

## **ECONOMIC ANALYSIS**

### **A. Introduction**

1. With a population of 436,330, Maldives is one of the smallest countries in Asia and the Pacific. Typical of a small island economy, Maldives has a narrow economic base and relies on imports to meet its consumption and investment needs. Its key export, fish processing, is geared to external markets. As a result, Maldives is highly dependent on trade, and its trade-to-gross domestic product ratio in 2017 was 150%.<sup>1</sup> Efficient trade facilitation is thus important to keep costs of trading low. Recent data shows that Maldives lags on trade facilitation performance indicators and has fallen behind in several rankings.<sup>2</sup> Several procedural and organizational bottlenecks hamper the efficient flow of trade transactions. These include (i) paper-based processes that cause delays and are human resource intensive; (ii) underutilization of existing information and communication technology (ICT) systems in some cross-border regulatory agencies (CBRAs); (iii) overlapping and excessive documentary requirements; (iv) a physical cargo inspection rate of 100%; (v) lengthy procedures, operational constraints, and limited infrastructure for the security screening of exports at Malé port and airport; and (vi) other internal procedural inefficiencies and duplicated processes within agencies. To address these bottlenecks, the project proposes a national single window (NSW) to establish and facilitate an efficient international trade environment by reducing delays and lowering costs associated with clearance of goods at the Maldivian borders, while maintaining the requisite controls and collection of levies, fees, duties and taxes, where applicable, on imports or exports.

### **B. Rationale**

2. The rationale for government involvement in the project is because of the high transaction costs from government processes, which negatively impact upon efficiencies of potential market participants. Public sector participation in providing an NSW platform is justified as the private sector is unlikely to invest in and coordinate such investment, at least initially. Consequently, the NSW operator will be a government or a state-owned entity. The operator may charge a fee to recover operation and maintenance (O&M) costs or O&M costs plus a part of the initial investment.<sup>3</sup> The proposed fee would thus be designed for cost recovery and not for profit.

### **C. Demand Analysis**

3. Demand of the project comes from trade transactions. Currently, documentation is required as well as stakeholder visits to agencies, and CBRAs require extensive documentation, including voluminous application forms, permits, identification cards, licenses-to-operate, receipts, order slips, and other certification. A business process analysis (BPA) report covering 11 CBRAs identified 49 processes that required 45 documents to be produced. For total trade in

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<sup>1</sup> World Bank. Open Data: Trade (% of GDP). <https://data.worldbank.org/indicator/NE.TRD.GNFS.ZS> (accessed 7 September 2018)

<sup>2</sup> Sector Assessment (Summary): Industry and Trade (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).

<sup>3</sup> Based on project Financial Analysis (FA) (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President), the investment will be financed by ADB—50% by loan and 50% by grant. The government will be responsible for the grant and counterpart funds during implementation, and likewise O&M cost during operation (paras. 7 and 8, FA).

Maldives, this amounted to a total of about 875,000 documents in 2016.<sup>4</sup> These documents are processed manually, with most of the procedures repetitive in nature and time-consuming to both agency staff and traders. Additionally, traders and other stakeholders pay for visits to CBRAs and spend time traveling to and queueing up at processing centers. Following introduction of the NSW system, the amount of paperwork and corresponding time spent in processing would be avoided, resulting in efficiency gains that would contribute to overall trade facilitation.

## **D. Alternatives Analysis**

4. There is no feasible alternative to the proposed NSW system. Alternative solutions include (i) a do-nothing scenario, (ii) implementation of full or partial coverage of CBRAs, and (iii) proposed system operation by the government or private sector. The government recognizes that a do-nothing scenario has become a costly alternative, as the capacity of CBRAs to handle trade transactions peaked as early as 2016. Responding with additional CBRA personnel and system resources fell short of coping with the growing number of trade transactions involving imports that supply the requirements of tourism, Maldives' primary industry, and to sustain the public demand for goods. The proposed NSW can be programmed to cover all CBRAs to maximize impact on trade facilitation and be most cost-effective.

