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Benefit-Cost Analysis

Report on the
Computerization of Procedures
at the International Port of Cap-Haïtien

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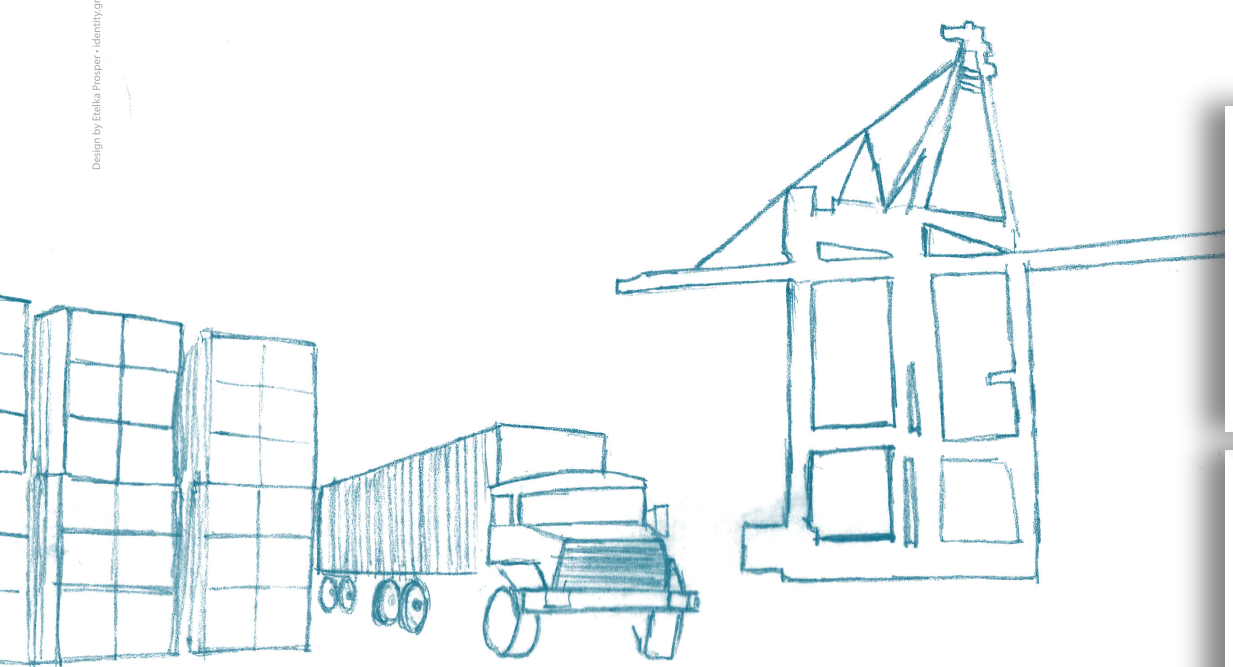

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Haïti Priorise
Un plan de développement alternatif

Report on the Computerization of Procedures at the International Port of Cap-Haïtien

Haïti Priorise

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Canada

Definition of Acronyms

AGD: Administration Générale des Douanes [General Customs Administration]

APN: Autorité Portuaire Nationale [National Port Authority]

ECA: Economic Commission for Africa

UNCTAD: United Nations Conference for Trade and Development

NICT: New Information and Communication Technologies

WTO: World Trade Organization

ONE: Oficina Nacional de Estadística (Dominican Republic)

GDP: Gross Domestic Product

LDC: Least Developed Countries

PPP: Public-Private Partnership

BCR: Benefit-Cost Ratio

SYDONIA: IT Customs System

USAID: United States Agency for International Development

Abstract

Many ports around the world are entering into an automated procedures dynamic for the benefits offered by it. Given the current economic stakes in Haiti, particularly in the north, a computer system dedicated to the port, allowing all port professionals at customs administration to exchange data and messages in complete confidentiality and security, would bring considerable productivity for port passage among other parameters.

Documentary research has shown the importance of a dematerialization of port procedures. On this basis, and taking into account the context, a benefit-cost analysis study was carried out. The benefit-cost ratio (BCR) was the alternative investment criterion. The objective of this study is to provide decision-makers with adequate instruments to target public investment in the port sector. A status report on the port situation in Haiti has oriented the effort towards the port of Cap-Haïtien.

