



## Adaptation of Nicaragua Water Supplies to Climate Change (P127088)

LATIN AMERICA AND CARIBBEAN | Nicaragua | Environment & Natural Resources Global Practice |  
Global Environment Project | Technical Assistance Loan | FY 2013 | Seq No: 7 | ARCHIVED on 31-Dec-2015 | ISR20765 |

Implementing Agencies:

### Key Dates

#### Key Project Dates

Bank Approval Date:13-Nov-2012

Effectiveness Date:29-Jan-2013

Planned Mid Term Review Date:20-Jul-2015

Actual Mid-Term Review Date:21-Jul-2015

Original Closing Date:30-Jun-2018

Revised Closing Date:30-Jun-2018

### Global Environmental Objectives

Global Environmental Objective (from Project Appraisal Document)

The Development Objective of the Project is to enhance climate resilience of investments made in Nicaragua's rural water supply sector in order to cope with: (i) increasing climate variability; (ii) expected adverse impacts of climate change in selected areas.

Has the Global Environmental Objective been changed since Board Approval of the Project Objective?

No

### Components

Name

Pilot adaptation initiatives to enhance climate resilience in the selected municipalities:(Cost \$3.60 M)

Coast wetland protection and reduction of vulnerability to sea level rise in the municipality of Corn Island:(Cost \$0.90 M)

Institutional strengthening, project management and monitoring:(Cost \$1.50 M)

### Overall Ratings

Name	Previous Rating	Current Rating
Progress towards achievement of GEO	● Moderately Satisfactory	● Moderately Unsatisfactory
Overall Implementation Progress (IP)	● Moderately Satisfactory	● Moderately Satisfactory
Overall Risk Rating	● Moderate	● Moderate

### Implementation Status and Key Decisions



This ISR covers the project implementation status from July 2015 to December 2015, including its Mid-Term Review (MTR) mission conducted in July and a follow-up technical mission conducted in November. Closing the third year of implementation, all key activities are well on the way. During the first years of implementation, the project delivered the necessary studies to select the beneficiary communities: In 2013, Water Sources' Risk Analysis in the four beneficiary Pacific Municipalities of San Ramon, San Juan de Limay, Murra and Juigalpa, as well as Social Diagnosis and Evaluation of Drinking Water Infrastructure in the shortlisted communities within the same. In 2014, a Wetlands Protection Program for Adaptation to Climate Change was completed for the Municipality of Corn Island, and Municipal Plans for Climate Change Adaptation of the four Pacific Municipalities were completed in early 2015.

The key progress per project component achieved thus far are as follows:

**Component 1 on pilot adaptation initiatives to enhance climate resilience in the selected municipalities:** Key preparatory work for the pilot water and sanitation (W&S) works has advanced as planned regarding the study on availability of water resources in the municipalities of Murra, San Juan de Limay and San Ramón since July 2015. The study is expected to be completed in February 2016. In Juigalpa, a similar study is readily available and the design of the first pilot works on more climate resilient W&S infrastructure is expected to be initiated in early 2016. A pilot program on Compensation for Environmental Services (CES) has advanced in the four Pacific Municipalities with a total of 279 participants/beneficiaries having signed a CES contract, received the initial payment, and started implementation of improved land use practices that enhance protection of water sources. The first round of field monitoring of the program results will take place in early 2016 to verify the land use changes achieved.

**Component 2 on coastal wetland protection and reduction of vulnerability in Corn Island:** Thus far, MARENA has advanced protection of the two islands' 27 wetlands that have been delimited and marked with signs announcing their name, extension and a text promoting wetlands protection. Further, pilot areas totaling almost 10 ha have been reforested with *Rizophora mangle*, red mangrove, and a collaboration agreement is being finalized with the Bluefields Indian & Caribbean University (BICU) to strengthen the reforestation pilot with a research project focused on red mangrove reforestation as a climate adaptation measure on the Caribbean Coast of Nicaragua. Further, a group of environmental promoters has been formed and trained to initiate educational and awareness raising activities focused on wetlands protection. The Environmental Assessment process for an amplified breakwater construction to protect one of the wetlands from saltwater intrusion has been successfully completed with SERENA, the regional environmental agency issuing the respective permission. The breakwater construction is expected to start by the end of March, 2016. Lastly on the MARENA-led activities on Corn Islands, a meteorological monitoring station was installed at the Corn Island airport in July, contributing to an earlier mareografical station installed by the project at the Corn Island municipal port. Regarding Subcomponent 2.2 led by FISE, a hydrological and hydrogeological study initiated in July 2015 to define/prioritize the water infrastructure investments to contribute to secure access to safe drinking water in Corn islands is being successfully finalized by the end of December. During the MTR, part of Component 2 funding was prioritized to conduct a territorial planning process to guide the islands' development with focus on climate resilience and environmental sustainability.

