Public Consultation for Environmental and Social Impact

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Introduction

- The Canal will unavoidably have some negative impacts, but if ERM’s recommendations are followed, we expect a NET POSITIVE IMPACT.
- The Canal is the only realistic way of saving the remaining Nicaraguan forest and restoring degraded areas.
- Changes have been made to the original canal design to avoid and mitigate some of its negative impacts.
- The ESIA approval will require the completion of further studies before approval of the final design for construction.
- These further studies can only be completed as the final design is developed.
- The social impact of the Canal will be hugely positive with economic benefits to Nicaragua and its people.
- HKND is totally committed to ensuring that affected people are better off.
Without the Canal the ever increasing rate of forest degradation means that most of the forest will be lost within 10 to 15 years.

With the Canal people will be better off economically and there won’t be a need to clear the forest and engage in subsistence farming for livelihood. We will also start to restore the forests.
Over the past 30 years, Lago de Nicaragua watershed has lost much of its forest cover to cattle grazing and agriculture. These, coupled with the slope gradients of the watershed, has resulted in increased rates of erosion and runoff. 13.3 tons of sediment per hectare are transported to Lago de Nicaragua annually (World Bank 2013a). Increased erosion and runoff have increased Lake nutrient loadings.
Route selection for minimum E&S impact

Route 4 was found to be the only route where Net Positive Impact could be achieved.
Minimize social impact

- Route 4 requires the displacement of the least number of people;
- Affects minimum of existing social infrastructure.
Almost the only intact areas of forest remaining are the Indio Maiz and a part of the Mesoamerican Biological Corridor (Cerro Silva)
Internationally Recognized Protected Areas
Recognized Indigenous Lands
Canal alignment mostly in areas already damaged

- Canal will act as a buffer for Indio Maiz;
- Mesoamerican Corridor to be protected;
- Minimum impact on Caribbean palm forest.
10 Km Canal Corridor for ESIA

10KM wide corridor was adopted for the ESIA & design development
Improved route alignment for the ESIA

- This alignment addresses many environmental & social concerns
- Excavation quantities and cost increased as a result.
Improvements to the original scheme

- **Brito**
  - Minimize impact to the Brito Mangroves and Lagoon; preserve the mouth of the Rio Brito
  - Avoid the La Anciana Marine reserve
  - Preserve most of the Brito Beach turtle nesting beach

- **Rivas**
  - Minimize impact on the City

- **Tule**
  - Minimize impact on the San Miguelito Wetland
  - Preserve the lower reaches of the Rio Tule
  - Avoid the township of El Tule

- **Caribbean Coast**
  - Minimize impact on Mesoamerican Biological Corridor
  - Minimize impact on the Caribbean Coast Palm Forest
  - Avoid impacting the lower reaches of the Rio Punta Gorda
  - Protection Zone around Booby Cayo Marine Reserve
  - No encroachment into Indio Maiz
Lower reaches of the Rio Brito and the healthy mangroves will NOT be affected.
Significant impact on Rio Brito, Archaeological sites & Mangroves

Large portion of turtle nesting beach impacted
West Port – Inland port design

- Much reduced environmental and cultural impacts
- Reduced construction activity in ocean
West Canal Entrance – 1st relocated location

- Canal moved further to Southeast
- Reduced impact on Mangroves and month of Rio Brito
- Most beach preserved
- Impact on La Anciana Marine Reserve minimal
West Canal Entrance – 2\textsuperscript{nd} relocated location

- Canal moved a further 250 metres to Southeast (as per Expert Committee recommendation)
- Width of Canal footprint reduced
- Mangrove lagoon avoided
- Impact on Mangroves minimized
Brito will still be beautiful after Canal opens
Seismic Risk

- Rivas area is high earthquake zone
- Earthquake affects batter stability and lock safety
Brito Lock – seismic risk

- Lock location relocated to 13km inland
- Improved foundations, reduced Seismic & Tsunami risks
West Canal alignment moved at Rivas

- Entrance to Lake relocated to avoid Rivas
Rio Tule and San Miguelito Wetland

- Alignment relocated to minimize impact on San Miguelito Wetland (RAMSAR site)
- Preserves lower reaches of Rio Tule which is important for the wetland
Avoiding Rio Tule and the township of El Tule added $700 million cost
San Miguelito Wetlands currently degraded

- Currently heavily degraded
- Major restoration program agreed
Possible further alignment change to minimize impact on palm forests and avoid lower reaches of Rio Punta Gorda.
Mesoamerican Biological Corridor

- Official protected areas comprise most of MBC;
- Canal commitment to maintaining 10KM wide corridor;
- Port Aguila located offshore;
- No other development in MBC
Palm Forest

Hydraulic dredging for excavation through Palm Forest to minimize impact
Possible alignment change to reduce impact

Canal will be clear of Rio Punta Gorda until 17KM inland
Canal alignment in Caribbean

- Indio Maiz avoided completely.
- Lower reaches of Punta Gorda avoided completely

NOTE- heavy siltation of Caribbean by sediment from Rio Punta Gorda
Indio Maiz and Rio Punta Gorda are quarantined
No Encroachment into Indio Maiz

- The Canal “barrier” provides a means of protecting the Indio Maiz
- HKND and GoN to cooperate to exclude people
- The Canal does NOT encroach into Indio Maiz anywhere
Booby Cay Reserve

3KM Booby Cay “Protection Zone”
Canal water supply principle

- No net use of water from Lake Nicaragua;
- Water loses replenished with water from Rio Punta Gorda that previously ran to Caribbean;
- Agua Zarca Reservoir provides “top-up” water for El Nino events
Lake Atlanta artificially created

