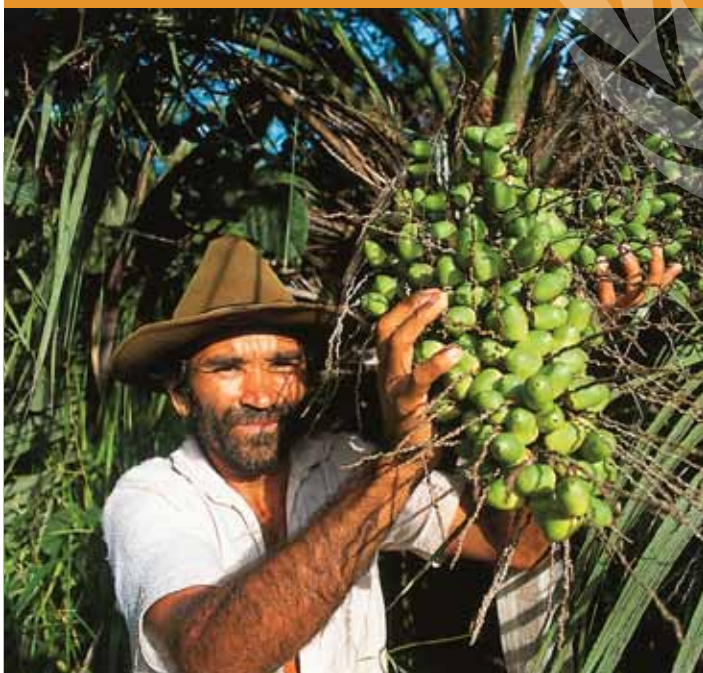


# ADAPTATION TO CLIMATE CHANGE IN COSTA RICA: AN ASSESSMENT OF NECESSARY INVESTMENT AND FINANCIAL FLOWS



[http://www.undpcc.org/en/costa\\_rica](http://www.undpcc.org/en/costa_rica)



Costa Rica's rich biodiversity is a source of both economic and environmental benefits. Photo: UNDP

→ Costa Rica is one of the biodiversity hotspots worldwide and climate change might endanger compromising the rich flora and fauna. The main adaptation measures in Costa Rica for the water and biodiversity sectors require total investment and financial flows (I&FF) of US\$ 3.4 billion (in constant 2005 US\$); of which the water sector will require US\$ 2.1 billion and the biodiversity sector US\$ 1.4 billion.

The I&FF assessment is part of the UNDP Global Project “*Capacity Development for Policy Makers to Address Climate Change*”, which seeks to strengthen national capacities in national sector planning and to improve the coordination of national policies to address climate change.

The I&FF assessment was carried out using the *UNDP Methodology for Assessing Investment and Financial Flows* (UNDP 2009), and was coordinated by an Inter-Ministerial Committee headed by the Ministry of Environment, Energy and Telecommunications (MINAET), complemented by the work of a consulting

firm. This initiative was a useful and positive experience for the Government of Costa Rica, at the political as well as at the technical level, and the Government considers this initiative important for Costa Rica to reach Carbon Neutrality in 2021.

Costa Rica is one of the 20 countries participating to the global project, among other countries in Africa, Asia and Latin America. The project is funded by the governments of Norway, Switzerland, Spain, Finland, UNDP and the United Nations Foundation.

## Selection of key sectors

The Government of Costa Rica selected to conduct this assessment on adaptation to climate change in the biodiversity and water sectors given the strategic importance of these two sectors, and because of their impacts on economic activities and conservation efforts promoted by the country to achieve sustainable development. Consultation took place at a national level during the First Inter-Ministerial Dialogue held in May 2009, where the key issues of each sector were presented and discussed, and proposed adaptation measures were defined for both sectors.

Specific selection aspects for the two sectors include:

The **water resources** sector was selected as a key sector because of its critical role for hydroelectric power generation, ensuring safe drinking water supply, importance for irrigation and drainage, to name only a few.

