

## 6.0 Ecuador

CAN	Comunidad Andina (Andean Community of Nations)
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza (Spain) (Tropical Agriculture Research and Higher Education Centre)
CIFOR	Center for International Forestry Research
ECLAC	Economic Commission for Latin America and the Caribbean
ENSO	El Niño Southern Oscillation
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (Germany)
IADB	Inter-American Development Bank
IAI	Inter-American Institute for Global Change Research
INIA	Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (Chile) (National Institute of Agricultural Research)
OAS	Organization of American States
PACC	Programa de Adaptación al Cambio Climático (Adaptation to Climate Change Programme)
RIOCC	Red Iberoamericana de Oficinas de Cambio Climático (Ibero-American Network of Climate Change Offices)
SCCF	Special Climate Change Fund
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
WWF	World Wildlife Fund

### A. Adaptation Needs and Priorities

Climate variability in Ecuador is currently largely associated with El Niño Southern Oscillation (ENSO) events. El Niño years bring much more rainfall and floods in the coastal plains and western Andes, but the northwestern and eastern parts can experience droughts at the same time (Ministerio del Ambiente, 2000). In the decades to come, models used in development of Ecuador's First National Communication to the United Nations Framework Convention on Climate Change project that mean annual temperatures will increase

by 1° to 2°C. Greater uncertainty exists with projected changes in average rainfall, with models ranging from a decline of 15 per cent to an increase of 20 per cent (Ministerio del Ambiente, 2000). Although a timeline for these changes is not indicated in the National Communication, subsequent vulnerability studies suggest the horizon is 2030.

Ecuador's First National Communication also presents vulnerability assessments for agriculture, forestry, coastal zones and water. Along with each sectoral vulnerability assessment, it suggests a number of adaptation measures for each sector (Ministerio del Ambiente, 2000):

- *Agriculture*: Agro-ecological zoning and adjusted seasons for sowing and harvesting; introduction of higher-yield varieties; irrigation; suitable use of fertilizers; and pest and disease control systems.
- *Forestry*: Protective forest plantations; sustainable management of production plantations; integrated rural development in watersheds; agroforestry and woodland/grazing land systems; forestry protection against pests and disease; protection against forest fires; sustainable management of native forests; sustainable management of fragile ecosystems; and a comprehensive anti-desertification program.
- *Coastal zones*: Establishment of a biophysical monitoring and climate change surveillance program; adjustment of the sewage system for the city of Guayaquil; adjustment of a clean water system for the city of Guayaquil; mangrove protection and reforestation; adjustment of shrimp farming systems; establishment of withdrawal lines, buffer zones and urban protection borders; adjustment and maintenance of road drainage systems; and the hydraulic fill for densely populated urban zones.

Notable, no measures for the water sector were identified.

The National Communication notes that implementation of its proposed measures will require institutional and technological cooperation, training and information, as well as financial resources. It also recommends that vulnerability assessments be undertaken for sectors such as health, fishing and fragile ecosystems, including mountain zones and those with erosion problems and droughts. Further assessments are suggested for agriculture and coastal areas, and an extension of the adaptation analysis to the water sector is proposed.

Beyond the National Communication, the Ecuador's climate change policy proposed in the National Development Plan highlights fragile ecosystems such as peat lands, mangroves and wetlands, infrastructure and food security in the context of adaptation (República del Ecuador, 2009).

## B. National Level Policies and Strategic Documents

Ecuador's *National Development Plan 2009–2013* (República del Ecuador, 2009) mentions climate change adaptation and mitigation as one of seven policies under the objective rights of nature and promotion of a healthy and sustainable environment. The policy includes the formation of adaptation programs, with particular attention given to: ecosystems; emergency prevention programs for infrastructure; adaptation initiatives related to energy and food security; vulnerability and impact assessments; and technology transfer. The plan also contains quantitative goals: by 2013, the percentage of high-risk areas in the ecosystems vulnerability index should drop to 23 per cent, and the proportion of medium-risk areas to 69 per cent.

The Ministry for Environment, through the National Climate Committee, is responsible for adaptation policy (Ministerio del Ambiente, 2011). In 2008, a draft climate change strategy was floated, but the document does not appear to have been officially adopted.

