

## Will Nicaragua's Interoceanic Canal Result in an Environmental Catastrophe for Central America?

Jorge A. Huete-Perez,<sup>†,\*</sup> Jose G. Tundisi,<sup>‡</sup> and Pedro J. Alvarez<sup>†</sup>

<sup>†</sup>Academy of Sciences of Nicaragua and University of Central America, UCA, Rotonda R. Dario 150 mts Oeste, Apartado 69, Managua, Nicaragua

<sup>‡</sup>International Institute of Ecology. São Carlos, Brazil. Rua Bento Carlos 750, São Carlos, São Paulo, 13560-660 Brazil



**ABSTRACT:** Nicaragua's plan to build an interoceanic canal could be considered a major development project that would bring some economic benefit to this impoverished nation. It could also result, however, in an environmental disaster of unprecedented scope. The proposed canal—arguably the most ambitious infrastructure undertaking in Latin American history—would slice the country in half from east to west, traversing Lake Nicaragua (*Cocibolca*). The granting of such a concession without appropriate a priori environmental studies could pose a significant threat to the largest rain forest and principal fresh water reservoir in Central America. An urgent call is being made herein to the international research and public policy communities to help identify unintended consequences of great significance to environmental health, and to guide policy and approaches to avert a regional environmental disaster.

### ■ COCIBOLCA, A VITAL WATER RESERVE IN CENTRAL AMERICA

Lake *Cocibolca* (8264 sq. km) is a strategic water resource for the entire Central American region. Because of its size and its link to the Caribbean Sea via the San Juan River, it has been a pivotal factor in the socio-economic and political development of Nicaragua for millennia. This connection to the Caribbean and the short distance to the Pacific Ocean (roughly 10 km) were exploited for transportation by Cornelius Vanderbilt before the U.S. trans-continental railroad connected the east and west coasts,<sup>1</sup> and make the lake an ideal route for an interoceanic canal (Figure 1).

The lake's natural resources make weighty contributions to the national economy. The main socioeconomic activities of communities surrounding Lake *Cocibolca* are directly linked to lacustrine eco-services, including crop irrigation, fishing, livestock production and tourism. Furthermore, Lake *Cocibolca* has

enormous strategic value as the region's largest fresh water reservoir in the face of the world's changing climate and dwindling fresh water resources. Recent studies indicate that this lake may be the best source for meeting the estimated development and agricultural needs of the semiarid and highly populated Pacific slope of Central America.<sup>2</sup>

### ■ AN INTEROCEANIC CANAL THREATENS LAKE COCIBOLCA

Lake *Cocibolca* and adjacent waterways, as well as the area's rich biodiversity, are the most salient environmental concerns

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**Figure 1.** Location of proposed canal.

associated with the proposed canal. Although the final canal route is still uncertain, the most cost-effective routes being considered by project planners slice through Lake *Cocibolca*. One route favored for some time<sup>3</sup> would extend nearly 300 Km from coast to coast, and span more than 500 m in width and 28 m in depth, through an area riddled by seismically active fault lines.

The building of a mega canal through Lake *Cocibolca* has the potential to alter the biological, chemical, and physical properties of the lake, the San Juan River, and other adjacent waterways. This canal will have greater capacity than the upgraded Panama Canal, allowing the passage of vessels up to 120 000 DWT, including oil super tankers. Incidental and accidental oil spills could take decades to be remediated and would hinder the use of lake water for drinking, irrigation, and tourism. Even without oil spills, invasive species brought by ships could cause profound changes in natural populations and threaten the extinction of aquatic plants and fish, such as the cichlids that have been evolving since the lake's formation.<sup>4</sup> Canal planners will most likely also need to build a dam on the San Juan River to ensure sufficient water levels, thus restricting the river's natural flow.

Displaced terrestrial biodiversity would be confined to fragmented patches limited by the canal's infrastructure. Natural migration patterns would be altered and some species could find their spawning and rearing habitats completely destroyed. Ultimately, the degradation, wild life fragmentation and destruction of habitats may result in a loss of biodiversity. Furthermore, the canal may cross 15 protected areas listed in the Convention on Wetlands of International Importance as well as approximately 25% of the country's rainforests, possibly affecting the *Bosawas* Biosphere Reserve.

## OUTLOOK AND POLICY IMPLICATIONS

Concerned with the environmental impact that construction and operation of the interoceanic canal could cause, various sectors of Nicaraguan society have questioned the terms of this concession, which was granted without prior environmental impact assessments and instead allows for a posteriori assessments at the discretion of the concessionary. The Nicaraguan Academy of

Sciences has called for an independent and external environmental impact assessment ([http://www.cienciasdenicaragua.org/index.php?option=com\\_content&view=article&id=125:mensaje-a-la-naciondebate-construccion-del-canal-en-nicaragua](http://www.cienciasdenicaragua.org/index.php?option=com_content&view=article&id=125:mensaje-a-la-naciondebate-construccion-del-canal-en-nicaragua)). Accordingly, we propose pursuing three interconnected priority strategies:

- (1) *Constitute an independent environmental impact study committee that also considers alternative uses for Lake Cocibolca to promote economic development.* This group, consisting of world experts, would define the major concerns and potential irreversible impacts (and their significance) associated with the construction and operation of the canal. It could also explore more sustainable uses for the lake such as water supply, irrigation, and tourism. Supplying fresh water to neighboring countries could be a profitable enterprise.
- (2) *Strengthen the regulatory framework for environmental management and enforcing key regulations.* Scientific methods are used to assess and mitigate the immediate and potential future impacts of proposed large-scale infrastructure projects worldwide. Scientifically informed decision-making at all levels and adherence to international best practices in environmental responsibility are urgently needed for this proposed interoceanic canal. To protect the region's biodiversity and natural resources, it is essential to encourage broad public and private sectors participation in building a national strategy that integrates poverty alleviation and economic growth with biodiversity conservation and environmental responsibility.
- (3) *Facilitate and empower science policy in Nicaragua.* There is an urgent need for better mechanisms to facilitate knowledge exchange between scientists and policymakers, along with platforms for inserting science more directly into the environmental decision-making and economic development processes.<sup>5</sup>

We appeal to the global scientific community to aid in evaluating the environmental risk and regional consequences of

the proposed canal. Organizations involved in conservation activities worldwide are being called to action to prevent the potential catastrophic destruction of the already endangered biodiversity, and marine and freshwater resources of Central America.

While it is probable that this project will be launched and that it will significantly impact biodiversity, it also seems improbable that it will be completed. The project is deemed economically unfeasible by many experts (e.g., unclear total cost and alternative maritime routes over the North Pole). Thus, it is essential that a strong response come from the international scientific community to avoid the possibility of an environmental disaster.

## ■ AUTHOR INFORMATION

### Corresponding Author

\*((J.A.H.-P.) E-mail: jorgehuete@uca-cbm.org.

### Notes

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