



Adaptation to the risks of climate change in the RIOCC countries

José Manuel Moreno Rodríguez, coordinator of RIOCCADAPT project, UCLM, Spain

Clara Laguna-Defior, scientific-technical secretary of RIOCCADAPT project, UCLM, Spain



INTRODUCTION

The **Iberoamerican Network of Climate Change Offices (RIOCC)** (www.riocc.es) is a governmental network that aim at collaborating and coordinating the response against climate change of the Spanish and Portuguese speaking countries of the Americas and the Iberian Peninsula.

The **RIOCC countries meet regularly to exchange experiences and identify future actions that could benefit all members.** Sharing the experiences implemented in the region against climate change as well as identifying climate change risks and adaptation needs is a main issue for countries that are among the most threatened by global warming.

The objectives of the RIOCCADAPT project (www.rioccadapt.es) were to **assess climate change risks and adaptation actions implemented throughout the RIOCC countries.** Both planned and autonomous adaptation actions have been analyzed for a total of 15 systems and sectors, which include different natural resources and systems, the most relevant climatic hazards and other key sectors [Table 1].

In addition, **RIOCCADAPT Report** makes visible the experience and practices being implemented in RIOCC countries by analyzing a set of selected case studies that could serve as examples of how to face certain risks.

The report has been conceived to serve as a resource for regional decision makers or other national and international agents, and to provide the general public information about how climate change adaptation needs are being faced by Iberoamerican countries.

Table 1. Systems and sectors covered in the RIOCCADAPT report.

Thematic area	Chapter	Topics addressed in each chapter
I. General Introduction	1	Conceptual Framework and Regional Context.
	2	Society, Governance, Inequality, and Adaptation.
II. Natural systems	3	Terrestrial and Freshwater Ecosystems
	4	Coastal and Marine Ecosystems
	5	Biodiversity
III. Managed systems	6	Water Resources
	7	Agriculture Sector
	8	Fishing Resources
IV. Climate disaster risks	9	Storms and Hurricanes
	10	Floods and Droughts
	11	Slope Instability and Landslides
	12	Wildfires
	13	Urban and Rural Settlements
V. Other key areas and sectors	14	Coastal Areas
	15	Tourism
	16	Human Health

APPROACH

The **RIOCCADAPT Report** has been drafted by researchers from RIOCC countries. Each chapter has been coordinated by a lead author – who, in general, had experience in drafting assessment reports, i.e., had participated in the Intergovernmental Panel on Climate Change (IPCC) – who has been assisted by several contributing authors from the academia or management areas. The report was subjected to two rounds of review among experts and governments. Assessment of progress in adaptation was addressed from several perspectives [Figure 1] and for the different subregions within the RIOCC territories [Figure 2].

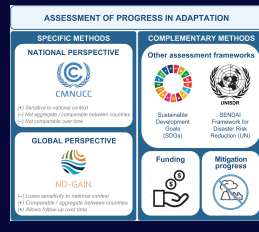


Figure 1. Diagram of the main methods for assessing progress in adaptation to climate change. Source: compiled by author based on UNEP reports on adaptation assessment. Source: compiled by the authors based on UNEP 2016, 2017.

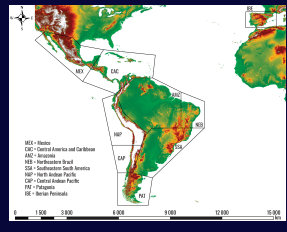
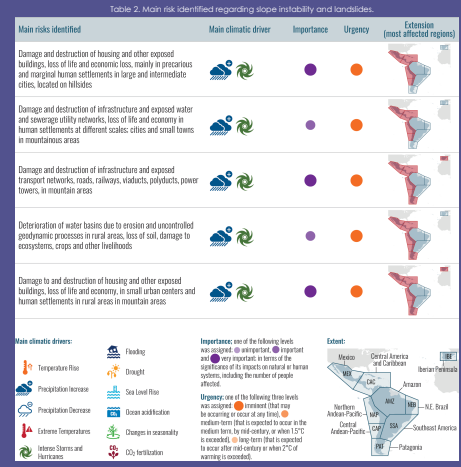


Figure 2. Topographical map of RIOCC countries and geographical division used in this report. Source: NASA. Source: compiled by the authors based on Magin et al. (2014) and Seneweit et al. (2012).

