



Project Completion Report

PCR

Project Name	North Coast Highway Improvement Project
Country:	Jamaica
Sector/Subsector:	Transportation/Major Highways
Original Project Team:	Jacob Greenstain (RE3/FI3); James Campbell (COF/CJA); Valnora Leisler (LEG/OPR); Claudia Perazza (RE3/EN3); Peter Zoll, Roberto Manrique (RE3/FI3); Dora Currea (EVP); Edward Farnworth (COF/CJA) and María Rumbaitis (consultant).
Project Number:	JA-0044
Loan Number (s):	972/OC-JA
QRR Date:	June 15, 2010
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PCR Team: Principal Author and Members: Brian McNish (TSP/CJA); Giovanna Mahfouz (INE/TSP) and Kevin St Croix Morrison (Consultant/CJA).

Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
ERR	Economic Rate of Return
EU	European Union
FY	Financial Year
GDP	Gross Domestic Product
GOJ	Government of Jamaica
IBRD	International Bank for Reconstruction and Development (World Bank)
IDB	Inter American Development Bank
IMF	International Monetary Fund
IRI	International Roughness Index
IRR	Internal Rate of Return
JPSCo	Jamaica Public Service Company
Km	Kilometers
mm	Millimeters
MLG&W	Ministry of Local Government & Works
MOA	Memorandum of Understanding
MoEH	Ministry of Environment and Housing
MoF	Ministry of Finance
NCHIP	Northern Coastal Highway Improvement Project
NPV	Net Present Value
NRCA	Natural Resources and Conservation
NWC	National Works Agency
PAP	Project affected Persons
PAU	Project Administration Unit
PEU	Project Execution Unit
PPMR	Project Performance Monitoring Report
SIA	Sangster International Airport
TAP	Tourism Action Plan
TEF	Tourism Enhancement Fund
TCPA	Town and Country Planning Act
VOC	Vehicle operating cost

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I. BASIC INFORMATION

BASIC DATA (AMOUNTS IN US\$)

PROJECT NO: <u>JA0044</u>	TITLE: Northern Coastal Highway Improvement Project
Borrower: JAMAICA	Date of Board Approval: 26 Nov 1996
Executing Agency (EA): MINISTRY OF LOCAL GOVERNMENT AND WORKS	Date of Loan Contract Effectiveness: 31 Mar 1997
Loan(s):	Date of Eligibility for First Disbursement: 29 Sep 1998
Sector: TRANSPORTATION	1) Months in Execution
Lending Instrument: Investment/Specific Investment Operation	* from Approval: 143
	* from Contract Effectiveness: 138
	Disbursement Periods
	Original Date of Final Disbursement: 31 Mar 2002
	Current Date of Final Disbursement: 30 Sep 2009
	Cumulative Extension (Months): 90
	Loan Amount(s)
	* Original Amount: 59,500,000
	* Current Amount: 59,500,000
	* Pari Passu (if applicable): 70:30 – Bank: Local
Poverty Targeted Investment (PTI): Yes/No	Disbursements
Social Equity (SEQ): Yes/No	* Amount to date: 59,082,869 (%) 99.3
Environmental Classification: A, B, or C	Total Project Cost (Original Estimate): 85,000,000
	Redirectioning
	Has this Project?
	Received funds from another Project []
	Sent funds to another Project []
	N/A [x]
	On Alert Status
	Is project currently designated "on alert" by PAIS: Yes/No
	If yes then why is the project on alert (DO , IP Ratings and/or relevant PAIS indicators):
	Comments on relevance of "on alert" status for this project (if applicable):

Summary Performance Ratings				
DO	[] Highly Probable (HP)	[X] Probable (P)	[] Low Probability (LP)	[] Improbable (I)
IP	[] Very Satisfactory (VS)	[X] Satisfactory (S)	[] Unsatisfactory (US)	[] Very Unsatisfactory (VU)
SU	[] Highly Probable (HP)	[X] Probable (P)	[] Low Probability (LP)	[] Improbable (I)

II. THE PROJECT

A. Project Context

- 2.1 The North Coast Highway Improvement Project (NCHIP) (LO-972/OC-JA) was developed and designed between 1994 – 1996 against the socio-economic backdrop of a contracting Jamaican economy which was largely dependent on bauxite, alumina and tourism. This economic contraction was preceded by a post independence decade (1962 - 1973) which realized growth rates of 5 per cent but which plummeted and

reached 1.6 per cent in the early 1990's mainly because of a slump in the demand for bauxite and alumina.

- 2.2 To address this economic decline, the Government of Jamaica (GOJ) sensibly embarked on a response strategy of revitalizing the tourism sector and commissioned the elaboration of a Tourism Action Plan (TAP) with the objective of diagnosing the gaps in the sector impeding sustained growth. A slew of North Coast (tourism belt) Improvement infrastructure Projects that would engender high tourism productivity growth, were born out of this process of which the development of the NCHIP from Negril to Port Antonio was identified as an important first step as it directly impacted the lives of approximately 500,000 individuals and assisted in connecting the two largest cities in the country Ocho Rios to Kingston via the Bog Walk Gorge. This investment therefore provided endless possibilities with regard to; movement of people, goods and services in the domestic economy and was therefore viewed by the Government during the design period of this operation as critical to the country's economic development effectively linking the tourist belt to the rest of the country.
- 2.3 Accordingly, the Overseas Economic Cooperation Fund of Japan (OECF) the Inter-American Development Bank (IDB), and the European Union (EU) were originally approached for financing and a decade later the Caribbean Development Bank (CDB) was approached when it became evident that more resources were required to be injected to complete the project. Collectively, the IFIs channeled their resources into over 270km (168 miles) of roadway divided into three (3) segments with each IFI financing a different segment. Segment 1 covering 71 km from Negril to Montego Bay was funded by the OECF Segment 3 consists of 92 km from Ocho Rios to Port Antonio, was funded by the EU and Segment #2, 97km from Montego Bay to Ocho Rios was to be fully funded by the IDB¹.
- 2.4 Accordingly, on November 26, 2007 the Bank approved the investment loan 972/OC-JA in the amount of US\$59.5 million, (70% of project cost) for a scope of works consisting of the construction of 97km of highway with a total project cost of US\$85 million. The period of disbursement was 60 months with a final disbursement date of disbursement established as March 31, 2002. However, following a comprehensive rescoping exercise that was effected on October 12, 2006 through an amendatory contract the scope of the US\$59.5 (60% of revised project cost) loan was revised downward to 70km, the revised total project cost was established at US\$99.7 million, and the date of final disbursement revised to December 31, 2008. The final disbursement of the loan was actually realized on September 30, 2009, nine month over its revised terminal disbursement date.

