Inter-American Development Bank Document

**Jamaica**

**Public Sector Efficiency**

**(JA-L1046)**

**Economic Analysis**

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1. **Introduction**
   1. This document presents the ex-ante economic analysis of the Public Sector Efficiency Program (JA-L1046), whose execution is designed for the 2014-2018 period. The analysis will be realized under the Cost- Benefit Methodology.
   2. The Public Sector Efficiency Program (“the Program”, onwards) has as general objective to improve the efficiency of the Public Sector of Jamaica. The Program will be financed by the Inter-American Development Bank (IDB).
   3. The Program will finance the following activities, grouped in three components:
   4. **Component 1: Human Resources Management (HRM). (US$18,578,535).** This component will finance activities aimed at improving efficiency of personnel expenditures and strengthening the government’s capacity for more efficient HRM. These will include:
   5. Implementation of a Human Capital Management Enterprise System (HCMES)[[1]](#footnote-1) covering the entire public sector[[2]](#footnote-2). The HCEMS will include a payroll solution allowing that employees’ salary and salary-related data be entered and maintained in the core HCMES. The operation will finance: (a) the procurement of the HCEMS; (b) the implementation and roll out of the system across the public sector; (c) ICT infrastructure; and (d) training for administrators and users.
   6. Strengthening the capacity of the Strategic Human Resources Management Division (SHRMD) within the MOFP[[3]](#footnote-3) for: (a) strategic HRM planning; (b) policy formulation and for coordination of its implementation with HRM units in MDAs and public bodies; (c)development of key HRM processes for the HCMES in coordination with HRM units in MDAs; (d) quantitative and qualitative analysis of HCMES data, and, (e) the adoption of a communication strategy of wage bill contention efforts as well as change management activities.
   7. **Component 2: Information and communication technologies management (ICTM). (US$4,000,000).** This component will finance activities aimed at: (i) strengthening the government’s capacity to lead and implement ICT policy, and (ii) improve efficiency in public service delivery by adopting innovative citizen-centered e-government solutions. These will include:
   8. Institutional strengthening of the new ICT governance framework: the operation will finance technical assistance for: (a) the establishment and organization of the office of the Chief Information Officer (CIO); (b) the design of an e-Government framework and strategy including role definition of relevant stakeholders; (c) the development of key ICT norms and standards; and (d) capacity building and training on key ICT policy areas and subjects.
   9. Automation and simplification of the processes of the GEI; through the introduction of a digital solution to streamline and reduce the time associated with the application and delivery of electricity permits. The operation will finance: (a) the adoption of the web-based Application Management and Data Analysis (AMANDA) system*[[4]](#footnote-4)*; (b) ICT infrastructure; (c) process reengineering for administrative simplification; (d) initiatives to improve communication among stakeholders, transparency, and accountability.
   10. Establishment of a one-stop shop for business registration. A digital solution to simplify the process and reduce the time required to register a business. The operation will finance: (a) the implementation of the online processing of a single Business Registration Form (BRF); and the electronic approval and data sharing among the government agencies involved in business start-up; (b) ICT infrastructure; (c) training of the Tax Office staff so they can offer support to citizens on using the online filing service; (d) implementation of kiosks equipped with computer workstations and digital signing pads that customers will use at the Tax Office in each parish; (e) a communication strategy to promote the new online services and (f) supporting documentation (manual process, online procedures, etc.)
   11. Introduction of Shared Corporate Services: seeking to reduce the costs of providing corporate services over time[[5]](#footnote-5), this operation will support the GOJ to initiate the implementation of shared services in the public sector by introducing shared services for the HR function. The operation will finance: (a) the design and initial implementation of the Operating Model for the HR Shared Service Centre (HRSSC), including the governance framework and the organizational arrangement[[6]](#footnote-6); (c) the definition of technical specifications for the facility that will host the HRSSC [[7]](#footnote-7); (d) the acquisition of workstations for the HRSSC agents; (e) the training of HRSSC agents; (f) the design and acquisition of the ICT infrastructure to operate HRSSC; and, (g) the acquisition and implementation of a case management system.
   12. **Component 3: Control systems and accountability mechanisms (US$6,103,900)[[8]](#footnote-8).** This component will contribute to the GOJ´s PFM-RAP[[9]](#footnote-9) objectives on modernization of procurement process and improvement of the budget control and oversight. The operation will support the following four strands of work (sub-components):
   13. Strengthening the AGD’s capacity for performance (PA) and information technology (ITA) audits through: (a) external auditors in-country training and overseas attachments on ITA; (b) external auditors, in-country training on PA[[10]](#footnote-10); (c) IT equipment (hardware and software) for the use of computer assisted audit techniques (CAAT) software for external audit.
   14. Strengthening the Internal Audit System’s (IAS)[[11]](#footnote-11) capacity, especially for payroll and procurement audits, through: (a) internal auditors’ in-country training on PA; (b) enabling the adoption of modern audit techniques for internal auditors, and (c) the automation of the internal audit process with CAAT’s software for internal audit.
   15. Improving transparency and value for money of public procurement through: (a) training and certification courses for procurement staff; (b) technical assistance to produce a new Procurement Handbook following enactment of the Procurement Law; (c) implementation of e-tendering, including IT equipment; (d) communication and awareness of new Procurement Law, Handbook and e-tendering system among Government and Contractors; and (e) new contractor registration system as a module of the e-tendering system.
   16. Enhancing Parliament’s oversight role, through: (a) diagnosis of Public Accounts (PAC) and Public Administration and Appropriations Committees (PAAC) analytical and reporting capacity and the Office of the Clerk capacity to enable the Members of each House to efficiently execute their Parliamentary responsibilities and duties; (b) following the diagnosis, establishment of a joint Technical Secretariat for technical assistance and research with qualified technical staff to be financed by the project on rolled-out basis for gradual absorption by the Parliaments´ budget; and (c) training to Technical Secretariat and Members of Parliament.
   17. Program administration amounts to US$ 2,967,565.
   18. The total estimated cost is US$31,650,000. It is expected that the the Bank will finance up to US$14,000,000 from the Ordinary Capital (OC) resources under the Flexible Financing Facility. The China Co-Financing Fund for Latin America and the Caribbean will finance up to US$ 11,000,000. The EC is expected to contribute 5,000,000 in Euros with a Project-Specific Grant (PSG) which is equivalent to 6,650,000 in U.S. Dollars, based on the exchange rate of 1.33US$/Euro.
   19. In order to perform the Cost-Benefit analysis the activities of the program will be grouped in two subcomponents: Human Resources Management and Accountability Systems. Quantifiable variables will be identified in each description.
2. **Methodology**

