



ESTIMATED INVESTMENT NEEDED TO ADDRESS CLIMATE CHANGE IN THE DOMINICAN REPUBLIC



<http://www.undpcc.org/en/dominican-republic>

The economy of the Dominican Republic is dependent on the natural resources, changes in water availability due to climatic change can affect agricultural production. Photo: <http://www.oxfamblogs.org/lac/?p=1497>

→ Tourism and water are important contributors to GDP of the Dominican Republic, which are both affected by climate change: There is consensus among climate change forecasts that the region will see increases in temperature, sea level rise, prolonged periods of drought and an increased frequency and intensity of tropical storms and hurricanes. At the same time energy availability is the backbone of the country, which has significant potential not only for mitigating greenhouse gases, but also for savings of expenditures. According to a recently finalized assessment US\$ 4.45 billion will be needed to adapt to the impacts of climate change in the sectors tourism and water, while activities to mitigate greenhouse gas emissions in the energy sector will lead to savings of US\$ 7.10 billion.

The Dominican Republic's government chose to conduct these assessments based on the strategic importance of these sectors as well as on the impacts of economic activities and conservation efforts that drive the country to achieve sustainable development.

The assessment of investment flows and financing (I&FF) is a component of the UNDP global project "Capacity Development for Policy Makers to Address Climate Change", which seeks to strengthen national capacities for planning in the area of climate change, and improve policy coordination to address it. Dominican Republic is one of the 20 countries participating in the project. In Latin America the regional UNDP project, climate policy 2012, has provided technical and financial support for the implementation of the initiative in the region.

Selection of key sectors

For mitigation aspects the **energy** sector is of special importance, which has the largest share of emissions in the country. According to the energy balance, 80% of primary energy supply in the country is imported, almost all of it being crude oil and petroleum products, so there is potential to decrease the country's dependency on energy imports while fostering renewable energy.

Within the **water** sector it is expected that the impacts of climate change, combined with the degradation of natural resources, generate significant changes in the amount and quality of available water, as well as an increased vulnerability to extreme events, which in turn can have a major impact on the economy and the country's development. The sector is further affected by soil degradation, and inefficient water use.

The **tourism** sector is considered one of the most important sectors of national economy, it is the largest generator of employment (15% of total employees), of currency (24% of the country's income) and one of the biggest generators of foreign investment (7.7% of total direct foreign investment according to the Central Bank). Climate change affects various tourist destinations and island states as the Dominican Republic will be hardest hit in coastal marine areas according to the World Tourism Organization (WTO).

Institutional arrangements

An inter-institutional committee was established, covering the three key sectors that were analyzed, which included high-level technical representatives of key ministries, academia and the private sector of each sector: The National Council for Climate Change and Clean Development Mechanism, Ministry of Environment, Ministry of Economic Planning and Development, National Statistical Office, the Ministry of Industry and Trade as well as representatives of universities.

For the Energy sector also institutions of specific relevance to the industry attended, like the Coordinating Agency of the National Interconnected Electric System, the Dominican Corporation of State Electrical Companies, the Hydro Generation Company, the Regulation Authority of Electricity and the Office for the Reorganization of Transportation.

For the Water and Tourism sectors representatives of the Association of Hotels and Restaurants, the Ministry of Tourism, the Ministry of Agriculture, the Water and Sewerage Corporation, the National Institute of Water Resources, and other relevant institutions were involved.

ASSESSMENT OF INVESTMENT AND FINANCIAL FLOWS

Objectives of the Investment and Financial Flows Assessment

The overall objective of the I&FF assessment is to determine the extent and sources of funds needed to address climate change at the national level, and builds directly on national government strategies, plans and programmes. In essence, the assessment seeks to answer the question: *“From a development perspective, what can my country do to address climate change in selected key sectors, and what level of financial contributions will be needed to achieve these objectives?”*

In this context, the I&FF team examined the questions:

- What are the main adaptation / mitigation measures for the selected sectors in the next 25 years?
- Who is investing in the sector / Who are the main stakeholders and sources?
- What changes / increase in I&FF will be needed in the sectors?
- What additional I&FF are needed to address climate change?