The results of the ratios with discount rates of 3%, 5% and 12% converge toward values greater than 1. This means that the intervention concerning the automation of the procedures of the Cap-Haïtien port can be undertaken. In keeping with the prioritization of needs, the Haitian state should consider this intervention.

Policy Summary

Overview

Haiti has enormous maritime potential with more than 1,500 kilometers of coastline to its name. However, Haiti is among the Caribbean countries that exploit their marine resources the least. While the latter are seeking to bring their ports in line with international standards in order to capture the maximum of the marine market, especially with the enlargement of the Panama Canal, Haiti is still slow in making major investments in port infrastructure.

The meeting on the redevelopment of the Cap-Haïtien port held on Thursday, July 28, 2014, between the Haitian Government and the United States Agency for International Development (USAID) is breaking the trend. The meeting resulted in an agreement to renovate the Cap-Haïtien port via a project financed at nearly US $65 million. The latter aims to increase the competitiveness of port services in the north by improving infrastructure and customs operations.

The project, through its three components—the construction of a container terminal, the completion of security works and the recruitment of a private operator for the operation of the container terminal as part of a public-private partnership (PPP)—does not address the automation of Cap-Haïtien port services. So, we became interested.

In the port services of the Cap-Haïtien port, there is a bureaucratic slowness linked to a lack of automation of services. As a result, due to the lack of a mirror server installation at the Cap-Haïtien port, communication between the Cap-Haïtien port and that of Port-au-Prince via the computerized customs system called SYDONIA is frequently interrupted. This implies a delay in the control of slips and in the payment of these slips. With the non-existence of computer backup, the mirror does not take over and does not allow the operation of the SYDONIA in Cap-Haïtien with a rupture of operations in Port-au-Prince.

In addition, the control of goods is done in a traditional way. This makes verification of goods a long process.

The various actors in the logistics chain of the Cap-Haïtien port tend to have, in an isolated way, their own computer systems for tracking goods without a real interconnection, whereas a single electronic port portal would allow all parties involved in the process to be linked by an interface and to be able to follow goods in real time.

Proposed Intervention

The state of affairs has led us to consider the implementation of an intervention concerning the computerization of procedures at the international Cap-Haïtien port. The latter must be achieved by strengthening the logistics chain capacities of the Cap-Haïtien port through highly advanced information exchange platforms within the port communities, making high value-added logistics services effective, which get ready to develop:

a) **A single electronic port portal** with a computer platform that integrates all actors in the supply chain with a common database. It will simplify and unify all the procedures. It will also focus on interfaces with the private information systems of terminal operators and customs and maritime agents, on technologies (hardware, software, telecommunications, protocols) and on the interconnection of the maritime lines of the Cap-Haïtien port network with the Port-au-Prince port network.
b) **A container scanning system** to guarantee the smooth flow of port procedures and activities. Container inspection by X-ray scanning at destination is an efficient way to control the quality of containerized goods without unloading them. The scanning speed, ray penetration power, excellent spatial resolution and system flexibility are key factors in ensuring its performance.

Implementation Factors

Given that the National Port Authority (APN) is both the regulator and operator of ports in Haiti in accordance with the Decree of March 15, 1985, it is the entity that will be responsible for implementing the intervention and will work with the General Customs Administration (AGD) to

identify the nature of goods and the application of taxes.

Specifically, the costs to be incurred are: costs related to the acquisition of necessary goods and services, costs related to the installation of a single electronic port portal, training costs for system users (single portal and port computing system), costs of annual salary increases, recurrent maintenance and upkeep costs, and costs related to electrical work. Given that Haiti has weaknesses in technology supply, this intervention is likely to have pressure effects on the gourd because the inputs of the intervention will be imported.

The implementation schedule of the intervention extends over four years. The commencement of activities will take place six months after the financing—time to build up the management and monitoring teams. The indicators of success are number of technicians trained, amount of passage time for goods at port, price level of port services, currency gain, etc. Port-au-Prince international port services are more flexible given port and customs advancements. The risks of the intervention are linked to a lack of pilotage and monitoring of the intervention.