Description of the intervention-Subcomponent 1: Human Resources Management (HRM)

The Subcomponent of Human Resources Management will finance several activities. The main activity that will generate monetary benefits is the implementation of the Human Capital Management Enterprise System (HCMES).

Expected Benefits

* 1. We will focus in two types of benefits. The first of them is linked to the savings due to a reduction of workers in the Human Resources Sector. And the second benefit is given by savings in workforce (for a given level of workers), due to improves in efficiency (better access to processed information guaranteed by the system and ICT). Recent works in Public Sector Efficiency shows that an improvement in efficiency is obtained by reducing the administrative costs[[12]](#footnote-12).

Assumptions

* 1. The benefits estimations of the HRM Subcomponent are based on the following design and assumptions :
  + The discount rate is 12%, according to the standard of the IDB.
  + Conservatively, we assume a reduction of 10%[[13]](#footnote-13) in the total workforce in the Human Resources Sector (estimated at 2.500).
  + The average annual salary for the Human Resources Sector is estimated at USD 9.000, according to PayScale.com.
  + Conservatively assumed that the savings by improves in efficiency are 0,3%[[14]](#footnote-14) of the total workforce in the Public Sector of Jamaica (approximately 120.000 employees).
  + GOJ central government’s wage bill, the main category of expense after debt services, accounted for over 10,7% of GDP in FY 2011/2012. That allows estimate the value of the total workforce in USD 1.325.000.000.
  1. The following assumptions will be used to estimate costs:
  + Costs corresponding to Component 1 are taking into account in this section.
  + We assume that all costs will be executed in the first year.
  + The horizon from which benefits are calculated is 20 years.
  + Additionally, the HRM subcomponent has an annual maintenance cost of USD 1.114.200.