For each sector a baseline scenario and an adaptation / mitigation scenario was developed, to determine the investment flows (IF) and financial flows (FF) as well as the operation and maintenance costs (O&M) of the analyzed measures between 2006-2030. The values are given in constant 2005 US\$ (1US\$ = 38.8DOP). The analyzed investment entities are: households, corporations (private and NGOs), as well as the government (public funds).

For the Energy sector (mitigation of greenhouse gas emissions)

For mitigation in the energy sector, two subsectors were considered: Electricity, which makes up a major share of energy consumed - and transport, which accounts for 31% of energy use. During the period 2006-2030, there will be savings of US\$ 7.10 billion. The main measures selected were:

“The results obtained during the process of preparing the I&FF assessments in the sectors water, tourism and energy in the Dominican Republic have identified priority measures to be implemented in national policies to mitigate climate change (energy sector) and to adapt to its impacts (water and tourism sector), and the assessment provided estimates for the future what investments will be needed to address it. It is a useful and important tool, thanks to our government team under the leadership of President Leonel Fernández, in the pursuit of economic development that is compatible with climate change”
Omar Ramírez Tejada, Executive Vice-President, National Council for Climate Change and the Clean Development Mechanism.

- For the electricity subsector, selected mitigation measures are divided into 2 fields of action: Introduction of new capacities of renewable energy and thermal energy with improved efficiency; using less carbon-intensive fuels - leading to a reduction of 114 million tons of CO₂, requiring investments of US\$ 5.82 billion, while operation & maintenance costs will then generate savings of US\$ 16.12 billion (a net saving of US\$ 10.30 billion);
- For the transport subsector, there are 2 fields of action: Introduction of an improved fuel mix as well as fostering less carbon intensive fuels - leading to a reduction of 6 million tons of CO₂, requiring investments of US\$8.85 billion, while in operation & maintenance costs will generate savings of US\$ 5.66 billion (US\$ 3.19 billion).

Out of this, corporations will cover US\$ 7.58 billion and governments will need investments of US\$ 7.09 billion, while savings in operation and maintenance costs of US\$ 21.77 billion will be reached, leading to a total saving of I&FF for government of US\$14.68 billion.

For the Water sector (adaptation to the impacts of climate change)

During the period 2011-2030, the sector will invest approx. US\$ 2.79 billion. The main measures selected were:

- Water and sanitation: Reverse the loss of quality of water bodies in the country, increasing the coverage of wastewater treatment from domestic, industrial and agriculture sources; establish a tariff system based on the management of water use (US\$ 1.30 billion);
- Integrated water and irrigation management: Integrated water resources management under the demand of multiple users (US\$ 1.00 billion);

- Environmental Management: Protection and conservation of environmental services of forests and aquatic ecosystems with an ecosystem approach (US\$ 490.55 million).

Under the reforms in the tariff system and under the improvement of the overall performance of the sector, 43.32% payment would be covered by water department, 31.67% from central government transfers, 6.21% by official development assistance (bilateral and multilateral) and 18.80% by foreign loans.

For the Tourism sector (adaptation to the impacts of climate change)

During the 2007-2030 period, the sector will invest an estimated US\$ 1.66 billion. The main measures selected were:

- Infrastructure and techniques for coastal resource protection, institutional arrangements and an incentive system to encourage the improvements, research and

social awareness, promotion of sustainable management and risk management (US\$ 1.66 billion).

The investment flows for restoring beaches are 100% made by the government, financial flows for awareness and education are covered 50% by corporations and 50% by governments while operation and maintenance costs for increased insurance cost are born by 100% corporations.

