



Centro Humboldt

Executive Summary

Study “Social and Environmental Assessment of the Selected Route for the Construction of the Grand Interoceanic Canal through Nicaragua”

September, 2014

Presentation

Centro Alexander von Humboldt has the contribution to a sustainable environmental management as part of its priorities, reaffirming it in face of the eventual construction of an interoceanic route in Nicaragua and the related megaprojects, taking into consideration the threats arising from the potential implementation of this initiative.

Therefore, Centro Humboldt decided to conduct its own assessment of the environmental and social sustainability of the designated route by the investors, as a technical tool that warns about the potential social and environmental impacts generated by the construction and operating of this work.

We hope that our contribution is appreciated by the public national and international opinion and that both government authorities as the concessionaire, have the openness to consider our contribution as relevant elements for the formation of decision criteria, looking for the environmental sustainability of the country and of the investment itself.

During the last two years, our organization has conducted at least two environmental impact assessments: “**Environmental impact assessment caused by the construction of the Route 1856-Juan Rafael Mora Porras, in the lower part of Rio San Juan basin**” and “**Preliminary evaluative characterization of environmental sensitivity of the influence zone of Bolivar’s Supreme Dream refinery**”. Both of these documents have been used as important references for environmental impacts assessments in different circumstances.

Centro Humboldt is committed to conduct the study: **Social and environmental assessment of the selected route for the construction of the Interoceanic Grand Canal in**

Nicaragua” and to communicate its conclusions based in scientific and technical criteria, social responsibility and promotion and protection of country’s environmental attributes.

Introduction

The eventual construction of the Interoceanic Grand Canal in Nicaragua and the related projects is the biggest threat to the environmental conditions of the country in its history and could lead to greater risk to the Nicaraguan population to not meet their basic needs for safe water and food.

Never before in Nicaragua’s recent history had been given so much impetus to the canal initiative by a government, what motivates assess the real possibility that some projects of the concession are concretized, including the construction of the wet canal despite the skepticism about the financial and environmental viability of these.

Natural resources potentially committed in the construction and operation of the works of the concession, particularly of the canal, could put the environmental conditions of the country under strong pressure leading to its deterioration and meaning a high environmental cost due the destabilization of the ecosystems that will be affected and a significant modification of the water regime of important watersheds of the country, especially the Cocibolca Lake.

The concession establish an exceptional regime that exempts all of the related projects of complying the current environmental legal framework, exposing the country to negative environmental impacts that can mean the irreversible destruction of fragile ecosystems such as: the South Pacific coral reefs, Cocibolca Lake and others that are part of the National System of Protected Areas: two Biospheres and one RAMSAR site, all of these, important elements of the national and Central American ecological stability

The concession determines that the environmental technical information generated during the design, construction and operation of the Grand Canal and its related projects will be handled in a confidential manner, precluding the Nicaraguan population to know key environmental information about the future of the country, invalidating the precept of the public nature of it and its unrestricted access as provided in the national legal framework.

Under the provision of the concession, the powers of the Nicaraguan state to exercise the regulatory and control actions in the environmental sector are substantially reduced, precluding the monitoring and follow up of the environmental compliance of the different implementers of the concession projects. This study and subsequent follow-up actions of monitoring and environmental audit that we will undertake, aim to contribute to the appropriate state management.

Goals

- ✦ To assess the environmental and social of the route foreseen for the construction of the Interoceanic Grand Canal in Nicaragua.
- ✦ To identify the degree of consistency between the proposed route and environmental standards of the country, environmental conventions and treaties signed by Nicaragua.

Background

The construction of an interoceanic route on Nicaraguan ground has been an historical constant, driven from colonial times by the groups that have held the power and linked to economically powerful foreign groups, whom the power in turn have offered permissive conditions, almost always harmful to the sovereignty of the country.

There are numerous considered routes and initiatives to build them, motivated by the existence of the Cocibolca Lake and the San Juan river, which has encouraged national and foreign interests. The most recently known study was presented in August 2006 conducted by the Work Commission of the Grand Canal, appointed by presidential decree in 1999, which can be considered as an “advanced project profile”, where 6 possible routes were identified, including those through San Juan River.