¹ At the time of project design 1995 Segment 2 consisted of 97 km in aggregate from Montego Bay to Ocho Rios comprised four sections:

Section#1 (27km Montego Bay to Bougate),
Section#2 (28km from Greenside to Bengal Bridge),
Section#3 (20.3 km from Bengal Bridge to Salem) and
Section#4 (21.7km from Salem to Ocho Rios)

However Section#1 was excised from the scope of the IDB operation and later funded by the CDB following a rescoping exercise and an amendatory loan contract in 2006.

- 2.5 Notwithstanding, the total term of execution of the project was eleven years and six months between (Mar 1998 – Sept 2009). This period of implementation was characterized by an economy carrying a very high public debt (125 per cent of GDP) and which continued to contract due to a lack of robust fiscal control, exacerbated by its vulnerability to external shocks of 9/11 in 2001, and natural disasters (hurricanes Ivan 2002, Dean 2007 and Gustav 2008) which contributed to creating a counterpart funding shortfall throughout the life of the project.
- 2.6 In addition to the counterpart funding shortfall, project execution was also blemished by a lack of inter-agency coordination, as project execution was delayed for some time due to the protracted relocation of utilities and squatters within the construction right-of-way. Execution was also delayed due to the increase in work quantities with attendant variations and cost overruns as additional ancillary works to towns and village roads not originally envisioned were included in the project. The contractor's capacity and wanting performance and management of the project also contributed to delaying execution of the project as the contractor experienced prolonged financial difficulties and eventually had to be bailout by the GoJ through a Memorandum of Agreement (MOA) with the contractor.
- 2.7 The MOA also conspired to mar Bank/Client relations, during the term of execution as the Bank incorrectly determined that the term and conditions of the MOA were inconsistent with the provisions of the loan contract and made a decision to suspending disbursements. This decision served to stifle project resources, hurting the cash flow of Government in an economic climate of tight liquidity and in hindsight unnecessarily delayed the project by almost 2 years.
- 2.8 In an effort to arrest its quickly eroding reputational equity the Bank initiated an independent evaluation of the MOA, which concluded that the Bank was wrong and that the MOA was appropriate. The Bank accepted the evaluation and endorsed all contract variations and higher unit prices of the MOA as evidence by the fact that the Bank eventually incorporated the MOA into an amendatory loan contract - revising the scope of works from 97km to 70km¹ and reimbursed the Client for the expenditures made during the term of suspended disbursement.
- 2.9 Note worthy was that the tenor of Bank/Client relations appeared to have been defined early in the life of the project when pursuant to hiring the main contractor for the project the Bank rejected the recommendation of the Client to award the works to the lowest evaluated bidder following an issue of establishing nationality requiring an opinion which was endorsed by the Attorney General. Instead, the Bank following its own analysis advised that the award be made to a company at odds with the client. This decision came with the attendant embarrassment to the Client and higher financial cost as the lowest evaluated bid was not retained.
- 2.10 Notwithstanding, the aggregate delays and the strained business relations overall, NCHIP achieved its major specified outputs and was awarded the Outstanding Civil Engineering Achievement Award see Annex IV.

B. Project Description

- 2.11 The North Coast Highway Improvement Project was essentially a five year program of investments in civil works to rationalize and improve 97km of coastal road together with investments to sustainably maintain the road and to minimize the negative environmental and social impacts.

1. Development Objective

- 2.12 The overall objective of the NCHIP was to reduce overall road transportation costs along the route, improve vehicular and pedestrian safety, and alleviate congestion. By so doing, it would contribute towards attaining one of the country's primary objectives – to provide the physical infrastructure to diversify Jamaica's economy through tourism promotion and thereby provide foreign exchange reserves required to support economic development. The Project was also expected to ensure maintenance of the local socio-economic and ecological balance. The project specific development objectives were:
1. Road user costs along Segment 2 of the highway reduced and right of way cleared of all dwellings and structures
 2. International Roughness Index (IRI) reduced from 1996 (7500 mm/km) value to current NWA standards for Class A roads by December 31 2008 (2500 mm/km)
 3. Travel time from Greenside to Ocho Rios reduced from 2½ hours to approximately one hour by December 31 2008
 4. All Project Affected Persons (PAP) with dwellings, commercial structures or obstructions in Right of Way for 70 kilometers² of rehabilitated road to be settled/removed by December 31, 2008

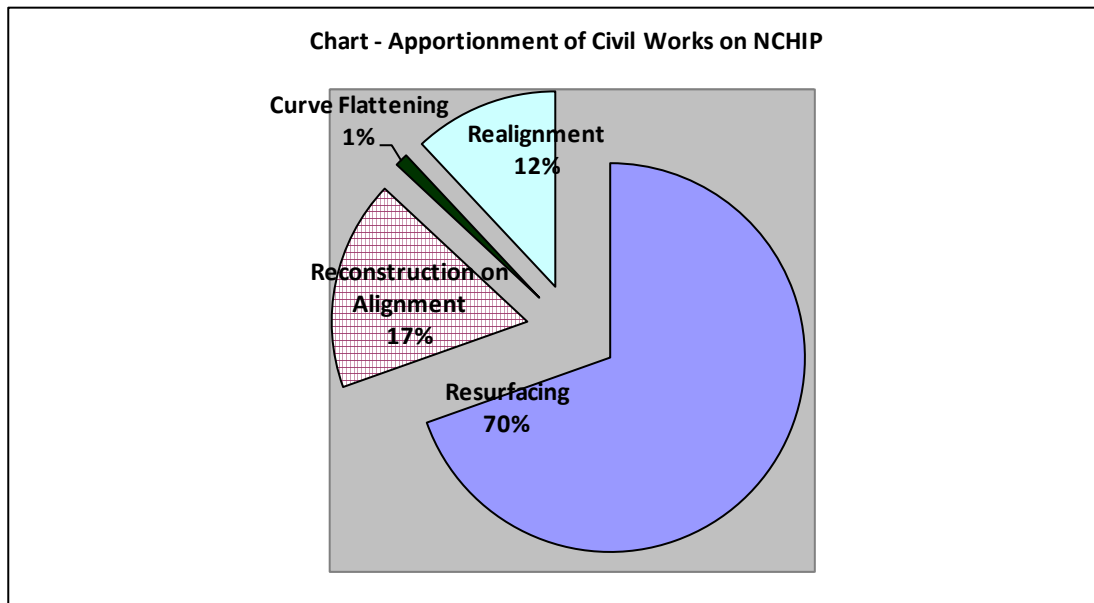
COMPONENT 1. CIVIL WORKS COMPONENT:

