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Benefit-Cost Analysis

Digitization of land registers in Haiti



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DIGITIZATION OF LAND REGISTERS IN HAITI

Haiti Priorise

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Ministry of Planning and External Cooperation

Working paper as of April 19, 2017.

Translated from French by Steffaney Zohrabyan, professional translator.

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This work has been produced as a part of the Haiti Priorise project.

This project is undertaken with the financial support of the Government of Canada. The opinions and interpretations in this publication are those of the author and do not necessarily reflect those of the Government of Canada.

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1. Background

The right of ownership, fundamentally linked to human rights, is sacred and constitutes the foundation of our economies and societies. It is explicitly legally included in the Haitian Constitution of 1987, which reaffirms and strengthens the citizen's rights to property and private initiative. *Private property is recognized and guaranteed. The law determines the terms of acquisition, enjoyment and the limits* clarified in article 36 of the Constitution. This right of ownership, pursuant to Articles 36-3 and 36-4, *also include obligations. No use may be made of it contrary to the general interest.* And more specific to land sector, *the landowner must cultivate, exploit the soil and protect it, especially against erosion.*

The land issue arises in the broader issue of property rights, both in terms of the size of the land and its particular character. Indeed, as a factor of social mobility, soil is, unquestionably, the primary, basic basis for the development of territories. In addition, land ownership includes, in principle, rights to space and resources on the ground and the subsoil. However, the total and exclusive character of the rights can undergo many restrictions. In some cases, there may be a dissociation of the ownership right of the soil and the subsoil (mineral deposits, mines, etc.), or the soil and natural resources that are sheltered there. There are also easements such as the right of way in matters of enclaves.

Today, land law is currently being re-examined and re-evaluated on a global scale. There has been a growing recognition of the fact that securing land rights plays a key role in the economic and social development of a country. Land conflicts are indicative of the current complexity and dynamics in Haiti.

Indeed, Haiti covers an area of about 27,750 km² and the total population is estimated in 2015 at 10,911,819 inhabitants by the Haitian Institute of Statistics and Informatics. With a current density of 393 inhabitants / km², pressures on land have led to an exponential increase in the value of land and major conflicts that disturb the public peace. Lack of clarity in the land sector leads to a state of insecurity which weakens investments. Moreover, land use does not respond to a comprehensive development and land-use policy. Among other things, these major features dominate the Haitian land structure:

- A tradition of private ownership giving rise to a small and generalized property divided by egalitarian sharing;
- The State's sector is indefinite and poorly located and represents 10% of the national territory;
- Informality of most transactions and land transfers;
- Land insecurity resulting from institutional weaknesses;
- Irregularity of property titles;
- Land disputes that are difficult for the justice system to deal with;
- Irrational management of archives entailing transaction costs of up to 25% of the value of the property (Land Task Force, Haiti).

On an institutional level, the entity responsible for rural and urban land registry information is the National Land Registry Office (ONACA) which is part of the Ministry of Public Works, Transport and Communications, and was established in 1984. The mission of the Office is to establish the general land registry of the Republic. Yet a report on land in Haiti produced in May 2010 by the Haitian Government and the OAS specified that the ONACA covered only 5% of the country, particularly in certain sectors of the greater Port-To-Prince, and others in the Artibonite Valley region. ONACA's capacities are greatly reduced, the report goes on to say. *With limited financial resources, outdated technology and staff lacking training.*

As for the General Directorate of Taxes (DGT) through its Directorate of Land Registration and Conservation, it archives, transcribes and formalizes the land title after receiving it from the surveyors and notaries who prepare and certify the land title data. It is responsible for the titling of all public lands, but under customary practices, notaries issue titles of private property.

In light of these findings, it is clear that the land issue is an uncontrolled fact in Haiti. This raises issues and prompts us to ask these questions: How can we overcome the obstacle of land because of the litigation, the constraints, the illegal occupation of land, the costs of administration and transaction by the promotion of a new land management system focused on

the digitization of land records in order to reduce the time and costs of transactions? What are the costs and benefits of land title digitization at the corporate level?

The study is subdivided into eight (8) sections:

1. Research Methodology
2. Land transactions in Haiti and the status archive management
3. Description of the proposed intervention: "digitization of land archives"
4. The costs and benefits of digitization
5. The different hypotheses of the study
6. The analysis model
7. Limitations of the analysis model
8. Bibliographic References

2. Research Methodology

The methodology of the study is essentially based on the classical methods of participatory research. It is a matter of consulting and analyzing the available documentation while coupling it with the results of interviews with the various categories of participants involved in the management of land in Haiti.