Calculations

* 1. The first step is to obtain the formula for the annual profits. Then, this formula will be reply for each year using the 12% discount rate.
  2. To estimate the total benefits we consider a 20 years horizon. Then, using the 12% discount rate to obtain present values, the following formula can be derived :

Where refers to Human Resources Management Subcomponent, denotes benefits, and represents the current year.

* 1. The program costs are calculated as the present value of all expenditures of the project. The used formula is:

where g is the expenditure for the Human Resources Management Subcomponent (taking into account ICT) and t denotes the current year. The annual cost is USD18.000.000 for the first year, and the maintenance cost in the rest.

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| --- | --- | --- | --- |
| Table 1. Calculus of the monetary value in USD of the annual benefits derives from the Human Resources Management Subcomponent | | | |
| 1 | Average annual salary for the HR Sector USD | 9.000 | PayScale.com |
| 2 | HR posts eliminated % | 10% | Assumption |
| 3 | Total HR posts | 2.500 | Own estimate |
| 4 | Total Value of Workforce USD | 1.325.000.000 | Own estimate |
| 5 | Savings by efficiency % | 0,2% | Assumption |
| 6 | Annual benefits HRM Subcomponent USD | 2.450.000 | [(1)\*(2)\*(3)+(4)\*(5)\*] |

Description of the intervention - Subcomponent 2: Accountability Systems

* 1. The activities of the subcomponent 2 have as main objective to improve the Accountability Systems in Jamaica. An increasing in the total number of audits is expected, as well an increase in the total units audited. These activities have several benefits in efficiency, due to control mechanisms. These activities will be supported by those included in the ICT Management component. So, in this section benefits and costs will be considered as if this component were included in the Accountability Systems subcomponent.

Expected Benefits

* 1. The first group of expected benefits are derived from the increase in units audited per year. The different types of audits contribute to detect and prevent acts of corruption and fraud, and this result in savings for the Government. The second group of benefits are associated to the introduction of e-procurement system. In this case, we expect both a reduction of the administrative costs as a decrease in procurement prices.

Assumptions

* 1. The benefits estimations of the Accountability Systems Subcomponent are based on the following design and assumptions:
  + The discount rate is 12%, according to the standard of the IDB.
  + 111 Ministers, Departments, and Agencies (MDAs) were audited during 2012. Due to the activities of the program, an increasing of 39 MDAs audited per year is expected for 2015, and from there 150 MDAs will be audited each year.
  + Based on Memorandum on the Budget 2012/2013 of Jamaica, the Expenditure for the previous fiscal year (2011/2012) was 403.122.200.000 Jamaican dollars. Using an exchange rate of 102,78 Jamaican dollars for USD, and the Expenditure results in USD 3.922.185.250.
  + The Average Asset Audit is estimated as the rate expenditure-MDAs. It results in USD 35.335.002,25.
  + A linear projection of the increase in MDAs audited is assumed, until reaching the maximum value in 2015.
  + Conservatively, we assume that the Social Benefit Rate for MDAs audited is 0,2%[[15]](#footnote-15).
  + The procurement budget used in the new system ascends to USD 500.000.000. We estimate benefits only over the 25% of this amount.
  + Conservatively assumes that savings due to the e-procurement system are 1%[[16]](#footnote-16).
  1. The following assumptions will be used to estimate costs:
  + We assume that all costs will be executed in the first year.
  + The horizon from which benefits are calculated is 20 years.
  + Costs corresponding to Components 2, 3 and administration costs are taking into account in this section.

