

Land Mismanagement and Climate Change: The Impact on Rural Nicaragua and El Porvenir’s Response

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WATER IS LIFE

Water is life. But, across Nicaragua, rampant deforestation for cattle, agriculture, and timber extraction is resulting in less water. Streams that once flowed year round are now seasonally dry. Community wells are drying up in deforested communities in the northern and central regions of the country, leaving villagers without a source of water. The situation is dire and watershed restoration is essential to save the future of water in Nicaragua.

Watershed restoration mitigates the effects of environmental degradation and climate change while increasing food and water resiliency. It also promotes biodiversity in deforested watersheds, increases water flow in streams, preserves topsoil crucial to agricultural production, and reforests areas with native species that have been heavily deforested. We must replant, protect, and conserve the forests so that people can live, grow food, drink and use water, and raise cattle in such a way that people downstream are able to do all of those things as well.

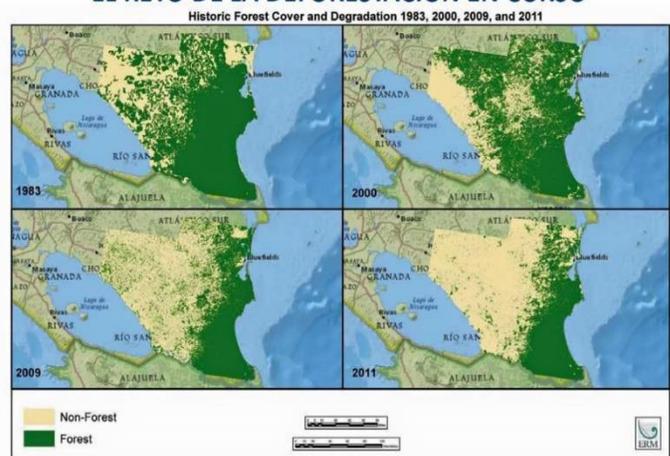


Top: Current land use.
 Bottom: Ideal land use.

NICARAGUA’S DEPLETING WATER SUPPLY

Water is becoming scarcer across Nicaragua. Follow the remaining upland streams, and you’ll end up in denuded hillsides. Over the last 70 years, the once tree-covered hills and mountains have been scraped clean of their vegetation. Now, row crops are grown on steeply sloped ground and cattle (literally called “Ganado” from the verb “ganar” meaning “to win” or “to earn”) are king, roaming wherever they please. In Waslala, Nicaragua, a third of the forest was cut down over 23 years because of logging. Cattle ranching and agriculture have taken the place of natural forests. The

EL RETO DE LA DEFORESTACIÓN EN CURSO

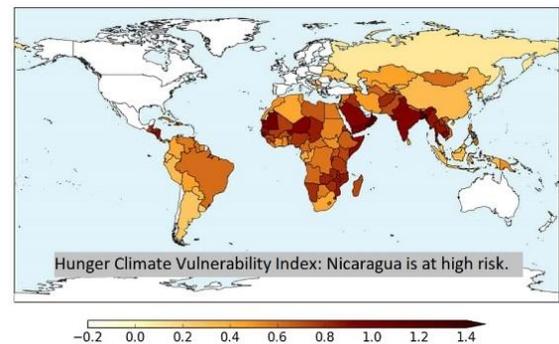


effects of this deforestation are already being felt with warmer temperatures reported and at least a 32% decrease in water flow over the last 5 years. Deforestation continues at a rate of at least 1% per year. High debt in the 1980s led to more timber and agricultural production along with lax laws in the 1990s that resulted in timber companies having greater access to forests. Laws have now changed, but enforcement is low so illegal logging and colonization¹ is rampant. It is estimated that 50% of logging is illegal. All of this plus traditional slash and burn agricultural practices have left the remaining soil thin and deficient of nutrients.

Compounding the problem is climate change. Nicaragua has been a minor contributor to global climate change yet will be significantly impacted due to location, coastal borders, and dependence on agriculture. On a global index, Nicaragua is ranked fourth most likely to suffer from extreme weather events.

General trends that can be predicted confidently due to climate change are the following:

- rising temperatures
- increasing drought in Central America (10-20% predicted reduction in rainfall)
- less stable growing conditions for crops resulting in lower yields
- increase in extreme weather events
- rising sea level, inundation of coastal communities, and the salinization of wells in coastal areas



The combined effect of watershed degradation and climate change in an area where most people are subsistence farmers put food and water security—and residents' existence—at risk.

What is El Porvenir doing to increase water and food security?

EL PORVENIR'S WATERSHED RESTORATION PROGRAM

El Porvenir's watershed restoration program seeks to conserve existing forests and restore degraded areas throughout Nicaragua in order to increase food and water resiliency.