EVALUATION OF POLICY IMPLICATIONS FROM THE I&FF ASSESSMENT

For the Energy sector (mitigation of greenhouse gas emissions)

- It is possible to utilize the benefits of emission reductions to attract and catalyse financial resources, which can be in turn used for the implementation of

SUMMARY TABLES OF INCREMENTAL INVESTMENT COSTS

Table 1. Incremental discounted I&FF and O&M for all investments in each sector, by investment entity and funding source. Incremental cumulative sectoral investments, with a discount rate of 5% (million 2005 US\$). Period 2006-2030

Investment category	Sources of I&FF		Energy				Water				Tourism			
			ΔIF	ΔFF	ΔO&M	ΔTotal	ΔIF	ΔFF	ΔO&M	ΔTotal	ΔIF	ΔFF	ΔO&M	ΔTotal
Household	National	Savings and debt	-	-	-	-	283.9	423.2	417.0	1,124.1	-	-	-	-
	Total: household funds		-	-	-	-	283.9	423.2	417.0	1,124.1	-	-	-	-
Corporations	National	Domestic assets (including internal cash flow)	53.0	63.5	-	116.5	-	-	-	-	-	179.1	700.6	879.7
		Domestic debt (bonds and loans)	212.0	265.7	-	477.6	-	-	-	-	-	-	-	-
		Total: domestic sources	265.0	329.2	-	594.2	-	-	-	-	-	179.1	700.6	879.7
	Foreign	Foreign Direct Investment (FDI)	4,330.9	76.0	-	4,406.9	-	-	-	-	-	-	-	-
		Foreign loans	1,059.9	187.5	-	1,247.4	-	-	-	-	-	-	-	-
		External assistance (ODA)	973.0	359.4	-	1,332.4	-	-	-	-	-	-	-	-
		Total: foreign sources	6,363.8	623.0	-	6,986.8	-	-	-	-	-	-	-	-
	Total: corporation funds		6,628.8	952.2	-	7,580.9	-	-	-	-	-	179.1	700.6	879.7
Governments	National	Domestic funds (budget)	-	61.5	-21,774.3	-21,712.8	244.7	364.9	359.5	969.1	599.6	179.1	-	778.7
		Total: National sources	-	61.5	-21,774.3	-21,712.8	244.7	364.9	359.5	969.1	599.6	179.1	-	778.7
	Foreign	Foreign loans	1,238.0	57.3	-	1,295.3	129.0	192.3	189.4	510.6	-	-	-	-
		Bilateral foreign aid (bilateral ODA)	159.0	273.0	-	431.9	-	-	-	-	-	-	-	-
		Multilateral foreign aid (ODA multilateral)	4,354.4	948.0	-	5,302.4	47.6	71.0	70.0	188.7	-	-	-	-
		Total: foreign sources	5,751.4	1,278.3	-	7,029.6	176.6	263.3	259.4	699.3	-	-	-	-
	Total: government funds		5,751.4	1,339.7	-21,774.3	-14,683.2	421.3	628.2	618.9	1,668.5	599.6	179.1	-	778.7
Total			12,380.1	2,291.9	-21,774.3	-7,102.3	705.2	1,051.5	1,035.9	2,792.5	599.6	358.3	700.6	1,658.5

IF = Investment Flows, FF = Financial Flows, O&M = Operation and Maintenance costs
ΔI&FF = Change in Investment and Financial Flows; ΔO&M = Change in Operation and Maintenance costs
Negative values mean net savings.
Source: National I&FF assessments

mitigation measures.

- It is necessary to identify and remove structural barriers to promote the participation of public and private sectors in adaptation activities.
- It is important to strengthen the coordination of different agencies/mechanisms active in mitigation and to actually implement existing projects and initiatives that are already in place.

For the Water sector (adaptation to the impacts of climate change)

- A concerted effort is needed between institutional actors, the private sector and civil society. The legal and institutional framework reform for water management must be implemented.
- To ensure that the reform the tariff system does not

generate social tension, society must be involved and must be shown that these reforms are aimed at the sustainable management of water resources.