**Component 3 on institutional strengthening, project management and monitoring:** Work on creating a Climate Change Information Module of SiAGUA, the National Water Resources Information System, has advanced as planned since July 2015 to create environmental and climate change related indicators and develop the necessary software. MARENA is following up with the four Municipal Plans for Climate Change Adaptation developed by the project to create a monitoring system that would allow tracking and support their implementation. An awareness raising program on climate change adaptation is being implemented in the five target municipalities, with a total of 64 activities carried out so far, engaging about 9,000 people. A total of 140 people, out of which 72 (51 percent) are women, have been trained as environmental promoters and are actively expanding and maintaining such activities. These promoters will contribute to strengthening Water and Sanitation Committees' (CAPS) organization and technical capacity.

The MTR confirmed that the project objectives, design and implementation continue to be highly relevant to the country's priorities and the objectives of the World Bank's Country Partnership Strategy with Nicaragua during FY2013-2017, taken the remarkable gap in provision of rural W&S and the increasing challenges Nicaragua confronts with drought. Both increasing vulnerable communities' capacity to adapt to increasing climate variability and promoting recovery of forest cover are high on the Government agenda. Despite initial delays to get started, there are high expectations and good prospects on the project results in terms of piloting innovative approaches to build adaptive capacity through a participatory and inter-institutional approach.

The MTR process will be finalized with a proposed project restructuring to: (i) adjust the formulation of the Global Environmental Objective (GEO) to improve its measurability and clarify the project's pilot nature and scale; (ii) adjust the results framework in line with the new GEO to improve the indicators' relevance to the GEO and to overall improve the measurability of the project performance; (iii) add the National Forestry Development Fund (FONADEFO) as a collaborating agency in the project institutional arrangements to delegate the responsibility of field monitoring and payment delivery under the CES program; (iv) add the Nicaraguan Institute for Territorial Studies (INETER) as a collaborating agency in the project institutional arrangements to collaborate in and provide technical guidance on environmentally focused territorial planning with climate change considerations on Corn Island; (v) adjust the budget allocations per component and disbursement category to secure sufficient funding for prioritized project activities; and (vi) revise the estimated disbursements.



## Risks

### Systematic Operations Risk-rating Tool

Risk Category	Rating at Approval	Previous Rating	Current Rating
Political and Governance	--	● Moderate	● Moderate
Macroeconomic	--	● Low	● Low
Sector Strategies and Policies	--	● Moderate	● Moderate
Technical Design of Project or Program	--	● Substantial	● Substantial
Institutional Capacity for Implementation and Sustainability	--	● Moderate	● Moderate
Fiduciary	--	● Moderate	● Moderate
Environment and Social	--	● Low	● Low
Stakeholders	--	● Moderate	● Moderate
Other	--	--	--
Overall	--	● Moderate	● Moderate

## Results

### Global Environmental Objective Indicators

- Improved climate change adaptation capacity of rural water supply and sanitation infrastructure of the beneficiary communities in pilot areas(Number, Custom)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	0.00	0.00	0.00	4500.00
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

#### Comments

FISE is advancing with the preparatory activities for prioritizing, planning and designing civil works for improved and more climate resilient



water supply in the communities prioritized based on their vulnerability to climate change. Due to increased overall investment costs in the sector, the initial target value of this indicator is no longer compatible with the available budget for water infrastructure and will be revised in the forthcoming restructuring. The number of targeted communities has decreased from the original 15 and through an earlier reduced number of 12, down to 7. In terms of the number of beneficiaries, this translates to a revised target from the original 4,500 to 1,329.