**Table 1: Key Government Policies and Reports reflecting Adaptation Needs, Priorities and Planned Actions**

Name of Policy Action		Government Division Responsible	Status	Sector(s) of Focus	Summary description
1.	First National Communication to the United Framework Convention on Climate Change	Ministry of Environment	Published in 2000	Agriculture; Forestry; Coastal zone management; Freshwater supply	Detailed vulnerability assessments along with evaluated adaptation measures are presented for a range of sectors. Further vulnerability and adaptation assessments are recommended.
3.	National Development Plan 2009-2013	National Planning Council	Published in 2009	Multi-sectoral	The development plan contains 12 key objectives, of which one relates to the environment. Under this objective, a climate change policy including key sectors for adaptation is outlined.

## C. Current Adaptation Action

In line with Ecuador's priority areas, a number of current adaptation initiatives deal with biodiversity and forests, freshwater and agriculture. To date, lesser attention has been given to the priority area of the impacts of climate change on Ecuador's coastal areas. Nor have issues such as the impacts of climate change on gender and areas such as human health, energy and human settlements been addressed. A majority of projects are focused on capacity building and policy research, but implementation of specific adaptation actions is a key component in several projects. Most of the adaptation programming in Ecuador is occurring through its participation in several regional and global projects. Several of these projects are funded by the Global Environment Facility (GEF).

**Table 2: Current Adaptation Action in Ecuador**

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)	
<b>National Action</b>								
1.	Conservation and Sustainable Management of the Natural and Cultural Heritage of the Yasuní Biosphere Reserve <sup>171</sup>	Support conservation and sustainable management of the Yasuní Biosphere Reserve, in the context of which the development of climate change responses and access to finance will be improved.	Spain, through the MDG Achievement Fund  <i>Budget: US\$4 million</i>	UNDP, government	Capacity building; Policy formation and integration	2008–2010	Biodiversity; Forestry	Yasuní Biosphere Reserve
2.	Adaptation to Climate Change through Effective Water Governance (PACC Ecuador) <sup>172</sup>	Reduce Ecuador’s vulnerability to climate change through efficient water use. Among the expected results are: integration of climate change into key plans and programs of the water sector; implement strategies and measures that facilitate climate adaptation in the water sector; strengthen institutional and human capacities.	Special Climate Change Fund, UNDP, Government	Ministry of Environment	Policy formation and integration; Capacity building	2008 - ?	Freshwater supply	Key national watersheds,
3.	Watershed Conservation <sup>173</sup>	Protect water sources in the high grasslands through integrated management that takes into account climate change adaptation. The project will create financial mechanisms for water protection and biodiversity conservation that address deforestation in important ecosystems and ensure future water availability.	United States  <i>Budget: US\$585,000</i>		Field implementation	[2010] - ?	Watershed management	High grasslands
4.	Enhancing Resilience of Communities to the Adverse Effects of Climate	Reduce vulnerability and food insecurity of communities and ecosystems, related to the adverse effects of climate change, in the most	Adaptation Fund	World Food Programme	Capacity building; Community-	2011–2016	Agriculture	Pichincha Province and Jubones

<sup>171</sup> MDG Fund, <http://www.mdgfund.org/program/conservationandsustainablemanagementnaturalandculturalheritageyasun%C3%ADbiospherereserve>