In terms of **biodiversity**, in recent decades Costa Rica has implemented various conservation and management actions that made the country regionally and globally a leader in environmental issues. Although some of the activities had not been introduced primarily to address climate change, they have now become the starting point of many mitigation and adaptation proposals.

### Institutional arrangements

For the assessment the institutional collaboration was established through the Deputy Minister of Environmental Management and Energy responsible for climate change issues of MINAET, who delegated the monitoring of the project to the Climate Change Directorate (DCC/MINAET). This line of communication accelerated the flow of information between different administrative bodies.

With this setup, the inter-Ministerial Support Group for consultation and validation had the role of reviewing and monitoring of the I&FF reports, which was crucial to ensure the validation of assumptions and selected adaptation measures, as well as the results. MINAET also established a Project Coordinating Committee, which was responsible for monitoring all phases of the project.

The economic, environmental and social assumptions that define the scenarios were also agreed through the inter-ministerial dialogues. Under this leadership, both UNDP and the Instituto Torcuato di Tella provided technical assistance to the national teams, based on their international experience. In Latin America, the global project has been reinforced through the UNDP regional initiative “Climate Policy 2012”.

## ASSESSMENT OF INVESTMENT AND FINANCIAL FLOWS: RESULTS IN THE DIFFERENT SECTORS

### Objectives of the I&FF assessment

The main objective of the I&FF assessment is to determine the investment and financial flows needed to address climate change at the national level. The assessment was based on previous studies, plans and strategies developed by the government of Costa Rica and attempts to answer the question: *“From a development perspective, what needs to be done in my country to address climate change in key sectors, and what financial resources are necessary to achieve that goal?”*

In this context, the national team examined the questions:

- Which are the main adaptation options for the selected sectors in the next 25 years?
- Who is investing in the sector / which are the main stakeholders and principal sources of funding?
- Which changes / increases of I&FF will be needed in the sector?
- Which will be the overall I&FF needed to address climate change in those sectors?

During the I&FF assessment, a baseline scenario and an adaptation scenario from 2005 to 2030 were created for both sectors, to determine the investment flows (IF) and financial flows (FF) needed for the adaptation measures in the key sectors. Values are given in constant 2005 US\$. The three investment entities that are analyzed are households, corporations and government. The main measures selected per sector are:

- For the biodiversity sector: Conservation of terrestrial and marine ecosystems, conservation of inland aquatic ecosystems, prevention of forest fires, and awareness raising.
- For the water sector: Hydropower production, supply of water for human consumption, irrigation and drainage, sanitation, and integrated water management.

### For the water resources sector (adaptation to climate change)

- During the period 2010-2030, investments for adaptation in the water sector should amount an estimated total of US\$ 2.1 billion (discount rate 0.1%) to balance expected climate change effects and to prevent major impacts. It was estimated that the largest



Statement of Ms. Luiza Carvalho, UNDP Resident Representative in Costa Rica: “One of the most positive outcomes of the project has been the request of the Minister of Environment of Costa Rica to UNDP to carry out I&FF assessments in 2 additional sectors: Agriculture and Transport. We have generated a useful tool for the country. Through the I&FF assessments we have created space for the strengthening of capacities. This initiative has an impact on the highest political and technical levels as well as on the national development vision. As next step, UNDP has supported the country to make an initial proposal for the institutional and financial climate architecture, and will continue to support the preparation of low carbon climate resilient development strategies in the fields of agriculture and mitigation.”