## **E. Cost–Benefit Analysis**

### **1. General**

5. The economic analysis of the project was done in accordance with the Asian Development Bank (ADB) guidelines.<sup>5</sup> Because of significant uncertainties of many production and price variables identified in the analysis, a Monte Carlo risk simulation model was developed, with four inputs specified as random variables. The future benefits were weighed against the investment costs, with the economic performance measured by the economic internal rate of return (EIRR) and the economic net present value (ENPV) at the economic opportunity cost of capital of 9%. The analysis used the international price numeraire (in constant 2018 prices) over a 20-year period. The without-project scenario was represented by the current system, and the with-project scenario represented the introduction of an NSW system. For the purpose of cost-benefit analysis, it was assumed that the number of trade transactions in the with- and without-project scenarios remained the same as in 2016. The analysis did not assume incremental demand.

### **2. Project Costs**

6. The financial investment cost, excluding price contingency, taxes, and financing amounts to \$10.69 million.<sup>6</sup> The project's capital cost is distributed into traded and non-traded components and labor. The foreign cost is assumed to be 90% of the total cost. The unskilled labor component comprises 50% of the local cost. Taxes are 6% of the local cost and are excluded while calculating

<sup>4</sup> The BPA report was prepared by consultants commissioned by the Ministry of Economic Development (MED) and tasked to reengineer business processes for an NSW environment. The BPA was a preliminary action leading to the time release study being prepared under the MED. The BPA is largely based on actual survey and focus group discussions covering CBRAs, traders, and other project stakeholders (e.g., brokers, forwarders, and consignees). Government of Maldives, MED. 2017. *New Single Window Project, Business Process Analysis—Detailed Recommendations*. Malé.

<sup>5</sup> ADB. 2017. *Guidelines for the Economic Analysis of Projects*. Manila.

<sup>6</sup> Based on project Financial Analysis (accessible from the list of Linked Documents in Appendix 2), the total investment cost, in financial terms, amounts to \$11.99 million. Investment cost, in economic terms, excludes taxes, inflation and financing charges.

economic costs. Major project component costs, including ICT infrastructure and equipment are considered tradable and are converted using a shadow exchange rate factor (SERF) calculated at 1.056.<sup>7</sup> The non-tradable goods are converted at 1.0, and the shadow wage rate factor is 1.0 for skilled labor and 0.8 for unskilled labor.<sup>8</sup> Financial costs, based on 2018 prices, are converted to economic costs by applying shadow pricing. In economic terms, the cost is \$11.38 million after conversion at the effective shadow rate of 1.034.<sup>9</sup> The exchange rate used was \$1 = Rf15.41. Project implementation covers 3 years, following the implementation schedule applied in the financial analysis: construction (2019–2020), trial period (2021), and full operation (2022).

7. Annual O&M costs are derived from financial recurrent cost estimates for the project management unit and the operator of the NSW system, and include personnel salaries (comprising 36% of total O&M costs), hardware and software maintenance (62%), and other costs (2%). Maintenance of hardware and software is assumed at 10% of respective capital costs of ICT equipment and software. Salaries are based on average government wages for managerial and administrative positions for project management unit staff, and on ICT professional positions for operator staff. Miscellaneous expenses include transport and fuels, communication, and general administration. Economic O&M costs are converted from financial costs using the effective shadow conversion rate of 1.034. The total annual financial O&M cost is calculated at \$0.98 million, with the economic O&M cost at \$1.01 million.

### 3. Project Benefits

8. The NSW proposes the use of ICT for documentation procedures to either reduce or completely eliminate issuance of forms and permits, and to streamline operations through information sharing and improved coordination among CBRAs, traders, and other stakeholders. The main project benefits are time and resource savings. Benefits arise from streamlined business processes that reduce time spent in processing trade documents and their associated costs including reproduction, storage, archiving, filing and processing. Benefits are also derived from other avoided costs involving stakeholder transport and travel, and lost time to other productive endeavors and leisure. These resource savings are a source of project benefits.

