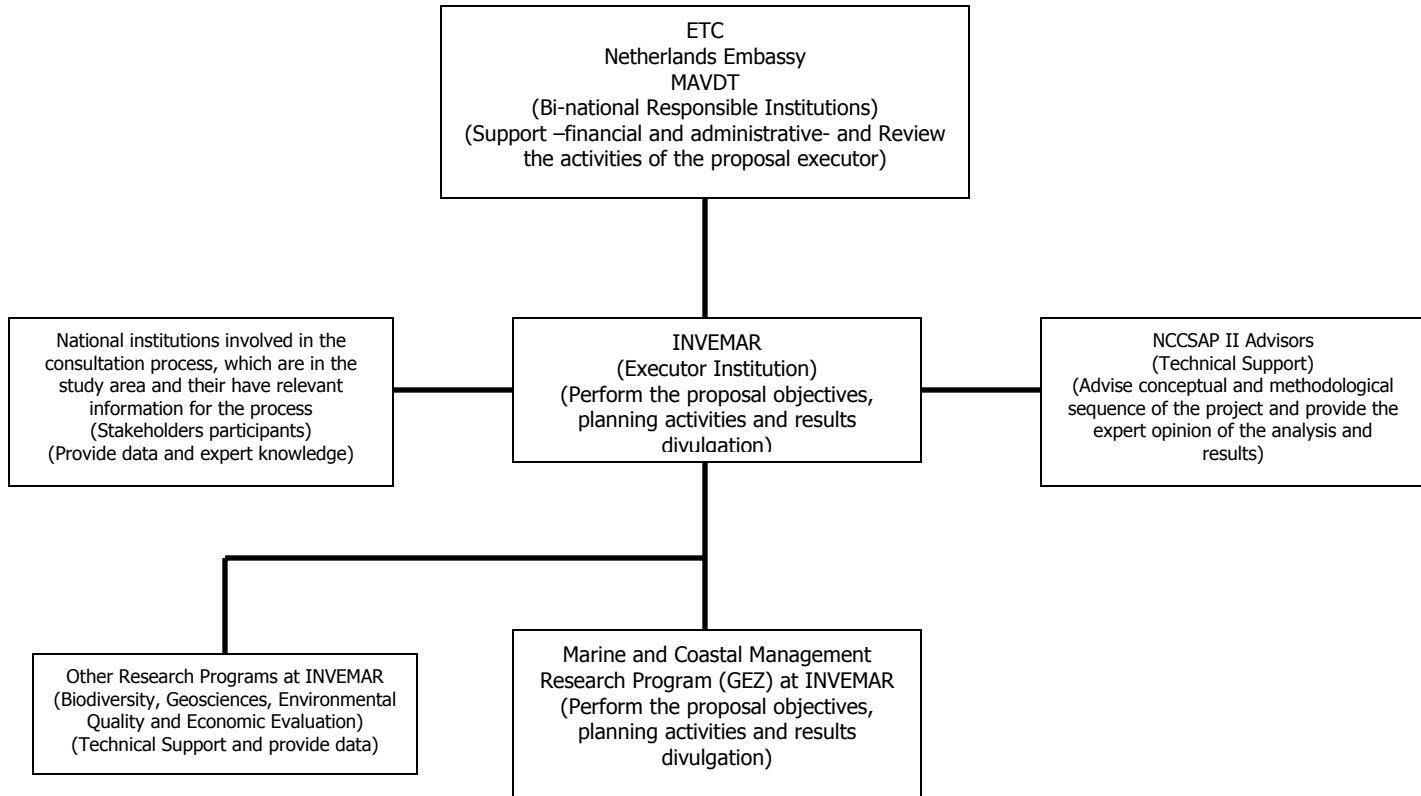
Beneficiaries

- Tumaco and Cartagena communities living in risk areas.
- Stakeholders belonging to the tourism and mangrove management sectors.
- Institutions in charge of disaster prevention, housing and physical development.
- Institutions in charge of environmental management (Environmental Autonomus Corporations).
- Institutions in charge of environmental education and community participation.