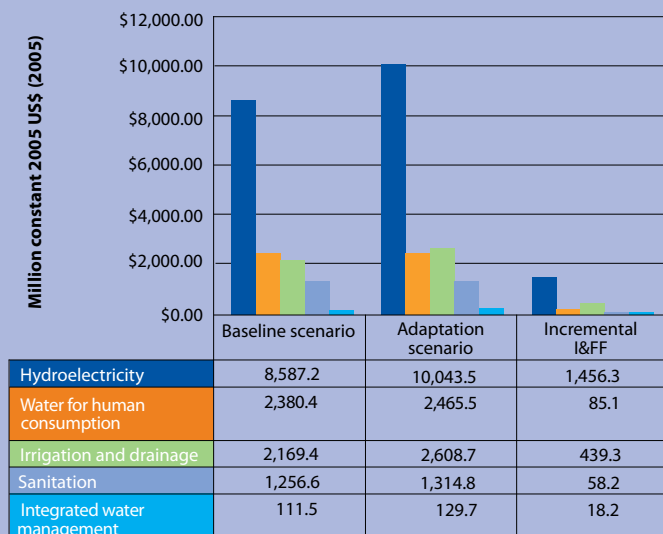


Figure. Total amounts For the baseline scenario, adaptation scenario and total incremental values for the water sector in millions of constant 2005 US\$. Period 2010-2030.

percentage of this amount will be needed by the hydropower subsector (71%).

- With regards to incremental I&FF compared to the baseline scenario, the subsector irrigation and drainage has the highest values (20%).
- A total of US\$ 1.1 billion corresponds to investment flows, US\$ 843.2 million will be needed for Operation and Maintenance, and US\$ 103.3 million for financial flows. The subsector that needs most investments is hydropower (US\$ 1 billion).

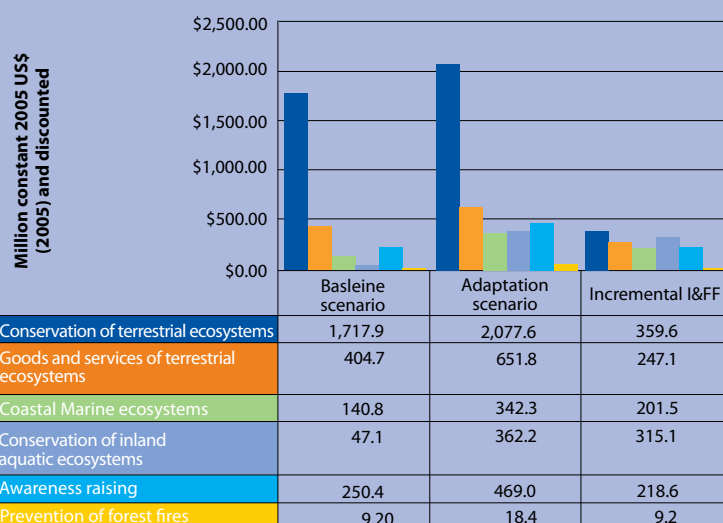


Figure. Total amounts for the baseline scenario, adaptation scenario and total incremental amounts for the biodiversity sector, in millions of constant 2005 US\$ (discounted). Period 2010-2030.

### For the biodiversity sector (adaptation to climate change)

- From 2010-2030 in the biodiversity sector a total amount of US\$ 1.4 billion (discount rate 0.1% investment flows will be necessary to avoid and alleviate the impacts of climate change.
- The financial flows amount US\$ 987.5 million, while the investment flows correspond to US\$ 363.6 million. The subsector that requires most of the investments is conservation of terrestrial ecosystems, because of the acquisition of land.

## SUMMARY TABLES OF INCREMENTAL INVESTMENT COSTS

Table 1. Cumulative discounted IF and FF for all investments in each sector, by investment entity and funding source. In million constant 2005 US\$, discount rate 0.1%, period 2010-2030.