A) Several documents and reports were consulted and analyzed. Without being exhaustive, it is specifically worth mentioning:

- (A) legal texts: the Haitian constitution of 1987, the decree of 28 September 1977 on land registration and conservation in Haiti, the Decree of 27 November 1969 on Notaries, and the Decree of 26 February 1975 on Surveying.
- (B) documents, reports and studies on land management:
 - *Land tenure in Haiti*: Raymond Renaud, 1934;

- *Modernization of the land registry and land rights infrastructure in Haiti*, Report prepared by the Government of Haiti and the OAS, 2010;
- *Legal sale of property in Haiti*, a guide prepared by the Habitat for Humanity, 26 June 2012
- *Securing land rights in Haiti*, A practical guide written by the Habitat for Humanity, 1 December 2014
- *New vision for the management of the land registry of Haiti*, ONACA, 1^{October} 2014
- *"Benefits and Costs of Land Records in Bangladesh"*, Dr Sultan Hafeez Rahman and Sumaiya Kabir Talukder, 2016

(C) A review of the literature on the costs and benefits of digitization:

- *"Designing Land Registration Systems for Developing Countries"*, Tim Hanstad, 1998
- *"Going digital: Credit effects of land registry computerization in India"*, Klaus Deininger, Aparajita Goyal, 2012

B) Semi-structured interviews were carried out with senior officials from the Directorate General of Taxes, the National Land Registry Office (ONACA), Notaries and Surveyors to identify the problem of land management in Haiti.

3. Land transactions in Haiti and the archive management situation

Today, the legal status of land is separated into three types in Haiti:

- The little known private domain of the state, which is valued at 10% of the surface of the country,
- The public domain (roads, seashores and rivers, etc.),
- Private property validated by land titles. In practice, small private ownership and joint ownership is the legal status of a significant part of the land.

Ownership of properly purchased plots is considered the most desirable form of land access. However, the procedures are complex and the cost of establishing a new title in a transfer is often high.

According to the Working Group on Land Law in Haiti, the procedure for sale by authentic deed can be divided into 4 major steps, including:

1. **The promise of sale;** marks a formalization of the negotiations between the buyer and the seller. It reflects the decision that the sale of a landed property should take place, and finds conditions such as a description of the property and the price.
2. **Surveying;** is a land surveyor's process of measuring and documenting dimensions, boundaries and the surfaces of the terrain. It includes an analysis of the history of the terrain and determines the uses of the terrain.
3. **The authentic act of sale;** is the official procedure for completing a sale through authentic deeds and requires the intervention of the notary to compile all the documentation that guarantee due diligence due to the land, such as the verification of the seller's right of ownership and the identity of the buyer and seller.
4. **The recording and transcription of the deed of sale;** is the final step of the procedure and consists of authenticating the deed of sale, with payment of the duties, taxes and expenses to the DGI. Once this step is confirmed, the authentic act of sale is final.

The land titles are archived at the DGI. The management of these archives remains, until today, documented. Since 1824, the central office has accumulated a register of 2,500 books, which have never been digitized for the purpose of streamlining and modernizing the process, resulting in high transaction and administrative costs and the weakening of property titles.

It should be noted that the DGI has recently digitized part of the archives for the sole purpose of retaining them but not for digitized management purposes in order to streamline the process. The management is always documented, access to the information has not been modified and the digitized archives have no authentic value. Also, pilot experiments by the Interministerial

Committee for Territorial Development (CIAT) in some municipalities in the country are too relatively weak to bring about significant changes in the land archive digitization system.

4. Description of the proposed intervention: "digitization of land titles"

The aim of this intervention is to make land services efficient and effective so that they can satisfy the demands of the users as soon as possible. It allows us not only to economize in terms of spending, but it also reduces fraud and land ownership disputes.

The main components of land title digitization include:

- Inventory and restoration of land archives for their digitization
- Acquisition of computer equipment
- Design for the land software system
- Digitization and vectorization of land and topographic documents
- Backup of land and topographic information
- Implementation of the computerized information system
- Training of land services officers

5. Costs and benefits of digitizing land archives

The objective of this study is to analyze the costs and benefits of digitizing land registers.

Implementation of the digital recording system involves costs. These are mainly: development costs (acquisition costs for servers, computers and software, and others); the operating costs (technicians' salaries, internet connection fees, etc.). Digitization also involves judicial costs related to "dormant conflicts" given the irregularity of certain extra-legal titles. These costs are very high for the society and are damaging the initiatives of the governments for the modernization of the land management in Haiti.