The concessionaire decided to take valuation of the 6 routes proposed in the above mentioned study. From those, 2 routes that passed through the San Juan River were rejected by the investor, given the international implications the construction of this project within a binational watershed would generate. And then, from the remaining 4 routes – without previous public comparative analysis were known, the route Brito – Las Lajas – Cocibolca Lake – Tule – Punta Gorda was nominally selected with at least 3 known variants and with no certainty at the time what is the precise route selected.

Methodology

*Study area

It was considered as a zone of influence a belt of 10 km on either side of the axis of the canal bed along the 278 km of the project length, estimating a surface of 5.523 km², of which 3.245 km² correspond to terrestrial ecosystems, 1.934 km² lake ecosystems, including 105 km of canal length within the Cocibolca Lake, and 344 km² correspond to sea platform in the Pacific Ocean and the Caribbean Sea.

Furthermore, an approximate area of 10 km radius was estimated, from the entries in both the Pacific and Caribbean. For mapping purposes, a 520 m channel width of the canal was estimated. Depending on the issue, the analysis units were: watersheds and sub-watersheds, ecosystems and municipalities.

The social and environmental valuation and assessment of the proposed route for the construction of the Interoceanic Grand Canal was developed in 3 phases: initial work office, field and final work office.

During the first phase, it was conducted the collection, revision and handling of the documents containing official cartographical and statistical information. For the analysis, social and environmental and physic-geographic variables were used, identifying relevant aspects through the use of Geographical Information System (GIS), generating digital thematic cartography by using specialized software for the management and analysis of potential scenarios.

In the field phase, site visits were made to relevant points deployed on the planned route, checking natural physical information and obtaining social information, through interviews with 203 key informants in 66 communities, in order to obtain their assessments and perspectives on the subject, the latter as part of the social baseline.

With all the information gathered and analyzed, it was possible during the last phase:

1. Site analysis according to the methodology recommended by the Center of Coordination for Prevention of Natural Disasters in Central America (CEPREDENAC) for relevant works of public investments.
2. Zoning natural multi-hazards.
3. Analysis of landscape fragmentation.
4. Balance and water sustainability.
5. Water availability simulated for year 2039 (regional climate model PRECIS).
6. Application of the official national matrix for environmental impact assessments.
7. Analysis of matrix interrelationship of the variables used.
8. Baseline for social and environmental aspects.
9. Atlas with major cartographical outputs.
10. Audiovisual material of flyby simulation with the most relevant social and environmental elements of the advertised route.

In addition to this, a legal analysis of the implications of the concession was conducted, identifying the degree of consistency between the documents legally supporting the construction and operation of this work and the national and international environmental standards in force in the country.

Legal framework of the Interoceanic Grand Canal megaproject¹

This legal study comprises three main research areas:

I. The analysis of the concession of the interoceanic canal and other megaprojects in the light of known instruments to date, defining the legal regime of exception created for this project. Anomalies in the negotiation and approval of the concession were examined; the serious implications of the provisions of Law 840 and the Master Concession and Implementation Agreement (MCA), and other instruments; in addition of the existing contradictions between the “channel” legal framework, the Constitution of Nicaragua and the environmental legislation in force in the country.

II. The revision of environmental treaties and agreements, both regional and international, signed by Nicaragua, committing the country to responsible transparent, participative and inclusive environmental management. Among others documents revised: United Nations Charter, Río+20 Declaration, Goal Nr. 7 of the Millennium’s Development Goals (MDG 7) related to environmental sustainability, the Universal Periodic Review (UPR), the Wetlands Convention (RAMSAR), the UNESCO Man and Biosphere Program, the Convention on Biological Diversity (CBD), the UN Framework on Climate Change (UNFCCC), the Basel Convention, the Universal Declaration of the Common Good of the Earth and Humanity, among others.

III. The relevance of other international environmental agreements and instruments applicable to the project according to the possible funding sources was evaluated: Performance Standards of social and environmental sustainability of the International Finance Corporation (IFC) of the World Bank Group, Ecuador Principles signed by 80 banks worldwide and Chinese regulations.