Category of Investment Entity	Category of Investment Entity and Source of I&FF Funds	Water				Biodiversity				Both Sectors ΔTotal
		ΔIF	ΔFF	ΔO&M	ΔTotal	ΔIF	ΔFF	ΔO&M	ΔTotal	
Households	Savings and debt	-	-	-	-	-	-	-	-	-
Corporations	Corporations. National Funds. National savings (including internal cash flow)	-	-	-	-	121.53	1.96	-	123.48	123.48
	Corporations. National Funds. Domestic loans (bonds and loans)	20.45	-	8.68	29.13	-	-	-	-	29.13
	<b>TOTAL NATIONAL FUNDS</b>	<b>20.45</b>	<b>-</b>	<b>8.68</b>	<b>29.13</b>	<b>121.53</b>	<b>1.96</b>	<b>-</b>	<b>123.48</b>	<b>152.61</b>
	Corporations. External Funds. Direct foreign investment	-	-	-	-	-	247.06	-	247.06	247.06
	Corporations. External Funds. External Aid (ODA)	-	-	-	-	-	247.06	-	247.06	247.06
	<b>TOTAL EXTERNAL FUNDS</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>247.06</b>	<b>-</b>	<b>247.06</b>	<b>247.06</b>
	<b>TOTAL FUNDS OF CORPORATIONS</b>	<b>20.45</b>	<b>-</b>	<b>8.68</b>	<b>29.13</b>	<b>121.53</b>	<b>249.02</b>	<b>-</b>	<b>370.55</b>	<b>399.68</b>
Government	Government. National Funds (budgetary)	166.15	18.21	248.85	433.20	2.30	204.56	-	206.85	640.05
	<b>TOTAL NATIONAL FUNDS</b>	<b>166.15</b>	<b>18.21</b>	<b>248.85</b>	<b>433.20</b>	<b>2.30</b>	<b>204.56</b>	<b>-</b>	<b>206.85</b>	<b>640.05</b>
	Government. External Funds. Foreign loans (credits)	-	-	-	-	119.88	-	-	119.88	119.88
	Government. External Funds. Bilateral foreign Aid (bilateral ODA)	-	-	-	-	119.88	533.93	-	653.81	653.81
	<b>External financing</b>	<b>-</b>	<b>924.02</b>	<b>85.09</b>	<b>585.71</b>	<b>1594.82</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,594.82</b>
	<b>TOTAL EXTERNAL FUNDS</b>	<b>924.02</b>	<b>85.09</b>	<b>585.71</b>	<b>1,594.82</b>	<b>239.76</b>	<b>533.93</b>	<b>-</b>	<b>773.69</b>	<b>2,368.51</b>
	<b>TOTAL GOVERNMENTAL FUNDS</b>	<b>1,090.17</b>	<b>103.29</b>	<b>834.56</b>	<b>2,028.02</b>	<b>242.06</b>	<b>738.49</b>	<b>-</b>	<b>980.55</b>	<b>3,008.57</b>
<b>Total of all types of entities and sources</b>	<b>1,110.62</b>	<b>103.29</b>	<b>843.24</b>	<b>2,057.15</b>	<b>363.59</b>	<b>987.51</b>	<b>0.00</b>	<b>1,351.09</b>	<b>3,408.24</b>	

IF = Investment Flows, FF = Financial Flows, O&M = Operation & Maintenance costs  
 ΔI&FF = Incremental change of Investment and Financial Flows, ΔO&M = Incremental change of Operation & Maintenance costs  
 Source: Results of the I&FF assessment

# EVALUATION OF POLITICAL IMPLICATIONS FROM THE I&FF ASSESSMENT

## For the water sector (adaptation to climate change)

- In Costa Rica, a number of policies have been formulated that have included the issue of climate change, and these have been translated into coping strategies. Among them are the National Climate Change Strategy (2008), the National Plan of Integrated Water Resources management (2008), and the institutional strategic plans of the Costa Rican Electricity Institute (Group ICE) and the Costa Rican Institute of Aqueducts and Sewers (ICAA).
- Even though the country has a wide range of policies, it is important to strengthen the measures concerning the water sector by establishing additional policies that are

explicitly for these issues, particularly with respect to planning and research at the institutional level.

## For the biodiversity sector (adaptation to climate change)

- It is necessary to strengthen the institutional and regulatory framework regarding climate change policies to promote an adequate coordination among government agencies with the full participation of public and private actors involved in climate change management.
- It is also recommended to incorporate components of adaptation to climate change into the field of biodiversity (consolidation of SINAC, implementation GRUAS II, Land use regulations, Biological corridors, Socio-ecological units for Management for Conservation, etc).
- Long-term marine research is needed to monitor climate change and to promote dialogue between science and government officials to place this problem high on the political and economic agenda (Hoffman et al. 2009).