Justification for the Intervention

The international port of Cap-Haïtien is the second most important Haitian port after the international port of Port-au-Prince. Located on the northern coast of Haiti, it provides direct access to markets in the northern departments, which are very far from the capital. It serves about 10% of the country's population. The geographical position of the port in the Caribbean basin allows it to directly serve the United States and to establish simple connections to the major global centers of the region. Therefore, its potential to facilitate exports and imports of products is significant.

Its competitive advantages are accentuated by the proximity of existing commercial activities such as the Industrial Development Company (CODEVI), the Caracol industrial park and Agritrans. The extension of the HOPE/HELP law is a powerful incentive for the textile sector, active in these two industrial parks.

Specifically, the benefits to be derived from the intervention are resource gain from restrictions on movement, increased international trade through increased customs take-up and annual

currency gains, strengthening of security via capturing some of the resources lost to smuggling, reducing the prices of port services in Cap-Haïtien, time savings in procedures (unmeasured benefit) and transferring skills (unmeasured benefit).

Summary Table of Costs and Benefits

Intervention	Benefit (in gourdes)	Cost (in gourdes)	Benefit-cost ratio	Quality of data
Computerization of procedures at the international port of Cap-Haïtien	5,250,995,918.39	753,455,269.50	6.9692	Average

Notes: All figures are based on a discount rate of 5%.

1. Introduction

The development of international trade remains a significant element in the growth of economies. It, therefore, becomes important to consider the exchange between economies as a veritable accelerator, a vehicle for increasing the gross domestic product of a country. If the opportunities offered by international trade are effectively exploited, they are likely to enable the weakest economies to accelerate the pace of approaching sustainable development goals.

According to a note by the UNCTAD secretariat on international trade in the post-2015 development agenda in developing countries, the weight of trade in economic activities is not insignificant. The average trade-to-GDP ratio has increased from 27% (1986-1990) to 60% (2008-2012) even in the least developed countries (LDCs).

The Haitian economy has a permanent deficit in its trade balance (XM) due to its large proportion of imports from partner economies (According to the ONE, Haitian imports from the Dominican Republic (DR) amounted to $1.42 billion in 2014). This is a situation that has worsened since the earthquake of 2010. Currently, the balance falls to -236 million US dollars[1].

The unfavorable trade balance situation is above all a question of competitiveness between regional markets for goods and services. This competitiveness depends greatly not only on the ability of the Haitian economy to maintain a price level that is capable of reducing the import-export gap, but also on efficiency in the commercial services of the rest of the world despite competition. Haiti is not very competitive in prices or in the use and control of information and communication technologies.

In 2013, the World Bank's World Competitiveness Report described the internal conditions that determine the level of competitiveness of the Haitian economy, as well as a comparative

[1] World Trade Organization, 2017, latest updates

analysis of the prices of maritime transport services in the Caribbean region: *Haiti's structure of cost of transport by sea is not competitive compared to similar services in the Caribbean region—the costs of loading and unloading a standard container at Port-au-Prince are by far the highest of the Caribbean ports. According to TranSystem, the total cost by TEU was US$595 by Haitian private operators at Public Berths, and US$445 in Haiti Terminal Varreux, compared to US$121 in Puerto Rico, US$109 in the Dominican Republic, US$109 in Port the Point Lisas in Trinidad and Tobago, US$156 in Port of Spain in Trinidad and Tobago, and US$154 in Miami. (***Haiti—Let's Talk Competition, A Brief Review of Market Conditions, 2016***)*

The Cap-Haïtien port is experiencing a sub-optimal performance situation. Indeed, the operating conditions of the port do not correspond to international standard measures. Customs clearance times can range from 4 to 8 days, while in other Caribbean countries, the delay is less than 24 hours. In 2014, the logistics costs of port passage at the national level were US $1555 per import container and US $1200 for export, including administrative costs, document costs, handling and technical control. Port performance indicators accompanied by red dots (www.worldbank.org).