<sup>172</sup> GEF, <http://gefonline.org/projectDetailsSQL.cfm?projID=2931>

<sup>173</sup> USDS, <http://www.state.gov/documents/organization/164675.pdf>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Change on Food Security, in Pichincha Province and the Jubones River Basin <sup>174</sup>	vulnerable cantons of Pichincha Province and the basin of the river Jubones.	Budget: US\$7,449,468		based adaptation			River Basin
<b>Participation in Regional and Global Actions</b>							
5. Integrated and Sustainable Management of Transboundary Water Resources in the Amazon River Basin Considering Climate Variability and Change <sup>175</sup>	To strengthen, in a coordinated and coherent manner, the institutional framework for planning and executing activities for the protection and sustainable management of the water resources of the Amazon River Basin, endeavoring to realize a shared vision of sustainable development in the region based upon the protection and integrated management of transboundary water resources and adaptation to climatic changes.	GEF, co-financing  Budget: US\$ 51.5 million	UNEP, Amazon Cooperation Treaty Organization, OAS	Capacity building; Policy formation and integration	2009–2014	Watershed management	<i>Regional:</i> Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname, Venezuela
<i>In Ecuador: Further information required.</i>							
6. Design and Implementation of Pilot Climate Change Adaptation Measures in the Andean Region (PRAA Project) <sup>176</sup>	Implement measures to meet the anticipated consequences of the catastrophic glacier retreat induced by climate change through design and implementation of strategic pilot adaptation measures to address key impacts of glacier retreat, including: management plans for potable water systems in urban areas; promotion of less water consuming management practices in the agricultural sector; and measures to increase the natural water storage capacity of highland ecosystems.	SCCF, co-financing  Budget: US\$28.7 million	World Bank with Government ministries, regional organizations	Capacity building; Field implementation	2008–2012	Freshwater supply; Urban areas; Agriculture	<i>Regional:</i> Bolivia, Ecuador, Peru, Venezuela
<i>In Ecuador: Implementation of measures in the Andes.</i>							
7. Climate Change in a Living Landscape: Vulnerability	Improve regional coordination, maintain the integrity of natural ecosystems and promote	EU	WWF, national partners	Policy formation and	?–2010	Agriculture; Ecosystem	<i>Regional:</i> Eastern

<sup>174</sup> Adaptation Fund, <http://www.adaptation-fund.org/project/1328-enhancing-resilience-communities-adverse-effects-climate-change-food-security-pichincha>

<sup>175</sup> IW-LEARN, [http://iwlearn.net/iw-projects/Fsp\\_112799471058](http://iwlearn.net/iw-projects/Fsp_112799471058) and <http://www.otca.org.br/gefam/>

<sup>176</sup> ALM, <http://www.adaptationlearning.net/projects/regional-design-and-implementation-pilot-climate-change-adaptation-measures-andean-region>; and [http://www.careclimatechange.org/files/adaptation/CARE\\_PRAA\\_Summary.pdf](http://www.careclimatechange.org/files/adaptation/CARE_PRAA_Summary.pdf)

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
and Adaptation in the Eastern Cordillera Real of Colombia, Ecuador and Peru <sup>177</sup>	sustainable livelihoods through targeted action that contribute to reduce major conservation threats, including climate change and the urgent need to develop adaptation strategies.			integration		conservation	Cordillera Real linking Colombia, Ecuador and Peru
<i>In Ecuador: Research focused on several watersheds in the Eastern Cordillera Real</i>							
8. Capacity Development for Policy Makers: Addressing climate change in key sectors <sup>178</sup>	The project is a targeted capacity development initiative that supports two goals: 1. To increase national capacity to co-ordinate Ministerial views for more effective participation in the UNFCCC process; and 2. To assess investment and financial flows to address climate change for selected key sectors. As a result of this project, both the technical understanding of key climate change issues and their economic and policy implications within the context of the Convention will be enhanced.	United Nations Foundation and the Government of Switzerland, Finland, Spain and Norway.  \$6,953,413 USD	UNDP is implementing the project in partnership with the UNFCCC Secretariat, International Strategy for Disaster Reduction and the United Nations Environment Programme	Capacity building; Knowledge communication	2008–2010	Multi-sectoral	<i>Global:</i> 20 countries <sup>179</sup> including Colombia, Ecuador, Paraguay, Peru and Uruguay
<i>In Ecuador: The adaptation part is focused on forestry and food security.<sup>180</sup></i>							
9. Climate Policy 2012: Extension of the global project “Capacity Development for Policy	The UNDP Regional Bureau for Latin America and the Caribbean has expanded on the global project, “Capacity Development for Policy Makers to Address Climate Change” in the LAC	Spain, UNDP  Budget: US\$3.6	UNDP	Capacity building; Policy formation and	2009–2011	Government	<i>LAC Region:</i> Argentina, Bolivia, Brazil, Chile,

<sup>177</sup> WWF, [http://wwf.panda.org/who\\_we\\_are/wwf\\_offices/colombia/?183441/Cordillera-Real-Oriental-un-paisaje-vivo](http://wwf.panda.org/who_we_are/wwf_offices/colombia/?183441/Cordillera-Real-Oriental-un-paisaje-vivo)

<sup>178</sup> UNDP, <http://www.undpcc.org/>

<sup>179</sup> These countries are Algeria, Bangladesh, Colombia, Costa Rica, Dominican Republic, Ecuador, Gambia, Honduras, Liberia, Namibia, Nepal, Nicaragua, Niger, Paraguay, Peru, Saint Lucia, Togo, Turkmenistan and Uruguay.