► Adoption of land uses that improve resilience to climate change in areas that provide watersupply to rural communities(Percentage, Custom)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	0.00	0.00	0.00	40.00
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

#### Comments

The percentage to measure reflects the increase in the value of water sources protection index (%); an integral part of the CES program design. During the MTR, the formulation of the indicator in the forthcoming revised RF was revised to add clarity. It was clarified with MARENA that the initial value of the water sources protection index, against which the percentage value will be calculated on a yearly basis, will need to be calculated from the total watershed recharge area; not just from the plots that landowners included under the CES program as MARENA had done. MARENA has completed the collection of the full baseline information in the municipalities of Murra and San Juan de Limay that count with cadaster. The full baseline information from Juigalpa and San Ramón is still being collected using GIS data. The first result of the indicator will be available after the first round of monitoring and measuring of the initial results on the ground by FONADEFO, starting in 2016 immediately after the forthcoming restructuring.

► Improved community water points constructed or rehabilitated under the project(Number, Core)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	0.00	0.00	0.00	40.00
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

#### Comments

The MTR revised the application of this Bank core indicator within the restructured RF; it will reflect the seven new water sources to be constructed by the project under Subcomponent 1.1.



- Climate change adaptation mainstreamed in rural watersupply sector's development frameworks, policies and investment tools in Nicaragua at the national level(Percentage, Custom)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	8.00	38.00	38.00	90.00
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

#### Comments

This indicator addresses a total of 13 technical instruments and policies supported by the project to guide the integration of climate change in water sector policies and investment programs at the national level. The unit to measure is % of said instruments and policies developed. Beyond the baseline value that represents the national policy on water resources that was revised in 2012 to integrate climate change considerations, the current result reflects the completion of four Municipal Plans for Climate Change Adaptation (PMACC) in San Juan de Limay, Murra San Ramón and Juigalpa. The indicator formulation was revised during the MTR, including a precise list of the targeted tools.

#### Overall Comments

#### Intermediate Results Indicators

- Communities directly benefiting from the infrastructure investment component of the pilot projects in the selected areas, reducing human vulnerability to climate change (Number, Custom)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	0.00	0.00	0.00	15.00
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

#### Comments

Based on the updated cost calculations conducted during the MTR, the target value of the beneficiary communities requires a substantive decrease due to increased costs of similar works overall in the sector and beyond the standard costs as these works integrate considerations of climate change impacts. Further, the MTR concluded that the targeted works are to be integral, covering access to drinking water, sanitation and hygiene. As per the revised cost calculations, the number of the beneficiary communities is reduced from the original target of 15, and past an earlier adjusted number of 12 down to a new target of 7 communities. It was agreed during the MTR, however, that FISE and also the Bank will search for alternative funding in order to cover works in the originally planned 15 communities. FISE has initiated implementation of the work plans for the infrastructure investments. This indicator will be revised in the restructured RF, elevating an indicator on completed pilot works on more climate resilient water and sanitation at the GEO level to generate lessons learnt for replication and/or scale-up. Further, the current GEO indicator on the number of direct beneficiaries of the works will become an intermediate results indicator.



► Communities directly benefitting from Compensation for Environmental Services (CES) component of the pilot projects within the project area (Percentage, Custom)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	0.00	100.00	100.00	100.00
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

#### Comments

The current result is 100% as the project is attending all the 36 communities (app. 2,000 Ha and 279 beneficiaries) that were prioritized and selected as the CES communities based on the Municipal Plans for Climate Change Adaptation. All the beneficiaries have received the initial CES payments and technical assistance and are implementing their selected land use changes. The indicator will be replaced in the restructured RF by a Government indicator on a number of water sources that count with adaptation measures, reflecting the level of implementation of the land management plans at the farm level.

► Women's participation in the Compensation for Environmental Services (CES) component of the pilot projects within the project area (Percentage, Custom)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	0.00	29.00	29.00	35.00
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

#### Comments

29% of the CES program beneficiaries are women; the original end target set during project preparation and prior to knowing the baseline situation on female-headed households in the selected CES communities has proved too ambitious. During the MTR process, different options to adjust this indicator to a less static indicator were discussed. Field technicians of MARENA informed the Bank team that there are farms owned by men where, regardless, the wife/another female member carries out the project-related work. On the other hand, measuring who really carries out the project activities is not the same as measuring its beneficiaries. Further, in the light of the final water recourse benefits, the final benefit will be gender neutral, yet in practice, the family members in charge of carrying water to the house will benefit from decreased work load. It was concluded that measuring the gender aspects of the CES program was too complex and could not be measured by one indicator. Thus, this static indicator will be removed from the RF and, instead, all person-focused indicators will be measured aggregating gender, including the Bank core indicator on the total project beneficiaries.