In terms of benefits, the digitization of land registers improves management efficiency and tenure security. It should make it possible to secure the land owners at a lower cost and with an

acceptable delay. Advantages related to digitization include: time cost savings, administration (storage) costs savings, and other benefits related to the reduction of interest payments on loans.

Measuring the impact of this intervention amounts to calculating the benefit/cost ratio (BCR) to analyze whether the intervention has a net benefit on society.

5.1 Description of Costs

The costs of digitization are mainly related to the acquisition of computer equipment, the implementation of the computer system and its maintenance, the payment of technician salaries, costs of conflicts of the judicial administration and other start-up costs.

It should be noted that the costs of conflict judicial administration occupies an important part in the digitization given the high number of irregular titles in Haiti. Thus, any modernizing land management policy must first and foremost minimize these costs while seeking to normalize (legalize) certain social accommodations stemming from customary law. The strengthening of the judicial system must therefore also be pursued.

The costs of digitization include: system development costs and operating costs.

Costs 1: costs of digitization development

- Software cost
- New computers
- Cost of digitizing existing archives
- Cost of extending the system to private professionals (Notaries)
- Costs to raise awareness for the population
- Other start-up costs

Costs 2: Operating (storage) costs

- System Analyst Salaries

- Internet connection fees
- Costs of general interest information
- Computer system maintenance costs, including software licenses renewal and computer replacement. These costs are estimated at 15% of the total cost of equipment and materials and are applied every five years.
- Cost related to "dormant conflicts" that will be generated by the digitization and regularization of problem titles during digitization

5.2 Description of digitization benefits

In addition to improving the security of land tenure, establishing the formal land market and reducing litigation, the digitization of regular titles has advantages supported by the economic literature. The main advantage of digitization is the reduction of time and cost savings on the digital tenure of the archives (lower administration costs and land transactions). It also allows for greater access to credit, as land rights and loan security will improve, which will ultimately impact the reduction of interest rates on informal loans, either because the risks of borrowing has decreased, or because the number of borrowers will increase and this will lead to competition between them. The benefits of digitization include:

- Administration and storage cost savings (Reduction, storage costs, DGI)

The costs of administration and storage imply the costs of managing and preserving the land archives for the State. For this, the State employs a large number of staff to ensure the management, conservation of land titles and the production of the necessary information for all interested persons. In addition, it acquires storage equipment (buildings, chairs, desks, filing cabinets, printers, ink, papers,...) and despite this, the preservation of archives has a high risk of loss. The earthquake of January 12 is a testament of the fragility of securing land titles in Haiti.

- Operational cost savings (Reduction, staff costs, DGI)
- Annual cost of time savings (Time gained)

These are those that are related to the information acquisition time by all the participants involved in the process. They measure the opportunity costs of land transactions; that is, which can be used alternatively to other economic productive activities. The time to search for existing ownership titles is estimated to be between 3 and 12 months. The waiting time from the moment the notary submits the file to the DGI for registration and payment receipt is estimated between 3 and 18 months.¹ The average waiting time of 6 months was retained for both operations. Assuming that the digitization accelerates considerably the dissection of the archives, it is assumed that the time saved will be 5 months.

- Reduction of interest payments on loans
- Costs of land transactions (excluding costs of ownership)

The costs of land transactions (excluding costs of ownership) are those taken into account in the transaction and documentary search procedures, notably related to sending the survey document with the old title deeds and the preparation of the deed of sale by the Notary.

A study by the land rights Working Group in Haiti in 2012 found that these transactions can last on average 18 months and involve financial costs of up to 25% of the value of the property, including professional fees and the registration and transcription fees at DGI. Due to these high transaction costs, land professionals are less prone and reluctant to reverse the current situation, where the modernization of the land register would limit their margin of profit.

5.3 Calculation of the cost-benefit ratio

The Benefit-cost *ratio* is the ratio of the present value of the benefits and the present value of the costs. The evaluation period for the digitization project is 12 years. The costs and benefits span seven years, the time to digitize the existing archives with a workforce of 150 people. 5 years are added to this duration, time to keep the documented archives to ensure the final transition. Three different discount rates are considered: 3%, 5% and 12%.

¹ https://www.habitat.org/sites/default/files/haiti_english_manual-web.pdf

6. The hypotheses of the study

The different hypotheses on which the analysis model is based include:

- average salary of the economy: 4,830 gourdes
- duration of research and analysis per transaction: 3 months
- total number of land transactions (transactions) per year: 10,000
- total number of transactions recorded to date: 7,000,000
- number of conflicts during the digitization phase: 500,000
- judicial administration cost of a land conflict: 20,000 gourdes
- number of people working on scanning: 150 while retaining 50 after the scanning is completed
- other assumptions in the model annexed to this report.