- Single east lock creates large inland poundage
- Studies underway to determine if impact can be reduced
Archaeological Heritage resources

- Management Plan will create huge database of pre-Columbian resources
- Significant archaeological finds during ESIA study
- HKND commitment to protection and recovery
Archaeological Heritage sites

- Important archaeological clusters at “Brito” and “El Corozo”
- Minor finds throughout area
Archaeological Heritage artifacts

Museums to preserve artifacts and other finds
Resettlement of Affected Persons

- Less than 6,800 households will be affected and approximately 27,000 people;
- 25 Indigenous households only
Resettlement Surveys

CRCC detailed survey from July to October 2014
Social and Community Buildings recorded

Church

School
Factories recorded
Infrastructures recorded
Survey Records signed

人口房屋调查表

土地调查表

企业、单位调查表

专业项目调查表
Affected People - Department of Rivas

1号用地：
面积: 2493.97hm²
人口: 139人
房屋: 6590.78m²

公路:
面积: 54.68 hm²
人口: 402人
房屋: 10700.71 m²

自贸区:
面积: 1972.41hm²
人口: 1176人
房屋: 34467.37m²

度假村:
面积: 306.49hm²
人口: 84人
房屋: 1661.72 m²

2号用地:
面积: 869.71hm²
人口: 410人
房屋: 13540.15m²

机场:
面积: 457.42 hm²
人口: 183人
房屋: 3469.67 m²

3号用地:
面积: 846.94hm²
人口: 212人
房屋: 9691.04m²

运河:
面积: 13503.29 hm²
人口: 5575人
房屋: 140461 m²
Affected People - South Atlantic Autonomous Region

- **South Atlantic Autonomous Region**
  - **用地1**
    - 户数: 77
    - 居民人数: 305
    - 面积: 1017.94 hm²
  - **运河**
    - 户数: 3421
    - 居民人数: 14505
    - 面积: 86907.15 hm²
  - **用地2**
    - 户数: 168
    - 居民人数: 889
    - 面积: 13899.55 hm²
  - **公路**
    - 户数: 59
    - 居民人数: 166
    - 面积: 372.63 hm²

加勒比海
Affected People - Indigenous Lands

- Canal will rent 26,000 Hectares of Indigenous Land
- Total of 362 household affected
- Only 25 families are Indigenous
- The other 337 families are settlers

Only 25 indigenous households affected
Government census
Informe General del levantamiento del Censo Socio Económico del Gran Canal de Nicaragua

Considero indispensable para trasladarme a otro sitio

- Tener fácil acceso a salud y educación: 61.4%
- Tener acceso a servicios básicos: 61.3%
- Que se construyan centros de salud en la nueva comunidad: 58.1%
- Que se respete nuestro patrimonio histórico y cultural: 57.9%
- Facilitación para la adquisición de tierras: 57.6%
- Que se construyan iglesias en la nueva comunidad: 57.1%
- Recibir asistencia técnica y capacitación: 54.8%
- Que mis hijos reciban becas en nuestro país: 54.2%
- Tener acceso a créditos o préstamos: 54.2%
- Tener facilidades para practicar deportes: 51.2%
- Que mis hijos reciban becas en el extranjero: 45.0%
- Trabajar en el canal: 43.9%
Land Expropriation Boundaries
Resettlement Action Plans

Resettlement Action Plan
Nicaraguan Inter-oceanic Grand Canal project & Related Sub-projects

Release date: 06 Mar 2015
Version: Draft
Resettlement villages proposed by GON
Surplus material disposal

- Over 30,000 hectares of new farmland from material disposal
- Land for land exchange option is available to affected people
Livelihood Restoration

- New agricultural industry on farmland created
- Reprocessing industries to be developed
Agricultural product reprocessing

Coffee making

Meat processing

Beverage
Training and technical support

General training

Training for women

Improve farming technique

Technical advice
Industrial employment
Shipping industry

Port and Logistics

Ship Repairs

Container Transport
Positive Environmental & Social impacts

- Indio Maiz protected from encroachment
- Improvements to MBC
- Create bird reserves on Lake Nicaragua artificial islands
- Massive reforestation program
- Archaeological heritage opportunities
- Economic growth for Nicaragua
- Improved employment opportunities for all Nicaraguans
- Improved social infrastructure “roads, health, education and facilities”
- NET IMPACT IS POSITIVE
Negative Environmental & Social impacts

- Lake Atlanta
- Risk to Lake Nicaragua
- Relocation of affected people
- Clearing of some forests
- Impacts of excavation
- Encroachment on San Miguelito Wetland
- Impact on Rio Punta Gorda
- Impacts at Brito
- Loss of farm land
Environmental offsets

- Creation of forest “corridors” with surplus excavation material
- Reforestation programs for whole Rio Punta Gorda catchment
- Reforestation to protect MBC
- Reforestation of San Miguelito wetland
- Protection of Indio Maiz from encroachment
Future studies

Studies to be completed before final design of approval and commencement of construction:

• Topography Survey
• Geotechnical & seismic risk assessment
• Acid Rock Drainage potential
• Lake Nicaragua sediment study
• Lake Nicaragua bathymetry study
• Water balance & salinity study
• Archaeological study
Further studies – Topography survey & Bathymetry

- **LiDAR survey more than 4,500 KM^2**
- **Shallow water bathymetry of Lake Nicaragua**
Stakeholder Engagement

- Improve communication with the community about project impacts and benefits
- Resettlement Action Plan communication is important
Thank You!

We are Satisfied