	Haiti	Dominican Republic	Latin America and the Caribbean
Import costs (USD/container)	1555	1145	1666
Export costs (USD/container)	1200	1040	1287
Import delay (days)	26	10	18
Export delay (days)	28	8	17
Imports (% of GDP)	54	30	23
Exports (% of GDP)	18.9	25.6	19.8

www.worldbank.org

Efficient management of port operations is beneficial to the competitiveness of the whole country. This efficiency is beneficial to the national economy (source of income). It also helps the government in establishing a national and international policy, protecting the country from fraud, combating illegal trafficking in prohibited and restricted goods, providing statistical information on foreign trade transactions relevant to economic planning and encouraging

international trade.

From an economic growth perspective, focused on the development of the country's international trade, we propose the computerized redevelopment of the Cap-Haïtien port. The aim is to reduce customs clearance times and port passage costs. Concretely, we propose the computerization of port modes of operation through the establishment of a single electronic port portal and non-intrusive control technology.

2. Literature Review

Port Passages in the Countries of the South

A 1994 study demonstrated the relationship between computerization and increased international trade in developing countries. The flow of information without the help of a computer system is done through disparate materials (docking orders, manifests and bills of lading). These procedures for the transmission of information involve processing costs of documents in the range of 7 to 10% of the value of the goods, frequent retyping and transit times of 10 days average duration. This study shows that competitiveness in terms of delays is a major aspect of development strategies. New Information and Communication Technologies (NICTs) are excellent means of obtaining comparative advantages and increasing logistics capacity in ports. In Morocco, the Customs and Administration System and Exchange Office has considerably reduced the time required for clearance formalities and increased the availability of statistics on port data.

The Importance of NICTs in Customs Operations

The importance of port computer systems is amply demonstrated in a study carried out by the Economic Commission for Africa (CEA): SINGLE PORTAL: A TOOL FOR TRADE FACILITATION, published in June 2008. This work explains how it is not well advised to promote effective international trade without "customs being called into question, because it is at the heart of the international trade of a country." In addition, the physical security of goods and merchandise must be a priority to counteract smuggling, fraud and loss to the economy. It is imperative to

monitor non-intrusively. It is important to set up container scanners capable of initiating a drastic reduction in physical inspections, so that there is a substantial reduction in fraud. In addition, the virtual tracking of goods and the traceability of the elements in transit is an asset of efficiency. These are performance criteria integrated into port development strategies. Finally, the single electronic port portal is likely to increase the competitiveness of national enterprises through the attractiveness of ports; it falls within the framework of investment promotion programs.

Automation of the Customs System in Haiti

In the context of a public-private partnership (PPP), it has been demonstrated that the automation of customs procedures and the capacity building of port personnel can both reduce customs clearance times from four days to two hours, allow for the generation of statistics on Haiti's foreign trade and also harmonize procedures. The SYDONIA World software is able to manage the electronic processing of manifests and declarations. In addition, this case emphasizes the importance of political will in the success of these types of projects in Haiti. This project served as secondary data sources for our intervention.

3. Calculation of Costs and Advantages

Calculation of Costs

The single portal port project, coupled with a non-intrusive control system, requires significant costs that are measurable for the most part and are not measurable for all. Due to the tangibility of some of these costs, we will talk about direct and indirect costs. The direct costs will be perceptible even during the implementation of the intervention's activities. These are the principal routine management expenditures (supplies, services etc.) incurred during each stage. Other indirect, less perceptible and less predictable costs are likely to be caused by the consequences of a surge in activities in the port. For example, the cost of decongesting (unmeasured cost) road traffic around the port at peak times. The congestion of road traffic would constitute negative externalities for society and the environment of the project because of the insalubrity with which it is accompanied.