7. The analysis model

Referring to the appendix of the report, a distinction should be made between two scenarios: i) the scenario including the costs of conflicts; and ii) the scenario excluding the costs of conflicts.

Scenario 1: BCR with conflict costs

The present values of the digitization costs over the 12-year period are 8,954,246,329.74 gourdes; 8,365,855,586.44 gourdes and 6,719,869,399.84 gourdes respectively for the various discount rates of 3%; 5% and 12%.

The present values of the benefits, for the same period, are: 24,733,794,245.24 gourdes; 21,404,328,902.95 gourdes; and 13,478,290,848.03 gourdes respectively for the different rates 3%, 5% and 12%.

The BCR is therefore greater than 1 and assumes respective values of 2.76, 2.55 and 2.00 according to the respective discount rates.

Scenario 2: BCR without conflict costs

Considering the no-cost scenario of the conflicts, the present value of the costs of digitization over the 12-year period is 77,611,898.81 gourdes; 72,865,927.27 gourdes and 60,397,645.67 gourdes respectively for the various discount rates of 3%; 5% and 12%.

The present values of the benefits, for the same period, are: 24,733,794,245.24 gourdes; 21,404,328,902.95 gourdes; and 13,478,290,848.03 gourdes respectively for the different rates 3%, 5% and 12%.

The BCR is therefore clearly very high: 318.68; 293.75 and 223.16 according to the respective discount rates.

This leads us to summarize in the following table:

Table 2: Benefit-cost ratio (BCR)

<i>Discount Rate</i>	3%	5%	12%	Data Quality
<i>BCR: with conflict administration costs</i>	2.76	2.55	2.00	Limited
<i>BCR: without conflict administration costs</i>	318.68	293.75	223.16	Limited

On analysis, these salient features of the model should be retained:

- i. Digitization has a very high development cost for society, taking into account the "dormant" conflicts it will generate during its development phase. However, over the 12-year period alone, it will generate significant benefits greater than these conflict costs. For each gourd invested, it is expected to be more than doubled.
- ii. Excluding the costs of conflicts (the state must make the necessary arrangements to regularize certain social accommodations in order to allow the smooth transition to digitization), the BCRs are very high: 318, 293 or 223 using the respective discount rates of 3%, 5% or 12%. A very high return on investment over the 12-year period will therefore be expected.

- iii. Given the limited quality of some data, such as the nature and extent of land conflicts, it would be interesting to consider sensitivity analyzes on some model parameters to simulate other BRC scenarios.

8. Limitations of the analysis model

The limitations associated with the results of the model are mainly related to:

- o the constraints of access to information and the quality of certain data
- o to the limited estimation of data on the number and duration of land transactions in Haiti
- o the uncertainty of estimates on the number and cost of administering land conflicts
- o the non-availability of key players during the conduct of the information gathering survey.

9. Conclusion

In the end, digitization is a recommendable action within the scope of securing land titles in order to attract private investment. However, it is not easy to change a land structure that has been built up and strengthened for several centuries, irrespective of its dysfunctions. Solutions must be found, but also must not provoke seismic shifts and the basic needs of the society must be taken into account. Supporting actions should accompany it, such as:

- o within the scope of an open dialogue, a permanent debate, implement a land policy that respects the right of ownership, which protects the rights of land users. This land reform must contribute to social peace.
- o the revision of the legal scope on land for the purposes of adaptating. This intervention is an uphill battle in order to provide the country with a powerful legal framework capable of taking account of social accommodations, allowing the legal analysis of property titles and the authentic recognition of digitized archives, so that they equal legal value of material archives;
- o the regularization of titles and the strengthening of justice;

- the strengthening of institutions and professionals working in the land sector in Haiti;
- training for participants in the use of dematerialized information.

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APPENDIX: Calculation Model

A. Hypotheses

Hypotheses	Base year 2017	Unit	Sources / Comments
Assessment period	12	year	
Discount Rate	3%, 5% or 12%		CCC
Average salary / month (economy)	4,830	gourdes	MEF
Salary / month (civil service)	18,000	gourdes	MEF; Half of the average
Population	10,911,819	persons	IHSI
GDP	484,351	millions of gourdes	MEF
GDP Per capita	43,722	gourdes	MEF
Number of people working on land registration and conservation	200	persons	DGI
Number of people working on scanning	150		We will retain 50 after the scanning is completed
total number of land transactions per year: 10,000	10,000	transactions	DGI
Total number of registered transactions	7,000,000	transactions	DGI
Number of conflicts	500,000	conflicts	MJSP
Scanning rate	4	per hour	
Scanning productivity	7,680	per year, per capita	
Time to scan archives	6.076388889	years	Archives will be kept for five more years
Peace courts	140		
Number of cases handled by a judge	2	per day	
Adjudication rate	78,400	per year	
Court administration costs	20,000		
Private cost to register a plot, USD	600	per plot	www.iadb.org/fr/infos/communiqués-de-presse/2012-04-25/appui-a-la-regularisation-de-tenure-fonciere-rurale-en,9960.html
Private cost to register a plot, after intervention	150	per plot	
Interest Rates, formal sector	11%		
Interest Rates, informal sector	43%		