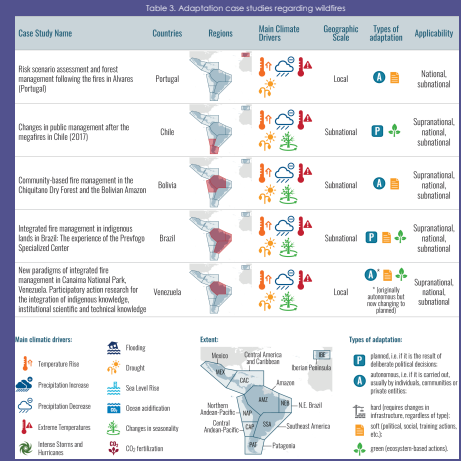
MAIN RISKS

For every sector in **Table 1** the main risks were identified and then related to the corresponding climatic or social drivers, their urgency and regional distribution. For example, **Table 2** summarizes the main risks identified regarding **slope instability and landslides** (Chapter 11 of **RIOCCADAPT report**).



CASE STUDIES

Each chapter and sector had several case studies of actions implemented that could serve as examples of (mostly) autonomous actions in response to changes in climate and other stressors. Examples of relevant case studies were compiled summarizing the climatic driver, geographic scale, type of adaptation and applicability in summary figures. For example, **Table 3** summarizes case studies regarding wildfires (Chapter 12 of **RIOCCADAPT report**).



ADAPTATION ACTIONS

For every sector analyzed in the RIOCCADAPT project, adaptation actions being implemented were assessed. The following figure summarizes the corresponding climatic drivers, geographic scale, implementation status and region. For example, **Figures 3 and 4** summarize some relevant adaptation actions regarding **fish resources** and **human health** sectors (**Chapter 09** and **Chapter 16** of **RIOCCADAPT report** respectively).

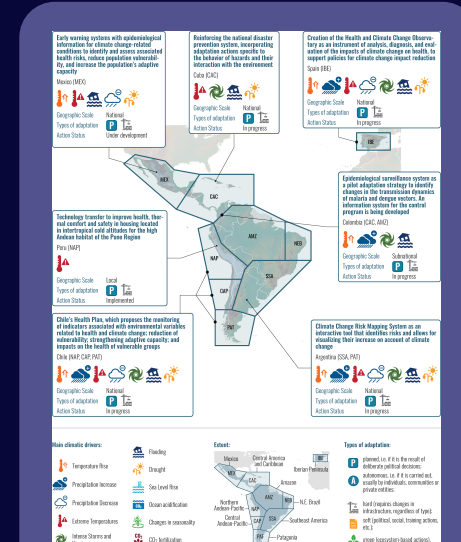


Figure 3. Examples of adaptation actions for fisheries sector.

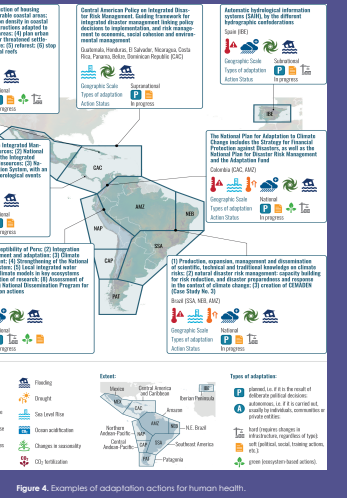


Figure 4. Examples of adaptation actions for human health.

INTERACTIONS TABLE

For every sector analyzed in RIOCCADAPT project, the main adaptation options were analyzed in terms of **co-benefits** and **trade-offs** versus mitigation, Sustainable Development Goals, and priorities of the Sendai Framework. For example, **Table 4** summarizes these interactions for the **agriculture** sector (**Chapter 07** of **RIOCCADAPT report**).

Table 4. Interactions in terms of co-benefits and trade-offs regarding the agriculture sector.

Adaptation action (1)	Mitigation	Prevention of Land Degradation	Ecosystem and Biodiversity Protection	Food Security	Health	Gender Equality	Water	SDG (2)	Sendai (3)
Monitoring and early warning systems for extreme weather events (droughts, storms, hailstorms, frosts, etc.)	+	+	+	+	+	+	+	SDG 13, SDG 14	+
Water storage and pumping irrigation systems	+	+	+	+	+	+	+	SDG 6, SDG 7, SDG 13, SDG 14	+
New varieties and types of crops and animals, resistant to droughts and pest and insect outbreaks	+	+	+	+	+	+	+	SDG 2, SDG 13, SDG 14	+
Use of traditional methods and techniques	+	+	+	+	+	+	+	SDG 13, SDG 14	+
Changes in animal and plant production sites	+	+	+	+	+	+	+	SDG 13, SDG 14	+
Soil and water conservation	+	+	+	+	+	+	+	SDG 6, SDG 13, SDG 14	+
Loss insurance systems	+	+	+	+	+	+	+	SDG 13, SDG 14	+
Zoning	+	+	+	+	+	+	+	SDG 13, SDG 14	+