❖ **Acquisition Costs of Goods and Services Required**

These costs are the first to be incurred for the project, as the computer and electronic equipment will be the means of exchanging data between all the actors in the Cap-Haïtien port's logistics chain. According to SYDONIA World implementation project at Port-au-Prince customs, these costs are estimated at about 277 million gourdes and represent 34% of the total costs of the project. The deployment of the new port operations makes these expenses imperative for the proper functioning of the computerized redevelopment project of the Cap-Haïtien port. This cost includes the acquisition of computer equipment—the purchase of computers, printers and scanners, worth nearly 2 million gourdes or 0.91%. A power generator unit (inverter, batteries, generators) worth about 2 million gourdes or 0.73%. The order of an internet band for operator interconnectivity is estimated at approximately 435 thousand gourdes or 0.16%. The cost of non-intrusive container inspection technologies—two x-ray scanners—is estimated at almost 272 million gourdes or 97.93%. And finally, expenses for the backup of port data through the acquisition of mirror server are 748 thousand gourdes or 0.27%. These disbursements will be spread over the first and second years at 70% and 30% respectively. This is evaluated under the assumption of inaccurate predictions of materials and services required in quantity and type.

❖ **Installation Cost of Single Electronic Port Portal**

This cost aggregates all the operations necessary to create an interface common to all the users, customers and actors of the Cap-Haïtien port. These include, among other things, the acquisition of commercial software (including electronic payment modules, installation, portal adaptation to Cap-Haïtien's port requirements and software maintenance. Engine and user interface modules, developed by UNCTAD, are the core of the data processing and management system of the software update if new versions emerge; and technical assistance. The total expenditure required for the establishment and operation of this unique portal amounts to approximately 340 million gourdes, that is, 42% of the total costs. The amount is distributed over the first four years and decreases by 40% (**135, 969,916.80 gourdes**), 30% (**101, 977,437.60 gourdes**), 20% (**67,984,958.40 gourdes**), and 10% (**33,992,479.20 gourdes**) on, respectively, the first, second, third and fourth year of the project. This distribution is made

because of the first tests of the system and the needs of adaptation, re-evaluation and total integration of the needs of the Cap-Haïtien port in the electronic port system.

- **Cost of Training for System Manager-Users (Single Portal and Port Information System)**

These costs derive from the need for a workforce that is able to use and adapt to the new port strategy based on automated procedures. The operation of the system requires the port staff to have perfect control of the new methods of managing operations in the port. This training of human resources to accompany port development will be carried out in the first years of the intervention. These disbursements for the transfer of port computer skills to users amount to nearly 5 million gourdes or 0.68% of the total expenditure incurred. This amount is allocated in the second, third and fourth year respectively in 16.7% and 41.7% (third and fourth year) with the assumption of one training per annual session.

- **Cost of Salary Increases for Trained Technicians**

The training of manager-users increases their competence in terms of efficiency, precision and skill in the management and operation of the port. The increase in the technical capacities of trained managers leads to other wage costs. They are estimated at about 29 million gourdes or about 3.67% of the total costs. Allocated over the duration of the project as follows: approximately 2 million gourdes or 8.3% each year from the fourth year of the project.

- **Maintenance and Upkeep Costs**

Software and hardware obsolescence can affect the performance of the port's computer system. As a result, maintenance and upkeep costs are necessary, especially in updating port applications and equipment renewal. These are expenditures in technical assistance for periodic evaluation of the computer system. This cost category includes recurrent expenditures over the life of the project. These costs are estimated at 20% of the total cost of the intervention, distributed at nearly 13 million gourdes each year or 8.33% annually.

- **Cost of Electrical Works**

One of the significant costs of the project to automate port procedures remains that of electrical works. It includes expenses for electrical conditioning work (installation of electrical

room for circuits, earthing, wiring and physical security) at a cost of approximately 3 million gourdes. The main sources of supply and distribution consist of the implementation of a system of automatic transfer, of development of supply lines at a cost of about 9 million gourdes. A backup system for servers is valued at nearly 12 million gourdes. These amounts include the cost of accessories and electrical labor. They may be in a range of +/- 15% of actual implementation costs.

Calculation of Benefits

- **Gain in Resources Related to Restrictions on Travel**

The intervention, with the automation of port services, will make it possible to save resources related to restrictions placed on travel that mobilizes fuel costs. To calculate the amount of these resources gained, the product of the cost of annual travel by the number of operators in the port logistics chain is calculated. This calculation shows a resource saving of about 120 thousand gourdes.