- 2.13 Under this component overall designs ensured that the road allowed a safe traveling speed at 55 mph (88 km/h) in unrestricted areas declining to 35 mph (56 km/h) or less through townships and other restricted zones. Civil works also comprised of:
1. **Resurfacing (64km)** - It included the widening of pavement and shoulders, and the digging of ditches, clear zone grading and improvement of drainage. Resurfacing was also done in urban areas where other improvements would be disruptive. This included; pavement widening, the construction of sidewalks and improvements to drainage works.
 2. **Reconstruction on Alignment (16 km)** - Reconstruction on existing alignment performed where pavement conditions are caused by damaged base course or poor sub-grade conditions.
 3. **Curve Flattening (1km)** – This was applied in areas where the existing alignment did not meet design speed requirements.
 4. **Realignment (11km)** - Occurred principally outside the existing right of way and replaced sections of the Highway that either ran through congested urban areas or

² Due to the fact that Section 1 of the road was given to another contractor late in the implementation stage of the project the indicators speak to 70 kilometres instead of 96.7 kilometres

that had numerous sharp curves that could not otherwise be brought near to design criteria.

Apportionment of the civil works contract (by length of road in km) is show below in Chart.



COMPONENT 2. ENVIRONMENTAL PROTECTION AND RESETTLEMENT COMPONENT:

2.14 The NCHIP was expected to have certain environmental impacts as well as the social dislocation of 435 dwellings from the right of way. The Bank had at the outset sponsored several studies to ensure mitigation of negative impacts viz:

- Selection of optimal alternative realignments;
- Agreements were done with the Jamaica National Heritage Trust (JNHT) to evaluate possible sites of historic or archaeological importance and design corresponding protective actions ;
- There were incorporations of general, specific and site-specific environmental mitigation measures into the contract tendering documents;
- There was the design of an environmental monitoring plan;
- There existed special measures to protect scarce forest lands from further degradation;
- Training and other assistance to the then NRCA was provided; and
- A detailed program to resettle families affected by physical degradation along the Highway was planned and carried out

COMPONENT 3. ROUTINE MAINTENANCE COMPONENT

2.15 The Project included a pilot program for maintaining the works once completed. At the time of design, the Jamaican road system was characterized by deficient maintenance administration causing the need for periodic and costly road rehabilitation. The pilot program had been designed to overcome the key obstacles to effective road maintenance: inadequate and unreliable funding, and a management and professional structure within the MLG&W depleted by repeated organizational restructuring.

III. RESULTS

A. Outcomes

Loan Outcomes: The actual outcomes from the NCIHP are shown in the table below, which demonstrates that the project has achieved its objective of reducing overall road transportation cost and has alleviated congestion since travel time along the route was reduced and vehicle wear and tear has been reduced given the reduce roughness index.

OUTCOMES FROM THE NCIHP

ACHIEVEMENT OF DEVELOPMENT OBJECTIVES (DO)			
Development Objective(s) To reduce overall road transportation costs along the route, improve vehicular and pedestrian safety, and alleviate congestion. and right of way cleared of all dwellings and structures.		Key Outcome Indicators : <ul style="list-style-type: none">IRI Reduced from 7500 mm to 2500mm by December 31 2008.Travel time from Greenside to Ocho Rios reduced from 2 1/2hrs to 1 hr100% of project affected persons (pap) resettled by December 31 2008	
Classification: HP,P,LP,I			
Planned Outcomes		Outcomes Achieved	
1.1. Description: IRI reduced from 1996 value to current NWA standards for Class A roads by December 31, 2008 Unit: mm/km Baseline Target 7500mm/km(26 Nov 1996) EOP Target 2500mm/km (30/06/2009)		2500mm/km (7/12/2008)	
1.2. Description: Travel time from Greenside to Ocho Rios reduced from two and a half hours to approximately one hour by Dec 31, 2008 Unit: hour Baseline Target 2.50 hrs (26 Nov 1996) EOP Target 1hrs (30/06/2009)		1hr (30 Mar 2007)	
1.3 Description: No. of Project Affected Persons (PAP) with dwellings, commercial structures or obstructions in ROW for 70 kilometers of rehabilitated road to be resettled/removed by December 31, 2008. Unit: p.a.p. Baseline Target 226 (31 Dec 1999) EOP Target 435 (30/06/2009)		435 (29/12/2006)	
Reformulation. [X] N/A			

PPMR Retrofitting.			
[X] N/A			
Summary Development Objective(s) Classification (DO):			
[] Highly Probable (HP)	[X] Probable (P)	[] Low Probability (LP)	[] Improbable (I)
<p>Briefly justify DO classification, based on degree to which planned targets were met, explaining the differences between planned and achieved outcomes as well as any other relevant factors. Include references to evidence that can support these results.</p> <p>The developmental objective classification of probable is justified on the strength of the outcome indicators which show that the major objective and purpose of the operation has been achieved ie the overall transportation cost has been reduced since both the roughness index and travel time has been reduced and have met their targets. Therefore with no insurmountable risk it's probable to conclude that the project will achieve its developmental objective.</p>			
<p>Country Strategy. Given the results described above, briefly discuss how the project contributed to the Bank's strategy in the country.</p> <p>The Bank's strategy as proposed to the Board in September 1995 focused on four primary objectives:</p> <ul style="list-style-type: none"> (a) Consolidating the structural transformation of the Jamaica economy, focusing on the rationalization of the state as a key element in achieving fiscal stability and increased overall economic efficiency; (b) Improving the sustainability and quality of social services; (c) Reducing poverty and conserving the environment and (d) Promoting more rapid export growth. <p>The results achieved in reducing the travel time and roughness index on the road network in the tourism corridor will by extension reduce the transportation cost in the tourism belt and effectively promote more rapid export growth the fourth primary objective of the Bank's Country strategy.</p>			

B. Externalities

- 3.1 The most immediate short term benefit from the NCHIP, over the project implementation cycle, was employment creation. During the construction period alone between 650-900 jobs were produced and the estimated number of spin-off jobs created was between 850 and 1100.
- 3.2 The construction of the road also improved overall urban design and the management and administrative capacity of relevant central government institutions and local government authorities. Locally at least 40 km of alternate and feeder roads (not listed on the original project outputs) were paved. These included feeder roads in Duncans and Falmouth (Trelawny) and the Mt Rosser Main Road. These have improved both the service delivery and cost challenges of the Trelawny and St Ann Parish Councils. The road improvements did not just maintain existing road infrastructure but also preserved the towns that were bypassed.
- 3.3 With regards to institutional strengthening of central government entities; before segment 2 of the NCHIP, organizations such as NEPA, (then NRCA), the NWA and JNHT did not have the institutional capacity that they currently do to carry out large projects. For instance the concept and application of the process of an environmental monitoring plan was perfected under the NCHIP Segment 2. All these and other institutions are now way up the learning curve on these and similar processes as they proceed to carry out other projects of a similar nature islandwide.
- 3.4 There were short term negative externalities such as high levels of pollution and periodic lack of environmental safety during the construction phase of the project.