For the purposes of this summary, following assessments are highlighted:

- 1.** All anomalies, irregularities and violations of the Constitution taking place during the process of secret negotiation and expedited delivery of the concession, delegitimize the project, opening concerns about the social and environmental impacts.
- 2.** The multiple mega-concession of natural resources (water, soil, air, sea space, continental platform, etc) and (public, private and communal) properties, applicable to more of 10 sub-projects for over 100 years and throughout the country, deliberately failed due legislative process applicable to any concession of exploring and exploitation of natural resources in the country, violating the duty of consultation with the public, local authorities and indigenous peoples and Afro-descendants, established in the Statute of Autonomy, Citizen Participation Law, Law on Access to Public Information and General Environmental Law.

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3. The conditions of Law 840 and the MCA are intended to establish a legal regime of exception that evades these mega-projects to comply with national legislation. Given the legal irregularities observed in such instruments, people should advocate for the effective application of the environmental legislation in force, the international treaties signed by Nicaragua, the regional Central American agreements and the Constitution of the country.
4. The approval of the canal concession breached the obligations established in over 10 international treaties and agreements, and in more than 15 instruments of the Central American Integration System (SICA, by the acronym in Spanish) related to environmental management. This fosters the affectation of RAMSAR sites, the Mesoamerican Biological Corridor, the Biosphere Reserve of Ometepe Island, national protected areas, the omission of the free, prior and informed consent (FPIC) of indigenous peoples, among other commitments.
5. The Great Cocibolca Lake, recognized by the General National Water Law “as natural reservoir of drinking water, being of the most big interest and highest national priority for national security”, should be protected by the National State against the enormous threat represented by the canal concession.
6. The canal concession represents a serious setback in the national effort to integrate, in a comprehensive manner, the environmental considerations and the protection of nature as key elements in the decision making process of the economic, social and political stakeholders.
7. The canal concession strengthens a vision of extractive and polluting development, grounded in the logic of concentration of wealth by grabbing and privatization of common goods and the commodification of nature, creating enclaves for the benefit of foreign interests and weakening possibilities of promoting forms of sustainable development and alternatives to the dynamics of irreversible deterioration of the natural environment.
8. Internationally accepted preventive and precautionary environmental principles require that the State of Nicaragua revokes the notice of initiation of the works related to these mega-projects planned for December 2014 while not fulfill its obligation to ensure the preparation, publication and review of all technical feasibility studies, including the social and environmental impact assessments, without which the construction of this project is illegal.
9. The analysis contained in this study indicates that the concession of the interoceanic canal and related mega-projects, in the terms in which it was approved, should be rejected by the Nicaraguan people as contrary to national interests and national sovereignty.

Social and environmental valuations

***Site analysis**

The site assessment was carried out using basic information: maps of likely areas affected by natural (seismic, hydrographic, hypsographic and climatic) threats and environmentally fragile areas.

This assessment was made by semi-quantitative method and required filling histograms for 6 components and 26 environmental variables which were assessed on a scale of 1-3 each, in line with existing information from the natural physical characteristics and field verifications, being 1 the value representing the most hazardous or environmentally not compatible situations with the type of project being evaluated.

Upon evaluation of the project site, a value of 1.57 was obtained which defines it as ineligible for presenting a state of high risk that can lead to severe damages to the quality of life for people stationed in the area of direct influence of the work.

***Water sustainability**

From the hydrological point of view, the study focuses on estimating the contribution of each of the rivers located along the route, in order to make an assessment of the water requirements of the Grand Canal for its operation versus availability, using the Water Balance of Thornthwaite and Mather. The determination of the average monthly flow was implemented by a system of manager algorithm of data: Relational Database Management (RDBMS).

The study presents results obtained in the estimation of water availability in each one of the watersheds and sub-watersheds, where two scenarios are analyzed: the period 1971 to 2014 and the period 2015 to 2039. For the latter simulations have been performed estimating the potential impact of climate change on water availability, using the regional climate model PRECIS at a scale of 25x25 km.

The daily average water availability in the watershed of Punta Gorda river prior to the construction of the artificial reservoir "Atlanta Lake" is 14.7 million m³, reducing during the dry season in 74%, remaining in 3.84 million m³. For the operation of the canal, an average daily water demand of 7.46 million m³ is estimated and 8.44 million m³ in the dry season. It means that without the construction of the artificial reservoir, the water unit would not have the capability to ensure the water requirements for the optimal operation of the work.