For the Tourism sector (adaptation to the impacts of climate change)

- The elaboration of a Land Use Master Plan is agreed. Strengthen and enforce environmental regulations, including the Strategic Environmental Assessment which includes climate change adaptation.
- Diversify products and markets: Promote alternative tourism segments to beach tourism: gastronomic, sportive, cultural, health.
- Promote capacity building and education programs incorporating environmental variables and adaptation to climate change.

Table 2. Annual incremental Investment and financial flows for all investments in each sector. In missions of constant 2005 US\$ with a discount rate of 5%. Period 2006-2030.

Year	Energy			Water			Tourism		
	ΔIF	ΔFF	ΔO&M	ΔIF	ΔFF	ΔO&M	ΔIF	ΔFF	ΔO&M
2006	175.6	43.1	84.1	-	-	-	-	-	-
2007	157.2	41.5	160.0	-	-	-	16.2	-	-
2008	421.5	39.5	225.8	-	-	-	-	-	-
2009	124.1	39.3	295.1	-	-	-	-	-	-
2010	241.8	42.3	388.6	-	-	-	-	-	-
2011	-103.3	24.4	475.5	47.0	61.1	68.4	19.3	11.8	0.7
2012	1,124.4	43.6	114.4	47.0	61.1	68.4	20.1	12.3	3.2
2013	274.4	51.6	29.6	39.8	57.0	59.2	20.9	12.8	7.9
2014	-413.6	53.9	181.4	39.8	57.0	59.2	21.8	13.3	15.9
2015	208.6	63.1	291.5	34.0	52.2	50.4	22.7	13.9	26.8
2016	-945.2	60.1	-137.8	34.0	52.2	50.4	23.6	14.5	27.5
2017	-1,049.3	60.0	-632.0	31.0	50.0	46.2	24.6	15.1	29.5
2018	-1,129.8	59.2	-1,199.9	31.0	50.0	46.2	25.6	15.7	31.7
2019	-1,191.7	53.3	-1,896.4	33.1	50.7	48.5	26.7	16.4	33.5
2020	-31.6	84.1	-2,089.6	33.1	50.7	48.5	27.8	17.1	35.4
2021	1,740.5	184.5	-1,127.2	29.1	48.4	43.3	29.0	17.8	37.8
2022	1,812.6	182.9	-1,285.6	29.1	48.4	43.3	30.2	18.5	40.5
2023	1,874.1	181.2	-1,446.1	34.4	51.5	50.2	31.4	19.3	43.4
2024	1,935.4	179.4	-1,608.4	34.4	51.5	50.2	32.7	20.1	46.3
2025	2,009.5	177.9	-1,774.2	34.9	51.8	50.9	34.1	21.0	49.7
2026	848.4	99.9	-2,101.2	34.9	51.8	50.9	35.5	21.8	51.5
2027	938.3	112.2	-2,128.6	37.8	53.4	54.6	37.0	22.8	53.1
2028	1,026.1	124.9	-2,160.2	37.8	53.4	54.6	38.5	23.7	53.9
2029	1,112.2	138.0	-2,196.2	31.5	49.8	46.4	40.1	24.7	55.2
2030	1,209.9	152.0	-2,237.0	31.5	49.8	46.4	41.8	25.7	57.1
Total	12,380.1	2,291.9	-21,774.3	705.2	1,051.5	1,035.9	599.6	358.3	700.6



Knowledge platform
The project website www.undpcc.org contains information on the activities of the Dominican Republic, UNDP's I&FF methodology, and other resources.

IF = Investment Flows, FF = Financial Flows,
O&M = Operation and Maintenance costs
ΔI&FF = Change in Investment and Financial Flows;
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Negative values mean net savings.
Source: National I&FF assessments

More information on activities in the Dominican Republic

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