► Improve protection of wetlands and water sources included in the program of water sources management to reduce vulnerability to climate change and sea level rise (Percentage, Custom)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	0.00	0.00	0.00	50.00
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

#### Comments

This indicator is meant to measure the percentage of interviewed households perceiving an improvement in protection of the water resources. Due to too high cost of conducting annual surveys, the MTR concluded to replace this indicator with a new index type of indicator that measures implementation/status of the key wetland protection measures carried out/promoted by the project.



► Establishment of a Climate (Rainfall) Monitoring System in Corn Islands and implementation of a climate change education program (Yes/No, Custom)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	--	Y	Y	Y
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

Comments

On the ground, the two planned monitoring stations, one mareografical and another meteorological have been installed and are functioning to monitor the sea level, temperature, precipitation, etc. Further, the project is collaborating with the Municipality to promote environmental and climate related education and awareness raising activities through establishment of a network of environmental promoters that focus on improving solid waste management and keeping the wetlands clean; one of the key environmental challenges on Corn Islands. During the MTR, it was decided to focus the indicator only on monitoring the functioning of the two established monitoring stations.

► Climate Change Information Module in operation within the National Water Resources Information System (Yes/No, Custom)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	--	N	N	Y
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

Comments

The result of this indicator on revamping SiAGUA to integrate climate change related information was expected to turn to Yes during the third year of project implementation; this has not been achieved due to the challenges faced in procuring the necessary technical expertise with the available funding. Two individual consultants contracted in July 2015 by FISE have advanced as planned the related indicator and software work in collaboration with FISE, ANA and MARENA to develop the Climate Change Information Module. The Module is expected to be ready by July 2016. As ANA has not yet disclosed the overall SiAGUA for public use, revising/removing/replacing this indicator was discussed during the MTR. In July 2015, ANA expected to launch SiAGUA by early October, but it still remains pending. In November, in every case, ANA voiced a strong plea to keep the indicator, so only its formulation will be slightly adjusted in the restructured RF.



► Strengthen capacity to use the National Water Resources Information System (Number, Custom)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	0.00	0.00	0.00	300.00
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

Comments

This indicator measures the number of people trained by the project in using the revamped SiAGUA. The current result remains 0 as the revamped SiAGUA is still under work.

► Education and training programs on climate change and adaptation are formulated and under implementation (Number, Custom)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	0.00	877.00	877.00	500.00
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

Comments

This indicator measures the number of people trained by the project. The current result reflects the following types of educational/training activities and respective numbers of participants: 96 participants in training workshops for environmental promoters; 98 participants in training workshops for educators; 18 participants in training workshops for water and sanitation committees; 167 participants in youth forums; 208 participants in drawing contests; and 290 participants in events presenting environmental films. During the MTR, it was decided that the project continues monitoring the number of participants in each type of educational/training activities, but the revised indicator will only focus on staff of key institutions trained on water resources and climate change.

► Direct project beneficiaries (Number, Core)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	0.00	259.00	279.00	100.00
Date	13-Nov-2012	05-Jun-2015	07-Dec-2015	30-Jun-2018

Comments

The current result of this Bank core indicator only reflects the beneficiaries of the CES program that is under full implementation. Regarding the below supplement indicator on female beneficiaries, the current result equally only reflects the female beneficiaries of the CES program. The revised results framework will include a clear criteria/definition to be used for counting the direct project beneficiaries, and the end target of only 100 beneficiaries will be revised.



#### Female beneficiaries (Percentage, Core Supplement)

	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	0.00	29.00	29.00	35.00

#### Overall Comments

The MTR process included a great effort on the overall revision and improvement of the project RF that resulted in a proposed new draft for restructuring. A further social indicator related with community-based work around the pilot works on water and sanitation and hygiene is being developed for a pilot use, but it won't be included in the official RF.