In order to satisfy the demand, the investors are proposing the construction of the “Atlanta Lake” that would dam in an area of approximately 400 km² the rivers: Punta Gorda, Masaya, Chiquito and AguasZarcas.

For the period 2015-2039, due to climate change and according to simulations obtained with the regional model PRECIS, an average reduction of 16,6% is expected in the water availability for the operation of the canal. However, it is estimated that at the most critical year (2039), the reduction will be 31%, remaining available 8,45 million m³, matching in practice demand with availability, which could render impractical the operation of the canal in such conditions.

***Study of landscape fragmentation**

In the study of landscape fragmentation for the area of direct influence of the canal, a typology of 8 kinds of uses was analyzed, based on the land use map 2011 prepared by Ministry of Agriculture and Forestry, obtaining that 59,4% of the surface has forest cover, equivalent to 193.0 thousand ha, of which 83.386 ha correspond to tacotales (highly impacted secondary forests).

The removal of the soil cover, only the resulted due the construction of the artificial channel, will be of 8.510 ha, of which 2.340 ha are forests. This figure does not include the removal of soil for the construction of other works linked with the project: access, service roads, camps and other related projects.

Of all the species stationed on the area of influence of the project and included in the national ban system established by MARENA (January, 2014), the reptiles are 17,65% while the remaining 82,35% are mammals, of which 61,8% (21 species) are on indefinite nationwide ban.

The main species of mammals stationed in the area of direct influence, are: The tapir, jaguar, manatee, giant anteater and other species to be critically affected. In the case of the species of reptiles, at least five species of sea turtles are affected such as: Hawksbill turtle, green turtle, tora turtle, olive ridley and loggerhead turtle which will be affected in their transit routes of food supply in the seagrass of the Caribbean Sea and in its routes to their nesting beaches, in addition to the black lizard and its natural nesting areas along the rivers that will be affected by the project.

The landscape fragmentation analysis did not include the lake ecosystem of Cocibolca Lake, however by reviewing official information turns evident the existing water and biological wealth, same which will be impacted in its ecological integrity: “The Nicaragua Lake that surrounds the Ometepe island, besides being a natural reservoir of drinking water, declared of most high interest and priority for national security by the Law 620, General National Water Law, is one of the most important areas for species such as bull shark (*Carcharhinus leucas*), sawfish (*Pristis perottetti*), gar (*Atractosteus*), mojarra

(Amphylophussp), guapote (Parachromissp) and other wildlife, some of which are in danger of disappearing from the lake”².

***Impact on Protected Areas**

The advertised route for the construction of the Grand Canal passes through fragile areas that are under special protection and conservation regime, due its vast biological diversity that is threatened or in danger of disappearing. Also for providing habitat for endemic species registered in the latter years.

With the construction of this project, a direct impact on 2 of the 3 Biosphere Reserves in the country is expected: the Southeast Reserve and Ometepeisland.

The first one has a surface of 18.340 km², of which 3.465 km² are located within the area of direct impact, meaning an affectation of approximately 19% of its surface. This Biosphere Reserve is comprised of 6 conservation core areas, of which 5 are located partially within the area of direct impact of the project, among them: 3 Natural Reserves (Punta Gorda, Cerro Silva and the San Miguelito Wetlands, this last one also known as RAMSAR site; the Biological Reserve Indio – Maíz and the National Monument Archipelago Solentiname, all of them with a degree of total affectation estimated in 1,258 km².

The second one, the Ometepe Island Biosphere Reserve has a surface of 538.6 km², of which approximately 153 km² are located within the area of direct impact of this mega-project, corresponding to 28.5% of its surface, being affected 1 of its 2 Natural Reserves: Maderas Volcano in approximately 9 km².

***Environmental Impact Assessment**

In this study, the matrix for the qualitative assessment of significance of the impacts on the main social and environmental likely factors in the area of influence of the project, an instrument used by the Ministry of Environment and Natural Resources (MARENA) to evaluate projects and provide the Environmental Impact Document, when complying with the standards established in the evaluation. Among the main factors evaluated are: climate, hydrology, soil, hypsography, biodiversity, quality of life and culture, indicating the level of intensity, extent, persistence, social and economic implications and population.