Calculations

* 1. The calculations of the annual benefits for the Accountability Systems Subcomponent are detailed in the next table:

|  |  |  |  |
| --- | --- | --- | --- |
| Table 2. Calculus of the monetary value in USD of the annual benefits derives from the Accountability Systems Subcomponent | | | |
| 1 | Average Asset Audit USD | 35.335.002,35 | Own estimate |
| 2 | Expected increase in MDAs audited | 13 | Program Data |
| 3 | Social Benefit Rate | 0,2% | Assumption |
| 4 | Average Margin per Unit USD | 39.432,00 | Own estimate |
| 5 | Procurement Budget | 500.000.000 | Program Data |
| 6 | % of affected Budget | 25% | Assumption |
| 7 | % of savings by e-procurement system | 1% | Assumption |
| 8 | Annual benefits Accountability Systems Subcomponent USD | 1.992.293,57 | (2)\*(4)+(5)\*(6)\*(7) |

* 1. For the present value of the costs of this subcomponent, the same formula is used, but the annual cost is 13.650.000.

1. **Results, sensibility and discussion.**
   1. Due to the great quantity of assumptions in that analysis is based on, the results and the sensibility analysis are presented together in table 3.

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| Table 3. Cost-benefit and scenarios | | | | |  |
|  | **PV Costs (USD)** | **PV Benefits**  **(USD)** | **Net Present Value (USD)** | **Cost-Benefit Ratio** | **Social IRR** |
| **Scenario 1-Baseline** |  |  |  |  |  |
|  |  |  |  |  |  |
| Subcomponent 1-HRM | 26.205.622,74 | 45.851.960,95 | 19.646.338,21 | 1.75 | 28% |
| Subcomponent 2-Accountability | 13.650.000 | 27.299.895,98 | 13.649.895,98 | 2,00 | 28% |
|  |  |  |  |  |  |
| Total | 39.971.109,59 | 73.797.182,54 | 33.826.072,95 | 1.85 | 28% |
| **Scenario 2-Conservative** |  |  |  |  |  |
|  |  |  |  |  |  |
| Subcomponent 1-HRM | 26.205.622,74 | 27.805.807,64 | 1.600.184,907 | 1.06 | 13% |
| Subcomponent 2-Accountability | 13.650.000 | 22.128.597,93 | 8.478.597,931 | 1.62 | 22% |
|  |  |  |  |  |  |
| Total | 39.971.109,59 | 50.325.747,61 | 10.354.638,03 | 1,26 | 17% |
| **Scenario 3-Favorable** |  |  |  |  |  |
|  |  |  |  |  |  |
| Subcomponent 1-HRM | 26.205.622,74 | 63.898.114,25 | 37.692.491,52 | 2.44 | 42% |
| Subcomponent 2-Accountability | 13.650.000 | 32.471.194,03 | 18.821.194,03 | 2.38 | 34% |
|  |  |  |  |  |  |
| Total | 39.971.109,59 | 97.268.617,47 | 57.297.507,88 | 2.43 | 39% |
|  |  |  |  |  |  |
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* 1. In the baseline scenario, all the subcomponents have a positive Net Present Value (NPV). However, the results are sensible to changes in the assumptions. Specifically, an elimination of 10% of the HR posts is assumed, as well a saving by efficiency improves in the Public Sector of 0,3%. In the Subcomponent 2 a social benefit rate of audits of 0,25% was assumed.
  2. HR system experts affirm that Organizations that automate their HCM processes through a self-service enabled HCMES can achieve a 10-20% headcount reduction in HR administration resources. In exceptional cases, this figure could be as high as 35%.[[17]](#footnote-17). In addition, having an integrated solution allows organizations to detect and identify payroll payment anomalies and to rectify these swiftly. Migrating from a payroll environment like GOJ’s to a single integrated (with HR) solution can realize between 1% and 3% savings in an organization’s annual pay bill[[18]](#footnote-18).
  3. In the baseline scenario, the cost benefit ratio for the program results 1.85. This means that a recovery of 1.85 dollars for each invested dollar is expected. The social IRR results 28%, a weighted mean of the subcomponents social IRR. The Accountability Systems Subcomponent shows the best result in the favourable scenarios while the HRM Subcomponent performs better in the conservative scenario.
  4. In the conservative scenario, where the eliminated posts in the HR sector are 5%, savings due to efficiency are 0,2%. The social benefit rate of audits is 0,2% the program presents a social IRR of 17%. This shows that even in unfavorable scenarios the program is still profitable.
  5. In the favorable scenario, where the eliminated posts in the HR sector are 15%, savings are 0,4% and the social benefit rate of audits is 0,3%. The program presents a social IRR of 39%. This suggests that the program has a great potential.
  6. As a final conclusion, can be establishing that the program has high social returns. Even in the most conservative scenarios is highly profitable, showing in the baseline scenario a cost-profit ratio of 1.85 dollars for each invested dollar, with a social IRR of 28%, greater than the 12% established by the Bank.