¹ Nicaraguan colonization: Nicaragua is made up of sixteen departments (western Nicaragua) and two autonomous regions (eastern Nicaragua); there is tension between the two sides. The autonomous regions are sovereign territories with little transportation or communication infrastructure, minimal social and economic investment, and low coverage of basic services. Waslala is located in the northern autonomous region. Though the autonomous regions have sovereignty, non-indigenous people from western Nicaragua have been settling, oftentimes illegally, in the autonomous regions. When speaking of colonization, we are not referring to the Spanish or British colonization of Nicaragua, but rather colonization that is ongoing today.

To accomplish our goal of improving land use and mitigating climate change to promote water and food security, we are actively engaged in the following watershed rehabilitation practices, many of which have been used for generations:

1. Strategic reforestation where trees are integrated with livestock and crops to create a sustainable land-use system that rejuvenates damaged land while restoring stream flow, increasing rainwater absorption, and reducing soil erosion. Native grasses are used to reduce erosion, and family garden plots are established.
2. Construction of terraces and other water conservation infrastructure like check dams and seasonal retention ponds, fencing off areas being regenerated, growing grasses to feed cattle, and constructing watering troughs away from streams to protect the riparian zone.
3. Construction of vented, fuel-efficient stoves that use 60% less firewood than typical cook stoves to reduce deforestation and improve health.
4. Coordination with local government and other organizations to increase impact.
5. Educating residents on the economic and environmental benefits of climate change mitigation and watershed restoration through community workshops.
6. Creation of a model watershed that uses all of the above practices to show people from other communities how their watershed could flourish.
7. Training residents to create local community management committees who manage and maintain systems and programs. **The training and education of residents to promote behavioral change is a pivotal part of conservation, restoration, and protection.**



Multiple benefits of seasonal retention ponds: trapping the water forces absorption into hardened, degraded land AND the water stays long enough to use a simple irrigation system to grow crops like beans and corns in the dry season. This improves food security and improves farmers' income as off-season crops can be sold at a higher price.

Crucial components for success:

- Willingness of the community to create a vision and work together to achieve it.
- Incentives like tools and boots for community members to encourage participation.
- Buy-in from landowners with the most strategically important lands.

El Porvenir promotes creating a culture of conservation. Forests are reservoirs of biodiversity: critical refuges for species with numerous ecosystems that provide carbon-storage to buffer the effects of climate change. Our work educates residents and involves them in watershed restoration to promote plant and animal diversity in a way that creates a better standard of living. Making these changes now will reduce the impact of extreme weather events in the future; for example, a community with forested hillsides is much less likely to have a devastating mudslide than a deforested community. We are working with communities on risk management: building systems to resist negative impacts of heavy rain, no rain, and other weather occurrences.



Food security, especially in Nicaragua where subsistence agriculture is common, is at risk due to less stable growing conditions. Agricultural practices must adapt to warmer temperatures, reduced precipitation, less secure water supply, more extreme weather events, and more aggressive plant diseases and pests. To improve water supply and food security for future generations, we will continue to restore upland watersheds and work with villagers to implement sustainable management practices that build on traditional economic activities (agriculture and livestock) while making those practices more sustainable.

All of our projects (water, sanitation, hygiene education, and watershed restoration) begin at the community level with rural Nicaraguans asking us to work with them. The people most interested in this program are those who are noticing the effects of poor agricultural practices and climate change on their crops. Our rural partners have lived in these areas for generations; they know that weather patterns are changing, temperatures are going up, and water is becoming scarcer. What they don't know is how to reverse the effects of generations of poor land management and climate change. But they want to learn. El Porvenir's watershed program provides a critical bridge between rural communities in Nicaragua and their future sustainability.

You can support El Porvenir's work by making a donation at elporvenir.org/donate.

EL PORVENIR

Organizational History and Evolution: El Porvenir: Clean Water, Healthy Nicaraguans was founded in 1990 as a partner to Habitat for Humanity's self-help housing programs that then did not include water and bathroom facilities. What began as a response to an urgent need for clean water perceived in one Habitat for Humanity project village has grown to an organization that supports self-help, community-driven water, sanitation, hygiene education, and watershed restoration projects in 6 regions made up of hundreds of villages. El Porvenir's methodology is based on three key principles: (a) community empowerment through active participation and ownership in all aspects of the project, (b) creation of organizations in the community to manage resources in the long term, and (c) focus on appropriate technology made from low-cost locally available materials that can be easily maintained by the community. As of December 2018, El Porvenir has partnered with over 185,000 rural Nicaraguans to build 1,350 water and sanitation projects, plant over 1,200,000 trees, construct 1,800 fuel-efficient stoves, and educate all community partners on health and environmental issues.

Mission: Partner with rural Nicaraguans to develop and implement lasting projects and educational programs that increase access to clean water.