<sup>180</sup> UNDP, <http://www.undpcc.org/content/ecuador-en.aspx>

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
Makers to Address Climate Change <sup>181</sup>	region to provide technical support to national policy makers and its Country Offices and strengthen capacity on budgetary issues related to the post-2012 climate regime. Activities include technical backstopping for countries that begin to consider adaptation to climate change in their National Development Plans.	million		integration			Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela
<i>In Ecuador: see description for the project “Capacity Development for Policy Makers to Address Climate Change.”</i>							
10. Climate Change Vulnerability Evaluation of Coastal and Marine Areas <sup>182</sup>	This project is part of the Ibero-American Programme on the Evaluation of Impacts, Vulnerability and Adaptation to Climate Change (PIACC) and aims to determine the impacts of climate change on the coasts of any country in Spanish and Portuguese speaking countries of Latin America and the Caribbean. It has a particular focus on the dynamics of beaches, estuaries, lagoons, deltas, cliffs and dunes, coastal erosion, flood risks and coastal infrastructure. This initiative is linked to the	Spain	ECLAC, University of Cantabria, national counterparts	Capacity building; Assessment; Knowledge communication	2009–2011	Coastal zone management	Most RIOCC countries <sup>184</sup> including: Argentina, Brazil, Chile, Colombia, Ecuador, Peru, Uruguay and Venezuela
<i>In Ecuador: Further information required.</i>							

<sup>181</sup> UNDP, [http://www.undpcc.org/content/act\\_latam-en.aspx](http://www.undpcc.org/content/act_latam-en.aspx) and [http://www.undp.org/climatechange/docs/EEG\\_Flyer\\_EN.pdf](http://www.undp.org/climatechange/docs/EEG_Flyer_EN.pdf)

<sup>182</sup> RIOCC, [http://www.lariocc.net/riocc\\_principal/es/proyectos\\_iniciativas/proy\\_marc\\_piacc.htm](http://www.lariocc.net/riocc_principal/es/proyectos_iniciativas/proy_marc_piacc.htm)

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	project “Economics of Climate Change in Central America - Phase II” <sup>183</sup> funded by IADB, U.K., Denmark, Spain, EU and Germany.						
11.	Mitigation and Adaptation to Climate Change in Sustainable Forest Management in Ibero-America <sup>185</sup>	Spain	INIA, CIFOR, CATIE, Polytechnical University of Madrid	Capacity building; Research; Knowledge communication	2009–2011	Forestry	RIOCC countries, including: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, and Venezuela
<i>In Ecuador: Further information required.</i>							
12.	Regional Program to Adaptation to Climate Change in Andes Region	German Federal Ministry for Economic Cooperation (BMZ)	GIZ, CAN, Ministries	Capacity building; Policy formation and integration	2011–2016	Agriculture	<i>Regional:</i> Bolivia, Colombia, Ecuador, Peru
<i>In Ecuador: Further information required.</i>							
13.	Review of the Economics of Climate Change in South America <sup>186</sup>	IADB, U.K., Denmark, Spain, EU, Germany	ECLAC	Assessment; Policy formation and integration	2008–2009	Coastal zone management; Government	<i>Regional:</i> Argentina, Bolivia, Brazil, Chile,

<sup>184</sup> The 21 member countries of RIOCC are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Portugal, Spain, Uruguay and Venezuela.