9. The BPA report estimates that the change from manual to ICT systems would save time and resources spent documenting trade transactions, currently assessed at 875,000 annually (footnote 4). Processing these documents consumes about 30,000 person-days at CBRAs. The number of person-days used is linked to the volume of documents processed. Further, about 713,000 trader visits to CBRAs annually will result in over 56,000 person-days saved.<sup>10</sup>

10. Benefits are estimated by valuing the time and resource cost savings related to documents processing. With the NSW system in place, some of the costs attached to reproducing documents (e.g., printing, collating and packing) would be avoided. At the Maldives Customs Service (MCS),

<sup>7</sup> The SERF is based on available historical data for projects in Maldives. The SERF remained stable during 2013–2016, averaging 1.06; the SERF was 1.05 in 2013, 1.06 in 2014, and 1.07 in 2015–2016. The SERF is calculated at 1.056 based on 2017 import figures (\$1.89 million) and export figures (\$0.12 million). ADB. 2017. *Key Indicators for Asia and the Pacific 2017*. Manila.

<sup>8</sup> Unskilled labor will be required for the construction of building space for NSW infrastructure and offices for personnel, and the installation of ICT equipment. Labor is not scarce in Maldives, especially in the capital Malé, where the main NSW infrastructure will be installed. The national unemployment rate is reportedly 5.2%. ADB. 2017. *Key Indicators for Asia and the Pacific 2017*. Manila; and Government of Maldives, Ministry of Finance and Treasury, National Bureau of Statistics. 2016. *Statistical Pocketbook of Maldives 2016*. Malé.

<sup>9</sup> The effective SERF is 1.034, calculated as the ratio of economic cost to financial cost.

<sup>10</sup> The number of visits include those by other stakeholders for trade transactions.

as with the other CBRAs, the economic cost of printing alone is charged \$0.11 (Rf1.73) per average of 1.87 pages.<sup>11</sup> At 875,000 documents produced annually, this amounts to \$0.098 million in equivalent annual resource cost savings.

11. Processing the documents involves personnel to evaluate the forms' completeness and compliance to requirements. Processing 875,000 documents require about 30,000 person-days per year (footnote 4). In the analysis, this is valued in terms of the average daily wage of staff processors, which is currently at \$12.67 (Rf195) in economic terms.<sup>12</sup> Multiplying the wage rate by the number of person-days saved would result in \$0.380 million productivity gains at CBRAs.

12. Traders and other stakeholders visit CBRAs at the rate of 713,000 times per year. This is valued in terms of transport cost for each trip to a CBRA. The average transport fare per visit is calculated at \$2.70 in economic terms—the cost of hiring a taxi based on a 6–10-kilometer roundtrip journey in Malé. This is equivalent to the avoided cost of visiting a CBRA, which amounts to \$1.925 million annually. The time spent by traders during such visits involves time queueing, filling out forms, and paying fees, in addition to actual travel time. It is estimated that 56,000 person-days are consumed for these activities annually. This is valued at the minimum daily wage rate at \$10.68 in economic terms,<sup>13</sup> and would amount to \$0.598 million per year in equivalent time saved, which could be used for more economically productive tasks.

13. Other benefits include communication cost reduction, cargo release time savings, avoided costs correlating to nontransparent procedures or corrupt practices, and avoided documents storage and archiving costs. These costs have not been quantified in the analysis.

14. As the population increases at 3.5% annually,<sup>14</sup> so too does the demand for imported goods and the corresponding trade documentation activities. In the analysis, under the without-project scenario, these activities will have reached peak personnel capacity in 2017–2018 at CBRAs, particularly in the MCS. New transaction volumes will require additional resources, resulting in further time and resource savings. The NSW system will replace the need for new resources. Thus, project benefits identified are a lower-bound estimate.<sup>15</sup>

#### 4. Estimation and Results

15. Analysis of the effects of varying individual benefits and cost input parameters was used to determine key risks to the project economic analysis.<sup>16</sup> Sensitivity analysis was conducted and switching values were computed.<sup>17</sup> It was found that project benefits are relatively sensitive to changes in the fare and delays in project benefits, with the EIRR dropping to 9% if the fare is decreased from \$1.49 to \$0.78, or if the project benefits are delayed by 2 years. However, the project is not sensitive to changes in capital costs unless they increase by 75%. While the results

<sup>11</sup> Based on 2017 MCS customs charges and fees collected for customs documents and services. The per-page fee for printing customs forms is Rf1.00; this was converted into the economic price of Rf0.93 (\$0.06).

