Document of the Inter-American Development Bank

**Haiti**

**Productive Infrastructure Program III**

**(HA-L1091/HA-X1036)**

**Economic Analysis Annex**

1. **Introduction**

This report provides an economic evaluation of the fourth operation of the Caracol Industrial Park (“PIC” as its acronym in French). The economic viability of this operation is assessed through a Cost-Benefit Analysis.

After the January 2010 earthquake, the Government of Haiti (GoH) designed a National Recovery Action Plan, primarily based on a Regional Growth Pole Strategy; in order to decrease economic and financial concentration in Port-au-Prince, the capital severally damaged by the earthquake. As part of this strategy, the Northern Region was identified as a Pole to build productive infrastructures, to develop the industrial, agricultural, agribusiness and tourism sectors and promote private sector development. The Caracol Industrial Park is the biggest infrastructure project developed within this program.

The objective of Caracol Industrial Park project is to contribute to the socioeconomic development of Northern Haiti by creating conditions for the establishment of manufacturing firms in the Caracol Industrial Park and thus generating employment opportunities for the local population. The primary benefits of the park will be quantified through the salary paid to the additional employment generated by this project. Prior to investing in the PIC, a study on the Development of the Industrial Park Model to Improve Trade was conducted by Koios. In this study, alternative locations were studied and the Northern Region of Haiti was identified as the most attractive, given (a) the vast amount of available land; (b) the proximity to the Dominican Republic and Cap-Haitien international port and airport, Haiti closest transport facilities to the United States; (c) abundant water resources; and (d) large pool of potential workers.

1. **Assumptions and Methodology**

This cost benefit analysis was conducted on the fourth investment grant operation to be financed by IDB for the Caracol Industrial Park. The alternatives considered are with or without this operation. Only the benefits and costs generated by this project are considered.

The methodology used follows the Jayanthakumaran’s (2003) framework on the Export Processing Zones (EPZs).[[1]](#footnote-1) Under this approach, the benefits and costs are calculated as follows:

* Expected benefits:
	+ The difference between wages paid to local labor (MWR) and the shadow wage (SWR);
	+ The difference between payments by foreign firms for public utilities and locally purchased inputs (LP) and the opportunity cost of these public utilities and locally purchased inputs (MSC)
	+ All tax payments by foreign firms (TAX), and
	+ Net profit income that goes to local equity shareholders in the EPZ firms (NP).
* Expected costs:
	+ Capital infrastructure cost (CAP) of the establishment of the EPZs; and
	+ Administrative expenditure for the zone operation (ADM).

Thus, an economic net benefit-cost position in any year may be expressed for year t as:

NBCt = (MWR – SWR)tL + (LP-MSC)tQ + TAXt + NPt – CAPt – ADMt

The Jayanthakumaran’s (2003) framework on the Export Processing Zones recommends evaluating this type of project in average over 20 years.

The Economic Rate of Return (ERR) and Net Present Value (NPV) are calculated as follows:

$$\sum\_{t=2015}^{2034}\frac{NBC\_{t}}{\left(1+ERR\right)^{t-2015}}=0$$

$NPV=\sum\_{t=2015}^{2034}\frac{NBC\_{t}}{\left(1+r\right)^{t-2015}}$

With r equal to the discount rate

The discount rate used for this cost benefit analysis is 12%, following the IDB standard.

1. **Economic Benefits**

According to the methodology described above, the fourth operation utilized the following economic benefits to calculate its economic viability: *Wage and shadow wage differential: :* According to the forecast of the firms actually settled in the PIC and those that have already signed contracts to settle in the PIC the fourth operation will create around 6,800 jobs by 2018. The economic benefit of employment is quantified as the difference between the minimum salary paid to PIC workers of US$5/day and the shadow cost of labor. The shadow cost of labor is estimated at US$1/day for 70% of the workers and US$2/day for the remaining. In addition, the annual value is calculated based on 284 working days per year.

* *Social Benefits paid by foreign firms to the Government of Haiti* **TAXt***:* The forth operation will finance buildings to be rented mainly to one foreign company, who currently benefits from tax holidays for corporate and import taxes. Therefore only social security benefits paid for workers were considered. This social security benefit corresponds to the contributions to ONA (3%) and OFATMA (9%).
* *Rental Income*: The rental income includes rent paid by foreign firms of b`uildings constructed with this project. In addition, the base case scenario assumes that tenants will rent the buildings for their rental agreement contractual term.
* *Payment for public utilities and services*: This benefit includes the difference between the incremental payments made by the foreign firms in the PIC for services (water, sanitation and transportation) and the opportunity cost for these services.
* BOX 1: Non quantified economic project benefits:
* *Income tax from foreign companies:* Foreign PIC tenants will benefit from at least a 15-year exemption on income taxes. Given the uncertainty on future net income generated by these companies, the future income tax payments of the foreign companies have not been quantified in this analysis.
* *Foreign direct investments:* So far, foreign tenants of the PIC have invested around US$ 85 million to set up in the park.
* *Indirect jobs:* The economic evaluation does not take into account indirect jobs. For this type of project, an average employment multiplier of 2.0 is usually expected. This means that for every jobs created at the PIC at least one job outside the PIC will be created. Therefore the fourth potential has the potential to create at least 18,540 jobs.
* *Creation and growth of local businesses:* It is expected that local workers will spend 75% of their salary in the local economy on items such as food, housing, clothes, school fees and leisure. As such, it will create opportunities for local entrepreneurs to create and/ or expand businesses to meet the new standards of living of local workers.
* *Women empowerment:* As 65% of PIC of employees are expected to be women, the PIC will contribute to their empowerment and magnify the PIC impact on the community, given that women participation in the labor force usually have a high potential for poverty rate reduction.