### Data on Financial Performance

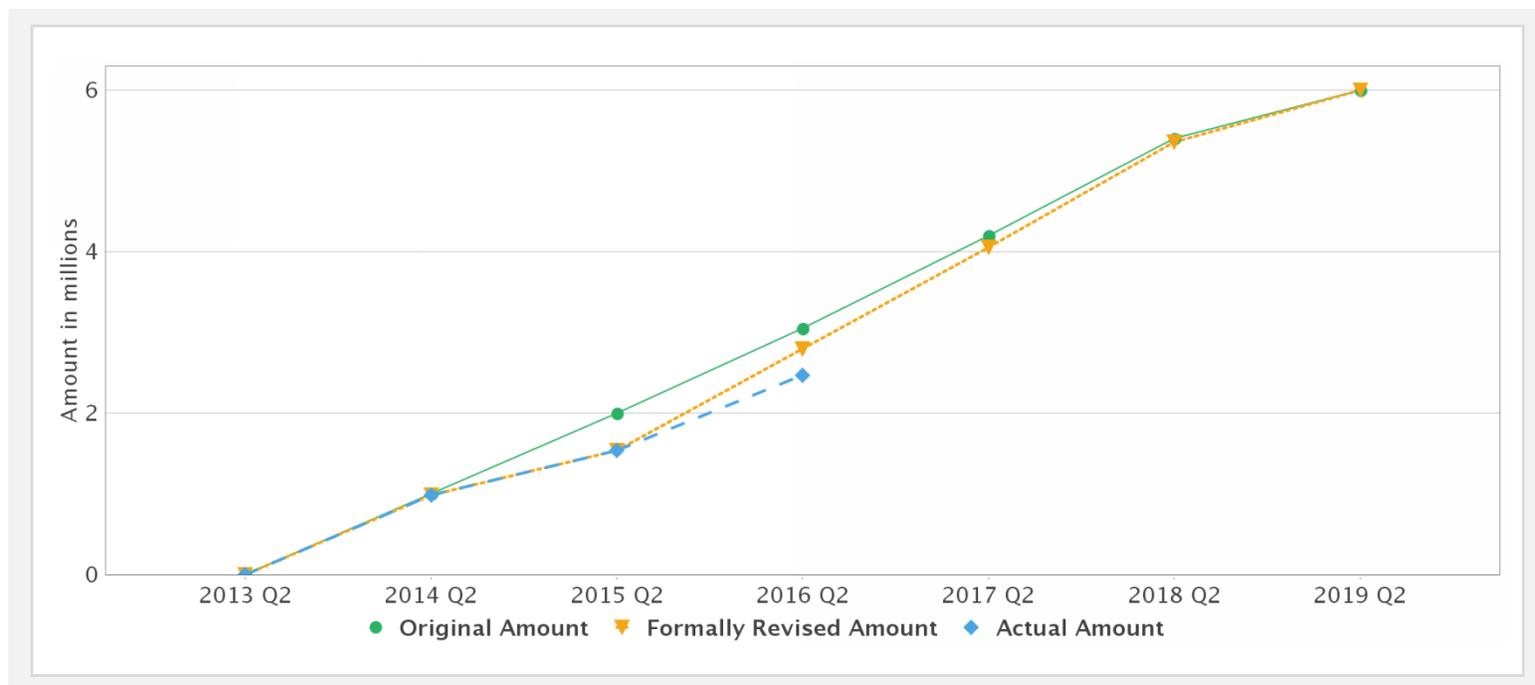
#### Disbursements (by loan)

Project	Loan/Credit/TF	Status	Currency	Original	Revised	Cancelled	Disbursed	Undisbursed	Disbursed
P127088	TF-13410	Effective	USD	6.00	6.00	0.00	2.47	3.53	 41%

#### Key Dates (by loan)

Project	Loan/Credit/TF	Status	Approval Date	Signing Date	Effectiveness Date	Orig. Closing Date	Rev. Closing Date
P127088	TF-13410	Effective	04-Dec-2012	04-Dec-2012	29-Jan-2013	30-Jun-2018	30-Jun-2018

#### Cumulative Disbursements



## Restructuring History

There has been no restructuring to date.

## Related Project(s)

There are no related projects.