Table 2. Annual IF and FF for all investments in each sector. In million constant 2005 US\$, discount rate 0.1%.

Years	Water Sector				Biodiversity Sector				Both Sectors			
	ΔIF	ΔFF	ΔO&M	ΔTotal	ΔIF	ΔFF	ΔO&M	ΔTotal	ΔIF	ΔFF	ΔO&M	ΔTotal
2010	2.40	3.63	14.54	20.57	0.16	41.32	0.00	41.48	2.56	44.95	14.54	62.05
2011	2.46	3.84	14.88	21.18	10.04	42.99	0.00	53.03	12.50	46.83	14.88	74.21
2012	2.51	1.27	15.23	19.01	12.76	43.74	0.00	56.50	15.27	45.01	15.23	75.51
2013	2.57	5.72	15.58	23.87	14.13	43.96	0.00	58.09	16.70	49.68	15.58	81.96
2014	2.63	5.72	15.95	24.30	14.84	46.73	0.00	61.57	17.47	52.45	15.95	85.87
2015	9.71	1.39	16.32	27.42	15.28	46.55	0.00	61.83	24.99	47.95	16.32	89.26
2016	5.09	5.72	21.26	32.07	15.77	46.89	0.00	62.66	20.86	52.61	21.26	94.73
2017	82.01	5.72	50.19	137.92	16.31	47.23	0.00	63.54	98.32	52.95	50.19	201.46
2018	78.08	5.72	52.20	136.00	16.90	47.56	0.00	64.46	94.98	53.28	52.20	200.46
2019	78.31	3.37	50.01	131.69	17.54	47.89	0.00	65.43	95.85	51.26	50.01	197.12
2020	78.60	5.72	50.56	134.88	18.24	48.22	0.00	66.46	96.84	53.93	50.56	201.33
2021	80.15	5.72	51.04	136.91	18.99	48.54	0.00	67.53	99.14	54.26	51.04	204.44
2022	80.01	5.72	52.35	138.08	19.81	48.87	0.00	68.68	99.83	54.58	52.35	206.76
2023	81.65	5.72	52.57	139.94	20.21	49.18	0.00	69.39	101.86	54.90	52.57	209.33
2024	77.69	5.72	53.96	137.37	20.67	49.50	0.00	70.17	98.36	55.22	53.96	207.54
2025	77.70	5.72	54.33	137.75	21.21	49.81	0.00	71.02	98.91	55.53	54.33	208.77
2026	77.76	5.72	54.70	138.18	21.82	50.13	0.00	71.95	99.58	55.84	54.70	210.12
2027	77.83	5.72	55.05	138.60	22.51	50.44	0.00	72.95	100.33	56.16	55.05	211.54
2028	77.89	5.72	55.40	139.01	23.28	50.75	0.00	74.03	101.17	56.46	55.40	213.03
2029	77.95	5.72	55.76	139.43	24.14	51.05	0.00	75.19	102.10	56.77	55.76	214.63
2030	78.00	5.72	56.01	139.73	25.10	51.36	0.00	76.46	103.10	57.07	56.01	216.18
<b>TOTAL</b>	<b>1,131.00</b>	<b>105.02</b>	<b>857.89</b>	<b>2,093.91</b>	<b>369.71</b>	<b>1,002.71</b>	<b>0.00</b>	<b>1,372.42</b>	<b>1,500.72</b>	<b>1,107.69</b>	<b>857.89</b>	<b>3,466.30</b>

IF = Investment Flows, FF = Financial Flows; O&M = Operation & Maintenance costs

ΔI&FF = Incremental change of Investment and Financial Flows, ΔO&M = Incremental change of Operation & Maintenance costs

Source: Results of the I&FF assessment

**Knowledge platform** The project website [www.undpcc.org](http://www.undpcc.org) contains information about the activities in Costa Rica, the I&FF methodology, as well as numerous other resources. In Latin America, the global project has been supported through the regional UNDP initiative "Climate Policy 2012", which provided additional technical and financial support to amplify the impact of this process in the region. September 2011

## More information about the activities in Costa Rica

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