Project environmental reports show that there were challenges in managing air and water quality during the duration of the project at some construction sites. Challenges with fugitive dusts and respiratory particles were experienced by residents and with regard to water quality; reports show that fecal coliform, BOD and nitrate levels were higher than desired at Pear Tree Bottom.³ These incidents however saw the stakeholders immediately implementing amelioration and mitigation strategies and negative effects seemed to cease after major construction activities.

C. Outputs

The outputs from the NCHIP are shown in table below

IMPLEMENTATION PROGRESS (IP)			
Components (Outputs):			
1. Component 1: Environmental Mitigation and Resettlement			
IDB: US\$ 1,228,483.14 - [LP US\$1,400,000.]			
IDB Disbursement: 100%			
Classification: HS, S, U, VU			
Key Output Indicators:			
1. Percentage of environmental mitigation measures implemented.			
2. Number of families removed and relocated elsewhere.			
Planned Outputs		Outputs Achieved	
Baseline*	End of Project		
1.1 B 0% (20/05/1997)	1.1E 100% (30/06/2009)	1.1 100% (30/06/2009)	
1.2 B 0 (20/05/1997)	1.2E 435 (30/06/2009)	1.2 435 (29/12/2006)	
Briefly explain differences between planned and actual outputs (if applicable).			
[X] N/A			
Restructuring. Indicate if this component was restructured (date of approval by Manager). Briefly discuss the consequences of these changes.			
[X] N/A			
2. Component 2 Pilot Road Maintenance			
IDB: US\$2,205,183.62 [LP US\$2,400,000.00]			
IDB Disbursement: 100%			
Classification: HS, S, U, VU			
Key Output Indicators: Percentage of road maintenance measured in place.			
Planned Outputs		Outputs Achieved	
Baseline*	End o Project	End of Project	
2.1B 0% (20/05/1997)	2.1E 100% (30/06/2009)	2.1 100% (30/06/2009)	
Briefly explain differences between planned and actual outputs (if applicable).			
[x] N/A			
Restructuring. Indicate if this component was restructured (date of approval by Manager). Briefly discuss the consequences of these changes.			
[X] N/A			
(In case of more components, create new row and complete.)			

³ Environmental Report February 2003

2. Component 3 Civil Works IDB: US\$52,708,665.81 [LP US\$50,500,000.00] IDB Disbursement: 100% Classification: HS, S , U, VU		
Key Output Indicators: 3. 97km of road between Greenside and Ocho Rios improved to GOJ class A1 Roads Standards		
<u>Baseline*</u> 3.1B__ 0km (20/05/1997)	<u>End of Project</u> 3.1E 97km (30/06/2009)	<u>Outputs Achieved</u> <u>End of Project</u> 3.1 97km (30/03/2007)
Briefly explain differences between planned and actual outputs (if applicable). [X] N/A		
Restructuring. Indicate if this component was restructured Briefly discuss the consequences of these changes. [X]		
Summary Implementation Progress Classification: [] Highly Satisfactory (HS) [X] Satisfactory (S) [] Unsatisfactory(U) [] Very Unsatisfactory (VU)		

D. Project Costs

CATEGORY	Total Project Cost - Planned Original (US\$000)		Total Project Cost Amended (US\$000)		Total Project Cost - Actual (US\$000)		% Difference
	BANK	GOJ	BANK	GOJ	BANK	GOJ	
1. CIVIL WORK	43,200	11,700	50,500	34,980	52,709	34,980	2,209
2. ENVIRONMENTAL AND SOCIAL MITIGATION	6,400	5,400	1,400	1,501	1,228	1,501	(172)
3. ROAD MAINTENANCE	2,400	200	2,400	122	2,205	122	(195)
4. FINANCIAL COST	2,200	400	3,095	3,637	2,500	3,637	(595)
5. UNALLOCATED EXPENSES	5,300	7,800	2,105	-	0.00	-	(2,105)
6. TOTAL	59,500	25,500	59,500	40,240	59.122	40,240	
	70%	30%	60%	40%			

Variation in the budget between the planned original and the amended, relate to an amendment of the loan contact to reflect an agreement to change the scope of works and the unit prices. Variation in the amended budget and the actual relate mainly to line items captioned Civil work which is explained by the construction variation orders during implementation of the works to cover works which were unforeseen. The increase in budget of Civil Works is related to a corresponding decrease in unallocated expensed.

US\$	Total	IDB	CDB	GoJ
(IDB) Original Loan Contract Estimated Total Cost (1996 Sect 1,2,3,4)	85,000,000	59,500,000	-	25,500,000
(IDB) Amended Loan Contract Estimated Total Cost (2006 Section 2,3,4)	99,740,462	59,500,000	-	40,240,462
Actual cost of construction Amended Loan Contract (2009 Section 2,3,4)	113,700,000	59,122,332	-	54,200,000
Actual Cost of construction CDB funded Section1	66,200,000		50,000,000	16,200,000