After all potential environmental impacts were identified and evaluated in the matrix, an average of 70,92 was obtained, which according with the methodology would lead the competent authority to the opinion that this project generates “very significant environmental impacts” considered as ineligible to protect the environment in an appropriate manner, since according to this tool, all value exceeding 60 points has to be classified under this category. Given the margin established for a project to be considered with “some significant environmental impacts” (less than 30), it is unlikely to achieve a

reduction of its level of significance to environmental acceptable values through mitigation measures.

Following the provisions of this official instrument, the environmental feasibility of this project has to be challenged as the project: violates or is not consistent with the established in laws, decrees or Obligatory Technical Norms; violates or is not consistent with the established by international agreements or regional integration treaties signed by Nicaragua; generates significant environmental impacts and when the project generates higher risks for communities or private properties throughout the country.

***Natural threats**

The announced route for the construction of the Grand Canal passes through fragile areas that are vulnerable to the occurrence of natural geological and hydro-meteorological phenomena.

-By geological phenomena:

At national level, one of by INETER recognized seismic studies, considering the intensity of the quake (level of damage generated in the infrastructures) and not its magnitude, is the map generated by the Global Seismic Hazard Assessment Program (GSHAP), approved in the framework of the International Decade for the Natural Disasters Risk Reduction declared by the United Nations. For the analysis of seismic threats within the study, this mapping was used and led to the findings that in 48,9% of the area of influence of the project a high level of seismic threat is registered, corresponding to 2.533 km² while middle level in 50,8% (2.632 km²), and only 0,3% of the area of influence presents a lower level of seismic threat, this latter corresponding to 14 km².

-By hydro-meteorological phenomena:

Nicaragua, especially in the Autonomous Region of the Southern Caribbean, presents higher risk levels in the occurrence of extreme weather events, so in this study the map of cyclonic vortices that have affected Nicaragua during the period 1892-1996, is resumed, prepared by the Nicaraguan Institute for Terrestrial Studies. With this mapping it was possible to observe that approximately 13% of hurricanes followed a trajectory that longitudinally impacted the area of direct influence of the project.

According to the map of historic floods prepared by INETER, 6% of the area of direct influence, equivalent to 194 km², registered the occurrence of frequent and prolonged flooding.

Taking the map of hazards by droughts as reference at municipal level, prepared by INETER in 2001, 2 of the 12 municipalities that are partially located within the area of direct influence, present higher risk levels in the occurrence of this event while other 6 municipalities registered middle risk levels, all of them within the Department of Rivas.

***Social aspects**

This analysis is related to changes that may occur in both setting the territories, the system of relations of the population / involved stakeholders as in the life style and livelihoods of people and human settlements which are within the area of direct influence, as a result of externally induced change with implementation of the Grand Canal Project.

Taking cost-social benefit ratio as the main variable based on other aspects such as: individual and collective rights, property rights, human settlement patterns, rupture of social networks, jobs, productive activities, education, health and environment, which will be affected by the implementation of the works.

Tomando como variable principal la relación costo-beneficio social en función de otros aspectos, tales como: derechos individuales y colectivos, de propiedad, patrones de asentamientos humanos, ruptura de tejido social, empleos, actividades productivas, educación, salud, y ambiente, las cuales se verán afectadas por la ejecución de las obras.

According to the route announced by the concessionary, 12 municipalities will be partially within the area of direct influence of the project: El Castillo, Altagracia, Belén, Buenos Aires, San Jorge, San Juan del Sur, Bluefields, Nueva Guinea, San Miguelito, San Carlos, Rivas and Tola. From them, the last 6 will be divided by the construction of the artificial channel of the canal.

Within the area of direct influence, 282 human settlements were identified, among them, 4 local seats and 1 departmental seat, where approximately 24.100 homes are located. Based on simulations of the National Institute of Information for Development (INIDES, for the acronym in Spanish) for 2015, it is estimated that in this area in the period of the beginning of the work around 119.200 persons will inhabit, corresponding to approximately 2% of the country's total population.