**References**

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**Singer, Konstantinidis, Roubik and Beffermann: “Does e-Procurement save the State money?” (2006)**

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**Auriol, “Corruption in Procurement and Public Purchase.” (2006). International Journal of Industrial Organization, Vol. 24, No. 5, pp. 867-885**

**Link: http://ideas.repec.org/p/ner/toulou/http--neeo.univ-tlse1.fr-1577-.html**

**Lafuente, “Public Employment and pay policy in Belize” (2013)**

**Link: http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=38061144**

1. HCEMS refers to an IT solution that can scale up and automate and integrate processes like payroll, performance reviews, and employee information such as professional experience, academic background, as well as demographic features in a single database for the entire public sector. [↑](#footnote-ref-1)
2. For FY2012/2013, there is a total a work force established of 117,125 personnel. 2013 Repeat PEFA. [↑](#footnote-ref-2)
3. SHRMD, located within the Ministry of Finance and Planning, consolidates HR functions previously assigned to different entities. [↑](#footnote-ref-3)
4. An instance of the AMANDA application is currently hosted by the National Environment and Planning Agency (NEPA). [↑](#footnote-ref-4)
5. This cost reduction is expected to be achieved by realizing economies of scale through the aggregation, standardization and centralization of common ‘back office’ corporate functions such as finance, human resources, payroll, IT, and procurement. [↑](#footnote-ref-5)
6. The Operating Model for the HRSSC will comprise a definition of policy and strategy, scope of services, processes, systems, volumes, operating hours, accountabilities and responsibilities, facilities and locations, structures and organizations, service performance standards and levels, funding, pricing and charging mechanisms. [↑](#footnote-ref-6)
7. As part of the GOJ space rationalization programme the government has identified a group of facilities that could be used to accommodate the HRSSC once they have been suitably refurbished. [↑](#footnote-ref-7)
8. To be financed with resources to be received from the European Commission. See footnote 1. [↑](#footnote-ref-8)
9. See GOJ’s new PFM-RAP, prepared with the support of the IMF Regional Technical Assistance Centre CARTAC. [↑](#footnote-ref-9)
10. This will be provided jointly for external and internal auditors, as well as Parliament´s technical staff. [↑](#footnote-ref-10)
11. It includes the Internal Audit Directorate at the Ministry of Finance and the Internal Audit Units of Ministries and Departments. [↑](#footnote-ref-11)
12. See Afonso, Romero and Monsalve (2013). [↑](#footnote-ref-12)
13. Lafuente, (2013), finds that Belize reduced the workforce in 9% in the decade of the 90. [↑](#footnote-ref-13)
14. Based on sensibility analysis the social IRR is 28% for the HRM subcomponent under this assumption. The IRR decreases to 20% if we assumed a rate of saving of 0,2% (where 0,1% is the minimum level at which the subcomponent is profitable). [↑](#footnote-ref-14)
15. See “Mejoramiento del sistema nacional de control para una gestión eficaz e íntegra” -Contraloría General de la República (2013). [↑](#footnote-ref-15)
16. See Singer et al. (2009) and Auriol (2006) for less conservative results. [↑](#footnote-ref-16)
17. Steven Lungley (2013). **Review of the Government of Jamaica’s plans to procure and install a**

    **Human Capital Management Enterprise Solution** [↑](#footnote-ref-17)
18. Steven Lungley (2013). **Review of the Government of Jamaica’s plans to procure and install a Human Capital Management Enterprise Solution** [↑](#footnote-ref-18)