IV. PROJECT IMPLEMENTATION

A. Analysis of Critical Factors

- 4.1 A critical factor which affected implementation was the Bank's rejection of Government's recommendation to award to the lowest evaluated bidder. This effectively delayed the project, and eroded reputational equity of the Bank.
- 4.2 The lack of inter agency coordination delayed the relocation of utilities and the resettlement of household within the project right of way and was a critical factor which impacted on the implementation of the project.
- 4.3 Weakness in the contractor performance was central to the slow implementation of the project. The contractor after three years of implementation began to experience liquidity problems which served to slow construction progress.
- 4.4 Also critical to project implementation was Government's commitment to the project as evinced by their decision to assist the cash strapped contractor, increasing the contract amount, unit prices while decreasing the scope of works. This decision was pivotal in rescuing the project.
- 4.5 The Banks decision to suspend disbursements at a critical time served to significantly delay the project and was a critical factor in additional cost to the client through commitment fees and in developing discord in its relationship with the Bank.
- 4.6 The Banks decision to re-commence disbursements and negotiate an amendatory contract incorporating all elements of the Government rescue agreement with the Contractor was central to the completion of the major component of the operation.
- 4.7 The NCHIP experienced significant time delays and scope changes (especially on the civil works component) during its implementation cycle. What was an original 60 month project became an 11½ year exercise from contract effectiveness. The total time taken to complete the project was therefore more than double the original time frame.
- 4.8 ⁴The financial management of the project was generally good. The project accountant although competent was challenged by the absence of an automated accounting

⁴ Paragraph 4.8 represents the comments of PDP

system and adequate resources. Minor deficiencies in the system of internal control were identified by the Auditor General (External Auditors for the project) on an ongoing basis, however, the risks were manageable and management was responsive. The implementation of an improved financial information system was not fully realized during the life of the project. The executing Agency was unable to meet its financial reporting obligations on a timely basis as the Audited Financial Statements together with other financial reports were invariably submitted late. The fact that the automated accounting system was not implemented contributed to these delays.

- 4.9 The project experienced delays due to internal and external factors throughout the entire implementation cycle. At the start of the civil works component there were reported delays after contract award as another tenderer who was unsuccessful lodged a legal protest. This delayed the scheduled mobilization time. There was also some loan-contract conditions between the GOJ and the IDB which had to be fulfilled within 180 days of contract signing before initial disbursement – some of these conditions were not fulfilled within the required time. These include the detailed plan of work and also the project initial report. The late delivery was mainly a result of institutional challenges as some organizations had just been re-organized or even fully reconstituted (e.g. NEPA). The Bank therefore provided extensions for these conditions and other activities such as:
1. NRCA Institutional Strengthening – the Authority (now NEPA) was to provide a detailed management plan.
 2. Financing plan for maintenance activities
 3. The designation of the Coral Spring Dry Forest as a protected area
 4. The removal of utilities and relocation of affected persons
- 4.10 At the implementation phase all three components experienced challenges to the accomplishment of tasks. The civil works contract saw a situation where, at one point the Contractor was unable to finance works on the project. As a result all works on Section 1 of Segment 2 had to be demobilized and tendered separately to local contractors. The Ministry of Finance (MoF) also had to create a rescue package (March 2004) for assistance with the other three Sections which was signed in March 2005.
- 4.11 These issues were deemed pressing enough for the IDB in 2005 to hire a technical and financial consultancy to review the progress made to date on project execution. Reports in project files, midyear reports and other communication also spoke clearly to the Bank expressing displeasure with significant time variations, cost overruns and the slow rate of project production.
- 4.12 Closer examination of the reasons for such delays shows that there were changes to the original civil works component scope from that planned in 1996. For example, additional bypasses were put in which were deemed necessary by the project team such as Duncans and Rio Bueno – these were not in the original scope of work. In addition stakeholders state that at one point the original designs had a four lane road only from the city of Montego Bay to the Sangster's International Airport (SIA). It was deemed insufficient based on the projected AADT and further width extensions

were designed and implemented along the entire road length. The original asphalt thickness recommended was 1½ inches but due to the frequency of heavy articulated vehicles this was increased to four (4) inches. Note also that the original designs did not have as many right turning lanes as was deemed necessary and these had to be done which required a lot more earthworks and time than was originally budgeted. Other scope changes were also done (the IDB Mission of January 26-27 2006) to the civil works contract viz:

- Mammee Bay to Ocho Rios was overlaid instead of major reconstruction
- 18.9 km of kerb and gutter was taken out. Reduction in the amount of concrete gutters was reduced and replaced by extending asphalt pavement to kerb where applicable

4.13 With regard to the question of contractor performance on the civil works component, reports by stakeholders state that when a cost benefit analysis was done it would have been more costly to fire the single contractor as procurement of a new contractor in terms of time and cost would have cost the promoters of the project significantly more. There was also the need to extend the time for the supervisory consultants – who themselves were adjudged as being tardy in work supervision by the Bank and the executing agency. The Ministry of Finance was also undergoing fiscal restrictions at the time. This took time for them to provide their portion of the financing for the project and contributed significantly to the delays experienced. Numerous filed reports show that at crucial points of implementation counterpart funding was not available.

4.14 Challenges also occurred with regard to the environmental monitoring component.⁵ There was slow progress in the relocation process and also the removal of utilities and the purchase of properties along the development corridor. Stakeholders stated that these time variations could not be helped as removal can only be done by the owners of the utilities i.e. Jamaica Public Service Company Ltd (JPSCO) and the National Water Commission (NWC).

B. Borrower/Executing Agency Performance

Borrower/Executing Agency			
<input type="checkbox"/> Highly Satisfactory (HS)	<input type="checkbox"/> Satisfactory (S)	<input checked="" type="checkbox"/> Unsatisfactory (U)	<input type="checkbox"/> Very Unsatisfactory (VU)

4.15 Examination of documents and discussions show that the borrower and executing agency had the required management structure with regard to technical skills and project experience to undertake the NCHIP. The requirements of the project were also well defined in the Project Initial Report. Project designs and other planning documents perused show that there was a clear process in place to properly undertake the NCHIP. The Borrower/Executing agency also stated that in the national interest

⁵ Questions were being asked by the Bank regarding the enforcement of the Environmental Management Plan for the project and also the role of Stanley Consultants as 46,000 cubic m of crushed rock was creating a hazard to residents who had exhibited frustration in writing to stakeholders including the Bank and the NWA

they did exceed the work scope as set out in the original plans of 1996 and went far beyond what was required and this created significant time variations.