Percentage of population lending from the informal sector	36%		
Number of people lending in the informal sector	3,928,255		
Borrowing value, on average, USD	542		
Number of loans	0.1	Per year; One loan every ten years	

C. Specifications and calculation of the analysis model

Years	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Number of digitized archives	1,152,000	1,152,000	1,152,000	1,152,000	1,152,000	1,152,000	88,000					
Cumulative land records	1,152,000	2,304,000	3,456,000	4,608,000	5,760,000	6,912,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000
Costs												
Cost of personnel, digitization	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000	206,250					
Conflit	1,568,000,000	1,568,000,000	1,568,000,000	1,568,000,000	1,568,000,000	1,568,000,000	470,400,000					
Hardware	15,000,000											
Software + training	15,000,000											
Others (Office automation, workspace, etc.)	5,000,000											
Maintenance					4,500,000					4,500,000		
Notary computer network	750,000.00											
Internet	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000	2,000,000
Raising awareness with the population	1,000,000											
Total costs	1,609,450,000	1,572,700,000	1,572,700,000	1,572,700,000	1,577,200,000	1,572,700,000	472,606,250	2,000,000	2,000,000	6,500,000	2,000,000	2,000,000
Updated costs, with conflicts												
3%	8,954,246,329.74											
5%	8,365,855,586.44											
12%	6,719,869,399.84											
Updated costs, without conflicts	41,450,000	4,700,000	4,700,000	4,700,000	9,200,000	4,700,000	2,206,250	2,000,000	2,000,000	6,500,000	2,000,000	2,000,000
3%	77,611,898.81											
5%	72,865,927.27											

12%	60,397,645.67											
Years	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Benefits												
Reduction, storage costs, DGI								20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Reduction, staff costs, DGI								2,700,000	2,700,000	2,700,000	2,700,000	2,700,000
Reduction, costs (private) of plot registration								285,187,500	285,187,500	285,187,500	285,187,500	285,187,500
Reduction, transaction costs, notaries		49,346,743	74,020,114	98,693,486	123,366,857	148,040,229	149,925,000	149,925,000	149,925,000	149,925,000	149,925,000	149,925,000
Time saved		79,488,000	119,232,000	158,976,000	198,720,000	238,464,000	241,500,000	241,500,000	241,500,000	241,500,000	241,500,000	241,500,000
Reduction of interest payments on loans		917,398,670	1,376,098,005	1,834,797,340	2,293,496,675	2,752,196,009	2,787,235,542	2,787,235,542	2,787,235,542	2,787,235,542	2,787,235,542	2,787,235,542
Total benefits	0.00	1,046,233,412.68	1,569,350,119.02	2,092,466,825.36	2,615,583,531.70	3,138,700,238.04	3,178,660,542.00	3,486,548,042.00	3,486,548,042.00	3,486,548,042.00	3,486,548,042.00	3,486,548,042.00
3%	24,733,794,245.24											
5%	21,404,328,902.95											
12%	13,478,290,848.03											

D. BCR Calculation

Scenario 1: BCR with conflict costs					
Intervention	Reduction	Benefit	Cost	BCR	Quality of evidence
Intervention: Digitization of land archives	3%	24,733,794,245.24	8,954,246,329.74	2.76	Limited
	5%	21,404,328,902.95	8,365,855,586.44	2.55	
	12%	13,478,290,848.03	6,719,869,399.84	2.00	
Scenario 2: BCR without conflict costs					
Intervention	Reduction	Benefit	Cost	BCR	Quality of evidence
Intervention: Digitization of land archives	3%	24,733,794,245.24	77,611,898.81	318.68	Limited
	5%	21,404,328,902.95	72,865,927.27	293.74	
	12%	13,478,290,848.03	60,397,645.67	223.15	

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 *Haiti Priorise* project will work with stakeholders across the country to find, analyze, rank and disseminate the best solutions for the country. We engage Haitians 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.



Haiti Priorise

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