National Institutions involved in the consultation process of the project which are in the study area and their have relevant information for the process

- Ministry of Agriculture
- National Planning Department (DNP)
- Administrative Department of National Statistics (DANE)
- Environmental Research Institute of the Pacific (IIAP)
- Institute of Hydrology, Meteorology and Environmental Research (IDEAM)
- Institute of Biological Research "Alexander Von Humboldt" (IAVH)
- Regional Environmental Autonomus Corporations (CAR)
- Institute of Geosciences, Environmental-Mining and Nuclear Research and Information (INGEOMINAS).
- Geographic Institute "Agustín Codazzi" (IGAC).
- Institute of Rural Development (INCODER)
- Oceanographic and Hydrographic Research Center (CIOH) and Pacific Control Center of Pollution (CPPS)
- Municipalities
- Economic Sectors
- Academic Sectors
- Environmental ONG 's
- Tumaco and Cartagena communities

8. Organizational Framework and Coordination Mechanism



Annex (Logical Framework Matrix-Proposal Summary)

Specific objectives	Activities	Expected Results (outputs)	Indicators		
Detail the susceptibility degree and exposition of the biophysical (i.e. geofoms and ecosystems) and socioeconomic (i.e. social groups with poverty conditions and economic sectors) elements to sea level change in the Tumaco and Cartagena critical areas.	Identification of the susceptibility of the biophysical system	Detailed profile of vulnerability in the Tumaco and Cartagena critical areas.	Technical document with VA detailed profile.		
	Quantification of the impacts over the socioeconomic system				
	Determination of the capacity for generate the responses and strategies				
Identify and development of adaptation strategies for each critical area in order to implement the local policy on coastal zone and climate change topics.	Development the methodological sheets for data colection	Opcion de posibles medidas de adaptación para cada una de las areas críticas	Number of methodological sheets for data colection.		
	Identification adaptation measures (different options and their characteristics)		List of adaptation measures		
	Validation and complement of the adaptation measures for each critical areas (Tumaco and Cartagena) through expert opinion-workshops.		Technical document with adaptation measures and their characteristics		
Assess the identified adaptation measures by a multicriteria decision matrix.	Identification of the criteria for evaluating measures using a participative methodology	A set of feasible adaptation measures for the decision making process	Enhable Institutions with access to the decision matrix		
	Designing indicators for the criteria				
	Feeding the matrix with qualitative and quantitative information				
	Designing strategies to show and communicate the results				
Design a policy options analysis take into account the scope of legislative existing instruments of coastal zone articulating the recommended adaptation strategies within the national policies and determinate inconsistencies and missing elements about climate change topics.	Analysis of outcomes and products	Proposal for local institutional framework for the policies and normative articulation.	Proposal of legislative and normative reform in order to articulate the climate change and coastal zone issues.		
	Review and analysis the existing policies, legislation and normativity of the coastal zone and climate change in Colombia, and recognition of the profits, inconsistencies and deficiencies.				
	Proposal for local institutional framework contributing with the articulation of different policies and actions in coastal zone taking into account the climate change impacts.				
	Establishment some root causes of VA in local areas (Tumaco and Cartagena)			Causal Chain Analysis	Matrix with causal chain analysis
	Suggestion of policy options in the local areas			Policy options Analysis	Document with policy options analysis involving other results of this objective
After establishing a clear definition for each kind of group the priority alternatives analysis should be made, considering Effectiveness, Efficiency, Equity, Political feasibility and Implementation capacity for each alternative					
Generate public awareness through the promotion of the communities participation, development educational strategy and project results communications in order to prepare the population and institutions for the potential climate change events on coastal zones.	Selection of principal alternatives by a scoring exercise.	Generation of public awareness.	Workshops for consultation process and results divulgation		
	Socialization and concertation of the results derived from objectives 1 to 3 through workshop and consultation process. This activity is permanent through out the time of the project.		Brochure or small document preparation. Its includes results provided by the project in order to prepare the population and institutions for the potential climate change events on coastal zones	Brochure	
Establish international co-operation (especially between Colombia and The Netherlands, but also with other countries with experience in Coastal Zone Adaptability Assessments).	Working together INVEMAR and NCCSAP technical advisors, as well as other national and international institutions.	Increase the quality of the analysis and results of the project.	Technical workshops or meetings		

-end.