4.16 There were however some circumstances which were beyond the executing agency's control such as the slow rate of budgetary financing from the central government coffers. There were, on the other hand, critical issues the NWA should have been more stringent about, viz:

1. Greater need for respect and regard for time – evidence from files shows that the Bank required the setting of realistic timeframes by both the Contractor and the Executing Agency. The time frame lapses created an increase in costs of approximately 120 per cent.
2. Monitoring of supplier/contractor performance
3. Time cost and budgeting issues – audits at one point were over seven months late.
4. Improvements required with regard to inter-agency co-ordination – more pressure may have been needed to be exerted on the then NRCA, the Jamaica Public Service (JPS) and the National Water Commission (NWC). These assisted in contributing to an increase in the disbursement period to 300 per cent
5. Stronger overall project monitoring tools as per performance framework – simple things such as the implementation of a proper accounting system

C. Bank Performance

Bank Performance			
<input type="checkbox"/> Highly Satisfactory (HS)	<input checked="" type="checkbox"/> Satisfactory (S)	<input type="checkbox"/> Unsatisfactory (U)	<input type="checkbox"/> Very Unsatisfactory (VU)

4.17 The feedback given by representatives of the NWA and other stakeholders is that the IDB in planning the project did not fully take into consideration two (2) major issues:

1. Project costs – in dealing with a road project of this nature, project costs must include utility removal. In this case an additional 25 per cent of total project cost was required for water and another 10 percent allocated to transfer and repairs to electricity mains.
2. The original time period for original construction was unrealistic. Approximately five years is required for construction for a project of this nature, not the 32 months originally intended.

4.18 Another issue that were stated in relation to this was the perceived lack of consensus in the making of critical decisions such as the IDB mission of 2005 that made design changes which some local technocrats did not agree and which lead to an unnecessary hiatus on the project.

V. SUSTAINABILITY

A. Analysis of Critical Factors

- 5.1 Central to sustainability is maintenance of the road investment. The maintenance of the NCHIP fall under the purview of National Works Agency who have been training and provided with new cutting edge tools and system for the maintenance of roads. In additions a Roads Maintenance Fund has been established with dedicated funding for the maintenance of roads. Attempts are now being made to manage traffic and fully incorporated the present traffic motion sensor system of the NWA together with a vehicle weighting system. Another initiative which is currently being implemented is the: **Adopt a Roadway Programme** – this is now in effect in north Montego Bay where hotels are contributing to routine maintenance of the road. This is also supported by the Tourism Enhancement Fund.
- 5.2 At the start of the project the evidenced presented was that the project would be sustainable over time as evidenced by the Economic Rate of Return (ERR). It was estimated that the rate of return over time on resources employed would be 37 per cent with a positive NPV for the entire Segment. The details are shown below in the table. At the start of the project the evidenced presented was that the project would be sustainable over time as evidenced by the Economic Rate of Return (ERR). It was estimated that the rate of return over time on resources employed would be 37 per cent with a positive NPV for the entire Segment. The details are shown below in the table.

Section	Pre-Project Projections		Post Project Estimates	
	ERR	NPV	ERR	NPV
Montego Bay – Falmouth	34.94	63.72	17.12	39.11
Falmouth – Discovery Bay	33.31	47.13	14.54	24.81
Discovery Bay – St Ann	45.59	43.36	26.77	34.07
St Ann’s Bay – Ocho Rios	45.62	29.20	33.11	39.85
TOTAL	37.39	183.83	22.91	137.84

Source NCHIP PCR – IDB 2010

- 5.3 Current data to date shows an actual ex-post economic IRR of 22 per cent for the entire project and an NPV of 137.84.6 The reduced ERR may be a result of the time losses on project delivery as time losses were at approximately three times what was originally projected; inflationary movements over the 11 years of implementation; and the attendant increase in project cost by at least 33 per cent over the project

⁶ Note that there may be an apples and oranges phenomenon here as no evidence is available with regard to the approach that was used in calculating the project projections. The post project estimates is an economic estimate which estimated the sustainability based on; [a] the length of each section, [b] life valuation model, [c] productivity – using GNP per capita as a proxy and [d] the current estimates of a road toll for each section. Note also that safety and accident data was not available from the Road Safety Unit as requested. The higher the level of accidents the lower the life valuations and also the higher the decrease in the rate of return on the investment.

period created an obvious decrease in the rates of return⁷. Crude estimates show that the country may have lost approximately US\$40 million dollars in expected productivity improvements alone due to time lapses. Notwithstanding this the project still remains a feasible one with strong expected financial and economic benefits in the future.

- 5.4 These are all critical issues to cost recovery and sustainability. Studies have shown that in 2008 required annual recurrent maintenance expenditure for Class A roads in Jamaica was approximately one half million Jamaican dollars per kilometer.

B. Potential Risks

- 5.5 The expected life of the NCHIP currently may be shortened if the required schedule for routine and periodic maintenance is not followed. Studies show that this segment of highway carries the highest number of 3+ axle and articulated vehicles as it is a major route to Kingston. If proper measures are not put in place this can create a high rate of deterioration in the investment and higher rates of accidents and antisocial behavior by road users. There is also the risk that a strong environmental and planning system is not enforced which forces degradation of areas e.g. the Coral Spring Dry Forest and also renewed attempts at squatting on lands adjacent to the highway. There are other secondary risks to be cognizant of such as:

- Technical Risks - the designs and material used will create greater accident rates and/or there are no serious enforcement rules (e.g. monitoring and policing of the road and the strategic placement of traffic lights).
- Environmental Development Risks – the advent of the road may create development and socio-economic challenges to the management and sustainability of small neighboring towns. The advent of bypasses may decrease business activity for these small municipalities and lack of local income can trigger downward development spirals.
- Organizational and Management Challenges – the possibility that the expectations of the Public Sector Modernization Programme (of which the NWA and the MT&W and MLG are a part) are not fully realized.

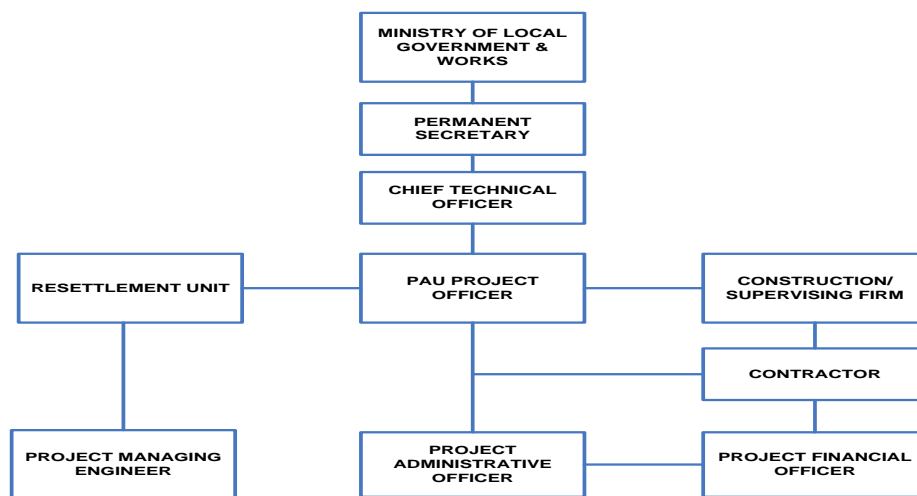
C. Institutional Capacity

- 5.6 Throughout the life of the project the relevant government machinery was fully employed in project planning, design and implementation. A great deal of this machinery is still in place for maintenance.
- **Legal Framework** – land was acquired under the Land Acquisition Act (1947) and the institution responsible was the Commissioner of Lands and only those PAPs with titles were originally slated to be compensated. Environmental management was to be enforced using the Natural Resources and Conservation