The table below summarizes the quantified economic benefits of the project.

**Table 1: Economic Benefits (in US$ 1.000)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Benefit** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023 and after** |
| Total jobs expected *(not included in benefits*) | 2511 | 6799 | 9270 | 9270 | 9270 | 9270 | 9270 | 9270 | 9270 |
| Net salary paid to local workers | 2639 | 7144 | 9740 | 9740 | 9740 | 9740 | 9740 | 9740 | 9740 |
| Social security paid for workers | 321 | 869 | 1184 | 1184 | 1184 | 1184 | 1184 | 1184 | 1184 |
| Differential of services paid by foreign firms and their opportunity cost  | 165 | 259 | 268 | 289 | 289 | 289 | 289 | 289 | 289 |
| Rents paid by foreign tenants | 66 | 205 | 205 | 205 | 298 | 806 | 1163 | 1163 | 1163 |
| **Total Economic Benefits (\*)** | **3,193** | **8,477** | **11,399** | **11,419** | **11,513** | **12,020** | **12,377** | **12,377** | **12,377** |
| (\*) Differences due to rounding |

1. **Economic Costs**

The fourth operation of the Caracol Industrial Park has an investment cost of US$ 70 million. The disbursement profile of this grant is shown in the below table, with the incremental operation and maintenance costs associated with the buildings financed by the fourth operation.

**Table 2: Economic Costs (in US$ 1.000)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Costs** | **2015** | **2016** | **2017 and after** |
| Component I | 21,250 | 40,750 | - |
| Component II | 2,000 | 15,000 | - |
| Component III | 500 | 500 |  |
| Program Management | 25,000 | 45,000 |  |
| Incremental O&M costs | 1,381 | 1,381 | 1,381 |
|  **CAPt** |  **26,381**  | **46,381** | **1,381** |

1. **Economic Returns**



It should be noted that the Economic Internal Rate of Return calculated on the 20-year timeline indicates an economic rate of return of 13.8%, and a Net Present Value of Net Benefits-Costs US$ 5.7 million. These figures mean that the fourth operation has the potential to provide substantial benefits.

1. **Sensitivity analysis**

The NPV and ERR can be affected by key assumptions. In order to evaluate the impact of a change in assumptions , a sensitivity analysis was conducted and the main assumptions are summarized in the below table.

|  |  |
| --- | --- |
| **CASE** | **MAIN ASSUMPTIONS** |
| **Base case** |
|   | Number of workers: Actual tenant forecast for buildings of the fourth operation |
|   | Rented area: Actual foreign tenants firmed commitments |
|   | Rent: Base rent as per rental agreement and $380/ month per room in the dormitories |
|   | Lease length: Actual tenants firmed commitments (30 years for SAE-A and 10 years for Goal Export) |
|   | Salary paid to workers: based on 284 working days per year, a minimum wage of $5/day |
|   | Social security paid to workers: 3% for ONA + 6% for OFATMA so in total 9% |
|   | Water supply charges at US$0.8 per cubic meter and sewage charge at US$0.8 per cubic meter  |
|   | O&M costs: US$ 1.381 million per year |
|   | 40% of transport cost covered by tenants |
| **Case 2: Salary Deflation** |
|   | Case 2 has the same assumption as the Base Case, except for: |
|   | Minimum salary reducing by 2% per year (Corresponding to a loss in purchasing power of workers in dollar terms) |
| **Case 3: -30% on job forecast** |
|   | Case 3 has the same assumption as the Base Case, except for: |
|   | 30% less job creation compared to the Base case |
| **Case 4: -30% on rental income** |
|   | Case 4 has the same assumption as the Base Case, except for: |
|   | Rental rate 30% lower than the base case |
| **Case 5: One-year strike** |
|   | Same as base case except for: |
|   | No revenue for workers and services for the PIC in 2017 except for rent due to a one-year strike |
| **Case 6: Goal Export Renews its Lease** |
|   | Same as base case except for: |
|   | Goal Export renews its 10-year lease for an additional 10-year. |

The below table summarizes the ERR and NPV in each case:

|  |  |  |
| --- | --- | --- |
| Case | NPV (US$ m) | EIRR |
| Base Case | 5.7 | 13.8% |
| Case 2: -2% per year on salaries | 0.4 | 12.1% |
| Case 3: -30% on job forecast | -14.5 | 7.2% |
| Case 4: -30% on rental income | 4.2 | 13.4% |
| Case 5: One-year strike in 2017 | -2.3 | 11.3% |
| Case 6: *Goal Export* company Renews Lease  | 10.7 | 15.1% |

The most important parameter is the **number of jobs created** and this parameter should be monitored carefully. The Jayanthakumaran (2003) economic model will also be applied to the project in the ex post economic evaluation.

1. **Conclusions**

The economic analysis shows that under conservative assumptions the fourth operation has the potential to generate an economic rate of return of 13.8%. Sensitivity analysis yielded similar positive results, except in two cases (a reduction in jobs of 30% and a one-year striske in 2017) - which is unlikely to occur in the medium term. All other scenarios resulted in IRR above 12%.

1. **ANNEX**

The following tables contain the calculations used in this economic analysis.

TABLE1 : Benefits and Costs Summary





1. “Benefit-Cost Appraisals of Export Processing Zones: A Survey of the Literatur” Kankesu Jayanthakumaran, Development Policy Review, 21, 2003. [↑](#footnote-ref-1)