- **Increased International Trade**

The increase in international trade in the intervention is seen from two angles:

(a) The amount of the increase in customs take is calculated by subtracting the estimated customs value with the intervention[2] from the current (counterfactual) customs value at the Cap-Haïtien port. This calculation shows an annual customs value gain of close to 100 million gourdes.

(b) The amount of the annual foreign revenue generation is calculated by subtracting the value of the total exports of goods estimated with the intervention[3] from the current value of the total exports of goods (counterfactual) at the Cap-Haïtien port. This calculation shows an annual gain of nearly 13 million gourdes.

- **Strengthening Security**

The strengthening of security in terms of state capture of a part of smuggled resources is

[2] According to the assumption of an annual increase in the customs value of 2%
[3] Assuming an annual increase in the value of total exports of goods by 2%

measured by subtracting the estimated reduced losses of smuggling [4] with the intervention from the total losses evaluated in smuggling at Cap-Haïtien. This calculation shows that the state is capturing resources amounting to about 374 million gourdes in terms of reinforcing security with the intervention.

- **Reduction in the Prices of Port Services in Cap-Haïtien**

The amount of the price reduction for port services is calculated by subtracting the value of the port passage cost in the value of the merchandise estimated with the intervention from the present value of the port passage cost in the value of the goods (counterfactual). This calculation shows a gain of financial resources of nearly 284 million gourdes.

Calculation of the Benefit-Cost Ratio (BCR)

The calculation of the BCR is based on the following formula:

BCR = Present value of cash inflows of economic benefits/Present value of cash outflows of economic costs, taking into account the discount rate.

5. Conclusion

The Cap-Haïtien port would be more efficient in providing services with the automation of its procedures. This will support the economic competitiveness of Haiti as well as the creation of wealth by improving the passage time of goods, eliminating non-tariff and procedural barriers, using high-tech technological tools, fighting smuggling and investing in the training of technicians.

Calculations showed that the benefit-cost ratio for discount rates of 3%, 5% and 12% is greater than 1. This means that the economic benefits are greater than the economic costs. In other words, the intervention will generate wealth. Therefore, this intervention should be undertaken.

[4]Assuming an annual reduction of 1%

Summary Table

Intervention	Discount rate	Benefit (in gourdes)	Cost (in gourdes)	Benefit-cost ratio	Quality of data
Computerization of procedures at the Cap-Haïtien international port	3%	6,349,640,093	799,854,513.30	7.9385	Average
	5%	5,250,995,918	753,455,269.50	6.9692	
	12%	2,846,276,781	639,676,163.76 617,874,064.08	4.4988	

Notes: Calculation of the authors

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Haiti faces some of the most acute social and economic development challenges in the world. Despite an influx of aid in the aftermath of the 2010 earthquake, growth and progress continue to be minimal, at best. With so many actors and the wide breadth of challenges from food security and clean water access to health, education, environmental degradation, and infrastructure, what should the top priorities be for policy makers, international donors, NGOs and businesses? With limited resources and time, it is crucial that focus is informed by what will do the most good for each gourde spent. The Haïti Priorise project will work with stakeholders across the country to find, analyze, rank and disseminate the best solutions for the country. We engage Haitans from all parts of society, through readers of newspapers, along with NGOs, decision makers, sector experts and businesses to propose the best solutions. We have commissioned some of the best economists from Haiti and the world to calculate the social, environmental and economic costs and benefits of these proposals. This research will help set priorities for the country through a nationwide conversation about what the smart - and not-so-smart - solutions are for Haiti's future.

For more information visit www.HaitiPriorise.com

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Copenhagen Consensus Center is a think tank that investigates and publishes the best policies and investment opportunities based on social good (measured in dollars, but also incorporating e.g. welfare, health and environmental protection) for every dollar spent. The Copenhagen Consensus was conceived to address a fundamental, but overlooked topic in international development: In a world with limited budgets and attention spans, we need to find effective ways to do the most good for the most people. The Copenhagen Consensus works with 300+ of the world's top economists including 7 Nobel Laureates to prioritize solutions to the world's biggest problems, on the basis of data and cost-benefit analysis.