⁷ The economic life of the road was surpassed before the project ended i.e. 7 years (this is the time estimated for the half life of asphalt). In assessing the toll rate (these were the economic estimates of revenue) the full returns of the road were not achieved within the seven years. During this period at no time was the full productivity potential of the road experienced. Hence a decrease in revenues which in turn decreases ERR.

(NRCA) Act (1991) and development standards by the Town and Country Planning Act (1957).

- **Institutional Framework and Responsibilities** – the development of the NCHIP fell directly under the ministerial mandate of the then Ministry of Local Government and Works (MLG&W) with the Town Planning Department (TPD) and the Ministry of Environment and Housing (MoEH) responsible for lands development and the revision of development orders for the parishes that will be affected by the Project. The direct operations of the NCHIP – Segment 2 – were embedded into the organizational chart of the MLG&W with direct responsibility of the Chief Technical Officer. The project was to be carried out by a single contractor and supervisory firm and oversight being done by a Project Administrative Unit (PAU). A defined organizational structure is as shown in the diagram below.



- **Operational Processes and Procedures** – for the NCHIP a defined process seemed in place in all the major phases viz: (i) 1994 – There was the commissioning of an initial Environmental Impact Assessment (EIA) investigation was carried out in addition to conceptual designs on the NCHIP; (ii) 1996 – After refinements to the initial designs done in 1994, a field analysis was done for the EIA accompanied by extensive public review at meetings promoted and arranged by the MLG&W and local parish councils. In this process it was ascertained that more than half of individuals desired to be moved as a result of the development of the highway on their property and they stated clearly where they desired to be moved to. Copies of the report⁸ were then made available to the necessary

⁸ This Report covered the following:

- Geology/Physiography – topography mostly flat, low and elevating coastal plain lying between 2-10 meters above sea level. Coastal features fringing coastal reefs in many areas and in many cases abutting the mainland and extending up to 1 km from shore. Geology includes; alluvial sand, gravel and clay all underlain by limestone. For Segment 2 geological formations proceeded sequential as follows:
 - Group 6 – this was Gibraltar/Bonny Gate, Walderston, Montpelier and Ipswich Formations. These comprised yellow brown clays and sands. The most significant Key Environmental Feature which was in a realignment area was a deep rotational stump at Mesquite Cove this was tagged by the NRCA.

institutions such as parish libraries, offices, NGO offices of seven (7) parishes.⁹ A Resettlement Action Plan was carried out by the Resettlement Execution Unit including census which focused on issues such as; demographics, business and economic activity, place of work, tenure status, list of assets, utilities, special needs of households, family ties, family graves and markers, landmarks, fruit trees, items of sentimental value, church, health services, schools.

Sustainability Classification SU:			
<input type="checkbox"/> Highly Probable (HP)	<input checked="" type="checkbox"/> Probable (P)	<input type="checkbox"/> Low Probability (LP)	<input type="checkbox"/> Improbable (I)

VI. MONITORING AND EVALUATION

A. Information on Results

- 6.1 There is no evidence on the NCHIP that data quality (in both the collection process and/or the finished product) was below that required by the stakeholders. In the planning phase detailed baseline information was gathered to inform project designs. Initial reports, semi annual reports by the executing agency and the Bank, Project Preparation and Monitoring Reports (PPMR) and other correspondence at all stage throughout the project had been provided with the required information on the monitoring and evaluation for the NCHIP.¹⁰ Due to the highly technical nature of the project data collection, specifications were in most cases to international best practices and also the latest technology was used in data gathering and analyses. This was present from the planning phase as the HDM-3 (presently the HDM-4) was used to assess and analyze data provided. Critical data which has been useful to date have been:

- Group 4 – upper coastal group. This comprised hard reef limestone with subordinate marley limestone and detrital deposits. These were deemed stable and not prone to impact the highway.
- Climate – Tropical 20°C
- Oceanography and Waves – the area has a small tidal range of 0.5 meters between high and low tide. The major challenge to the development is that of storm surges 2 metres or more.
- Vegetation – marshes, mangrove swamps, woodland forest, pasture, open woodland, scrub, cultivated lands. Only a small parcel of natural vegetation existed as secondary forests are most common. The dry semi-evergreen forests do possess endemic and rare species of plants and animals.
- Fauna – wildlife and fish, bats, mongooses, small lizards, tree frogs, toads, several birds and fishes, freshwater turtles in non-brackish inland waters.
- Socio-economy and Land Use – the population affected is approximately 790,000 with an existing unemployment level of 15 per cent. Note that the labour force is dominated by 56 per cent of males. Agriculture is dominated by single family farms, focused on vegetable plots and small commercial farms and plantations (bananas, mangoes, sugarcane, papayas).
- Urban Areas – all characterized by inadequate drainage, gullies and the need for the widening of streets
- Heritage Sites – archeological sites were identified and surveyed in: Rio Bueno, Duncans, Mountain Spring, Coral Spring, and Seville.
- Baseline information on outcomes were gathered before Board approval
- The Borrower had a defined data gathering system in place
- Data performance was being maintained on agreed output and outcome indicators
- There were no major problems related to quality, validity and timeliness of the data gathering system