<sup>12</sup> Reported by MED in August 2018. Based on average annual salary of government staff engaged in records section involved in filing and documentation at MVR 89,811, or MVR 200 per day, and converted into economic price using Shadow Wage Rate Factor for unskilled labor.

<sup>13</sup> Based on Maldives' Household Income and Expenditure Survey 2016 on annual minimum wage of \$3,137, converted to economic prices for unskilled labor.

<sup>14</sup> Household Income and Expenditure Survey 2016, National Bureau of Statistics.

<sup>14</sup> Household Income and Expenditure Survey 2016, National Bureau of Statistics.

<sup>15</sup> The import level is assumed to be constant from 2018 onward.

<sup>16</sup> Triangular probability distribution parameters were specified for each of the project's random variables and the simulation model was solved for 3,000 iterations.

<sup>17</sup> All uncertainties in project inputs are captured in the probability distributions.

were not sensitive to individual changes to production costs per page and salaries of CBRA staff and traders, reduced parameter values for these inputs combined resulted in an EIRR below the threshold. The simulation model was consequently solved for all these inputs specified as random variables, with the risk model deriving the statistical mean, standard deviation, and percentiles of the EIRR and ENPV. The EIRR of 13.6% and ENPV of \$3.57 million indicate that the project is economically viable. The simulated EIRRs ranged from 4.96% (fifth percentile) to 21.07% (95th percentile). The simulation model indicated there was less than a 15% probability that the project would not achieve ADB's economic opportunity cost of capital of 9%. The annual cash flows resulting from baseline (most likely) values are in the table.

**Mean Annual Cash Flows**  
(\$ million)

Year	Benefits					Costs			Net Cashflow
	Total	Resource Savings from Documents	Travel Cost Savings	Productivity Gains at CBRAs	Productivity Gains to Traders	Total	Capital	O&M	
2019	0.00	0.00	0.00	0.00	0.00	5.53	5.53	0.00	(5.86)
2020	0.00	0.00	0.00	0.00	0.00	5.53	5.53	0.00	(5.86)
2021	2.40	0.08	1.54	0.30	0.48	0.81	0.00	0.81	1.59
2022-2038	3.00	0.10	1.92	0.38	0.60	1.01	0.00	1.01	1.99

(-) = negative, CBRA = cross-border regulatory agency, O&M = operation and maintenance.

Source: Asian Development Bank estimates.

## F. Distribution Analysis

16. The distribution of project gains and losses is determined for the different project beneficiaries including the government, CBRAs, traders, and skilled and unskilled labor. The proportion of benefits to the poor is indicated by the poverty impact ratio (PIR). Based on the government's targets of (i) a minimum 50% of expenditures reaching the poor, (ii) labor participation of the poor in the project at 50%, and (iii) combined personnel at CBRA and traders and stakeholders comprising about 5% impoverished, the resulting PIR indicates that 25% of the \$36.00 million in total economic benefits, or \$9.07 million, will reach the poor. With the poverty rate in Maldives below 7%,<sup>18</sup> the project will have a positive poverty alleviation impact.

## G. Financial Sustainability

17. Based on the financial analysis<sup>19</sup>, the project would be sustainable under two possible scenarios: (i) fees are charged to recover initial setup and O&M costs; and (ii) fees are charged to recover only O&M costs. Proposed fees under (i) are \$10.08 per import declaration and \$6.50 per export declaration, with financial rate of return (FIRR) of 6.97%. Under (ii), fees are \$4.88 and \$3.25, respectively, with FIRR of 7.52%. Both surpass the weighted average cost of capital of 2.86%.

<sup>18</sup> Maldives' poverty headcount was 10% in 2002 and 7% in 2009. World Bank. Open Data: Poverty headcount ratio at \$1.90 a day (2011 PPP) (% of population). <https://data.worldbank.org/indicator/SI.POV.DDAY> (accessed 11 December 2018).

<sup>19</sup> Financial Analysis (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).