Nicaragua's government, through the communal title No. 010-18-12-2009, granted to indigenous people Rama and Creoles (Afro-descendants) ancestral and communal rights on 4.053 km² terrestrial surface, of which approximately 9,5% are located within the area of direct influence of the project. If the construction of the Grand Canal is realized, this territory will be divided in two parts, 55,5% in the southern part of the canal bed and the remaining 35% in the northern part.

The first and immediate social impact derived with the enactment of Law 840 was and is the legal helplessness that results in the inability of the effective exercise of citizenship in the construction of a national project, as result of the debate of ideas, the concertation of interests and the consensus of proposals for the common good, in a platform that ensures relations of respect and equity, according to the roles corresponding to the different actors of the Nicaraguan society.

Due to lack of access to public information, the level of impact on the technical networks and social services that this concession could cause in the Nicaraguan society was not identified.

Conclusions

The canal initiative has the virtue of focusing national attention from various sectors and at all levels in the environmental risk would mean the construction of the canal and its associated projects, generating discussion spaces that demand an appropriate management of the environment, giving it the national priority it always should have had.

For operation and security reasons, this mega project will divide the country longitudinally from East to West, enclosing in an insurmountable way, an exclusion zone parallel to the axis of the artificial channel, generating important impacts in the aspects:

**Social:* Disruption of territorial tissue will occur, breaking historical neighborly relations, preventing free transit between neighboring populations, which will lead to reset it through “passageways” of which there is no information at the present time. Also, the flow of goods and services will be modified. The impacts that this division will generate on the collective imaginary of the Nicaraguan nationality is not known with precision (Northern Nicaragua – Southern Nicaragua).

Furthermore, with this concession, the violation of indigenous peoples rights to free, prior and informed consent is fostered and also restriction of the right to decide on the natural resources within their territories.

**Environmental:* There will be an interruption of free latitudinal flow of species, mainly of big terrestrial mammals, increasing the risk factors that threaten species under protection by national legal norms and international instruments.

One of the main unpredictable and determinant factors for the sustainability of the construction and operation of the Grand Canal is the impact of climate change, which, given its nature and current lower scientific certainty levels, threatens not only the sustainability of the project but of the country itself, running the risk of giving up such construction once begun, which would bring unpredictable environmental consequences.

In case this initiative is concretized, it will affect the binational watershed of the Great Lakes and San Juan River, which is considered the *spine for achieving adaptation in the face of the negative impacts of climate change*, and which provides vital elements for survival of over half of the population of the country.

In order to contribute to water and environmental safety of the project, actions need to be implemented with an approach of Integrated Management of Water Resources in the involved watersheds, aimed to ensure water availability for the optimal operation of the canal and to maintain the ecological balance of the watersheds themselves. For achieving that, the announced “reforestation” activities are not enough, considering that “reforestation” leads to forest plantations, which do not fulfill the same function of water retention of the forests. In addition, it needs to consider the timelines for these measures begin to take effect for example: the time required for the full development of planted trees.

For achieving results that contribute to the proper management of the environmental conditions, substantial changes in land use patterns in the watersheds need to be generated, mainly in the middle and upper parts of them, especially in areas that already are being used in long term activities contained in the National Human Development Plan such as: forest and agricultural monocultures and extractive industries, all of them inconsistent with the approach of integrated management of water resources.

The protection of the cultural and natural heritage is a responsibility of the Nicaraguan State, however, due the characteristics of this concession, this responsibility becomes shared with the concessionaire.

The potential construction of GCIN will test the proactive regulatory system driven by United Nations (Global Compact), international financial institutions (Ecuador Principles) and social organizations. All these instances are demanding the respect and fulfillment of human rights, environmental sustainability, transparency and accountability, and good government practices.

General recommendations

1. Given the relevance of this concession, the decision of building the project of the Grand Canal should be reviewed, consulted and looks for achieving the highest level of consensus among the Nicaraguan people.
2. Suspend the decision to initiate the implementation of the project in December 2014 while following conditions are met:
 - a. Know and thoroughly review the environmental studies according to ordinary legislation, subject to the terms set out therein.
 - b. Have negotiated access to land with the owners, in strict compliance and adherence to self-determination thereof.

- c. Reforming the Law 840 in matters relating to the rights of indigenous peoples and ethnic communities.