<sup>183</sup> See ECLAC, <http://www.eclac.org/mexico/cambioclimatico/index.html>

<sup>185</sup> Proyecto MIA, <http://www.proyectomia.com/>

<sup>186</sup> ECLAC, [http://www.eclac.org/dmaah/noticias/noticias/2/35232/samaniego\\_recc.pdf](http://www.eclac.org/dmaah/noticias/noticias/2/35232/samaniego_recc.pdf)

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	policies and leverage financial resources. In addition, this project includes a component focused on the impact of climate change in coastal areas–C3A (Cambio Climatico en las Coastas de America Latina y Caribe).						Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela
<i>In Ecuador: Further information required.</i>							
14.	Integrating Climate Change Adaptation into National Development Processes in Latin America and the Caribbean	Spain  Budget: US\$4,375,233	UNEP	Assessment; Capacity building; policy formation and integration	2010–2013	Government; Agriculture; Freshwater supply	LAC Region: Phase 1: 19 RIOCC countries <sup>187</sup>  Phase 2: 3-5 countries (Dominican Republic 1st country selected)
<i>In Ecuador: Further information required.</i>							
15.	Climate Change Impacts on Biodiversity in the Tropical Andes: Climate risk, vulnerability and decision making tools for the planning of conservation <sup>188</sup>	John D. and Catherine T. MacArthur Foundation	IAI	Research	2011–2013	Biodiversity	Regional: Bolivia, Colombia, Ecuador, Peru
<i>In Ecuador: Further information required.</i>							

<sup>187</sup> The 19 RIOCC countries are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela.

<sup>188</sup> IAI, [http://www.iai.int/index.php?option=com\\_content&view=article&id=120&Itemid=68](http://www.iai.int/index.php?option=com_content&view=article&id=120&Itemid=68)

Name	Objectives	Funder(s)	Implementing Agency(s)	Type of project	Duration	Priority Sector(s)	Geographic focus (if any)
	ecosystems to climate and land use changes in two cross-border areas: a) the Pacific slope of the Northern Andes, in the border region of Colombia and Ecuador; [and] (b) the Amazonian slope of the Central Andes, in the border region of Bolivia and Peru.”						
16.	Climate Change and Biodiversity Information in the Tropical Andes (Información de Cambio Climático y Biodiversidad para el Fomento de Políticas Públicas de Conservación y Adaptación en la Región de los Andes Tropicales) <sup>189</sup>	IADB; co-financing  Budget: US\$878,720	Centro Internacional para la Investigación del Fenómeno de El Niño	Policy formation and integration; Knowledge communication	2011 - ?	Biodiversity; Civil society	Regional: Bolivia, Colombia, Ecuador, Peru
In Ecuador: Further information required.							

#### D. Proposed Adaptation Action

A coastal zone and forests initiative funded by the United States has been identified as being developed for implementation in Ecuador.

**Table 3: Proposed Adaptation Actions in Ecuador**

Name	Objectives	Type of project	Priority Sector(s)	Geographic focus (if any)
1. Sustainable Coasts and Forests Biodiversity project	This project on sustainable coasts and forests will also provide both adaptation and mitigation benefits in Ecuador.		Coastal zones, forests	
<b>Notes:</b> Announced as part of the U.S. Department of State’s fast track financing. The project will be financed by USAID to a total amount of US\$780,000.				

<sup>189</sup> IADB, <http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=35427915>



### **E. Assessment**

The importance of adapting to climate change in Ecuador is acknowledged at the highest levels, as evidenced by the prominent reference in the current *National Development Plan 2009-2013*. Ecuador is also already addressing some of its priority needs in terms of adaptation. Several large projects aim at reducing vulnerabilities in the freshwater supply, agriculture, forestry and biodiversity sectors. Further adaptation activities are planned that will address needs related to coastal zone management, a previously unaddressed priority sector. Still missing are more specific adaptation policies and action plans at both the national and the regional and sectoral levels.

### **References:**

Ministerio del Ambiente (2000). Comunicación Nacional. República del Ecuador. Convención Marco de las Naciones Unidas. Cambio Climático. Retrieved from <http://unfccc.int/resource/docs/natc/ecunc1.pdf>

Ministerio del Ambiente (2011). Retrieved from [www.ambiente.gob.ec](http://www.ambiente.gob.ec)

República del Ecuador (2009). Plan Nacional de Desarrollo. Plan Nacional Para el Buen Vivir 2009–2013.