(1) An assessment was conducted for the different parameters shown in the table (highlighted risk prevention, etc.) for each of the actions based on the authors' criteria, coded with green circles (or +) in the case of the benefits, with red circles (or -) in the case of mitigation and/or co-benefits, and with a grey dot (or =) in the case of neutral or non-quantifiable interactions.

(2) In addition of each of the actions, SDG 5 and Sendai-related interaction in this table, using numbers that show the actions' contribution to specific SDGs or priorities under the Sendai framework.

(3) Sendai Framework priorities: (1) Understanding Disaster Risk; (2) Strengthening disaster risk governance to manage disaster risk; (3) Investing in disaster risk reduction for resilience; (4) Enhancing disaster preparedness for effective response, and for "Build Back Better" recovery, rehabilitation and reconstruction.

(4) Sustainable Development Goals (SDG): SDG 1, No Poverty; SDG 2, Zero Hunger and Sustainable Agriculture; SDG 3, Good Health and Well-being; SDG 4, Quality Education; SDG 5, Gender Equality; SDG 6, Clean Water and Sanitation; SDG 7, Affordable and Clean Energy; SDG 8, Decent Work and Economic Growth; SDG 9, Industry, Innovation and Infrastructure; SDG 10, Reduced Inequalities; SDG 11, Sustainable Cities and Communities; SDG 12, Responsible Production and Consumption; SDG 13, Climate Action; SDG 14, Life Below Water; SDG 15, Life on Land.

FUTURE NEEDS

• Enhancing information and data availability on threats/vulnerability/exposure; risks; adaptation options; Good quality data/information by sector, at different scales (from supranational to local); regularly updated; Availability; information/data must be accessible to scientists; managers; decision makers, etc.; Support for scientific research on the state of ecosystems / resources / socioeconomic aspects / etc.; Relationships between actors involved (institutions; managers; academia; affected population; industry).

• Evaluation of the effectiveness of adaptation actions; Vulnerability and risk assessment; Design of tools to assess adaptation needs; Cost / benefit analysis; from economic / social / environmental point of view; Design of indicators of effectiveness of adaptation; Systematic monitoring of adaptation actions; Monitoring / evaluation of the results of adaptation actions.

• Development of public policies; Financing; allocate resources for the implementation of planned and autonomous adaptation measures; monitoring; research; dissemination; etc.; Facilitate/encourage capacity building at different levels (from supranational to local) for the implementation of adaptation measures; Technical assistance by sector; Strengthening governance and participatory processes; Coordination; cross-cutting; socio-environmental; development policies and related aspects (economic, risk management, poverty reduction; environmental protection, etc.); Synergies with mitigation and sustainable development (among others).

• Socio-environmental aspects; Protection of ecosystems / biodiversity (marine and continental) through conservation, restoration or rehabilitation; Recognition of environmental services of ecosystems (water; resources; protection; etc.); Good planning practices; urban planning; infrastructure development; changes in land use; resource exploitation, etc.; Information and early warning systems for extreme events (prevention rather than reaction); Strengthening of social and environmental resilience; Recognition of updated traditional knowledge for resource management and adaptation.

How to get access to the report?

The report [Moreno, J.M., C. Laguna-Defior, V. Barros, E. Calvo Buendía, J.A. Marenco, and U. Oswald Spring (eds.), 2020: Adaptation to Climate Change Risks in Ibero-American Countries — RIOCCADAPT Report, McGraw-Hill, Madrid, Spain, 676 pp.] can be downloaded as a whole or by chapters, either in Spanish or English, with the summary for policy makers being also available in Portuguese, at: <http://rioccadapt.com/>.

Acknowledgements

RIOCCADAPT was funded by the Spanish Agency for International Cooperation and Development (AECID) through ARAUCLIMA (a regional program for Latin America and the Caribbean about climate change and environment). It also counted with the support of the Climate Change Spanish Office (OECC) and the RIOCC countries through their corresponding focal points.