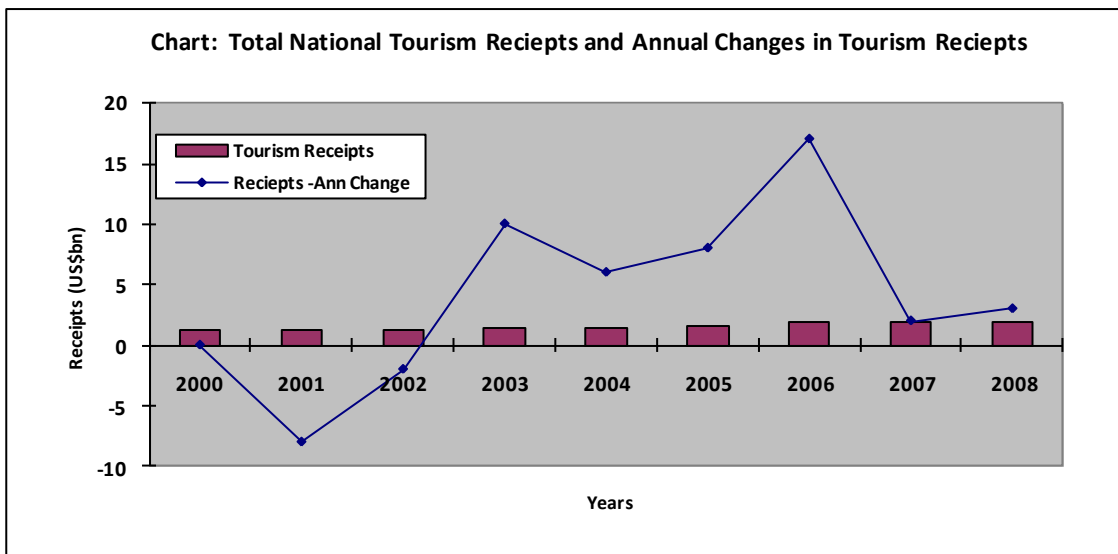
⁹ Westmoreland, Hanover, St James, Trelawny, St Ann, St Mary and Portland

¹⁰ All PPMRs reviewed stated that:

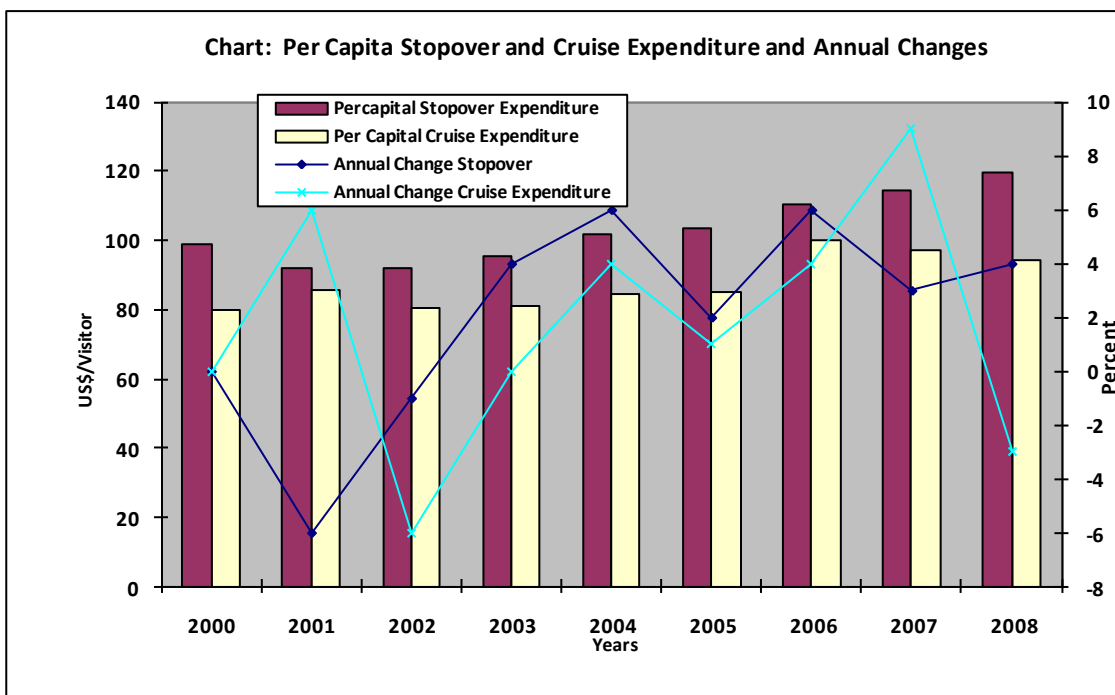
- Road Condition Data – obtainable from consultants and internal project teams e.g. International Roughness Index (IRI)
- Traffic Surveys – done to international classification by the NWA
- Geographic and Related Physical Data – integrated from base maps and GIS information e.g. curvature and elevation of road sections
- Vehicle Fleet Data – from the Island Traffic Authority (MT&W)
- Socio –Economic Data – data on economic, sociology etc
- Organizational Indicators – organizational capacity, structure and dominant corporate process requirements.

B. Results

- 6.2 Tourism Expenditure – The goal of the project is to increase the average annual national tourism receipts. The year 2000 saw receipts from tourism being US\$1.33 billion and the 2008 figure being 1.97 billion. Details of the annual progression are shown in chart below.



- 6.3 Detailed assessment of expenditure per person in both cruise shipping and stopover visitors over the same period shows average annual expenditure being 3 and 4 per cent respectively.



- 6.4 In short the NCHIP (Segment 2) has not yet significantly impacted on tourism receipts in the region. This may be due to the fact that the project was behind in schedule and also that project assumptions did not hold as there were years where natural disasters and economic downturns affected tourism arrivals and expenditure.
- 6.5 With regard to the lower transportation costs the roughness of the road is below 3000 mm/km and travel times cut to 1 hour. This has been verified by field visits, PPMRs, and other file reports. These were not however achieved by 2002 due to the extension of the project.
- 6.6 The next output was the successful completion of the project, an environmental plan successfully implemented and the relocation of 435 persons and a pilot maintenance system installed and calibrated. These were all completed although not in the required time.
- 6.7 The original road (before the NCHIP) had average dimensions of varying from 5.5 - 7.3 meters in width (with areas with shoulders having 1.8 – 2.4 meters). Design speed in most areas was 30 km/hr. Sight distances (both horizontal and vertical) were well below requirements for the 80km/hr posted speeds. The post project design is for 80km/hr and 50 km/hr for urban areas. Typical sections are now 7.3 meters wide with 2.4 meter shoulders and drainage on both sides with an addition of traffic lights at critical points. There are now clear zones from the edge of the pavement (in some places 5.5 – 7.0 meters provided). There are now box culverts providing 50 year storm returns and pipe and ditches with 10 year storm returns. The stated outputs have therefore been achieved.

C. Future Monitoring and Ex-Post Evaluation

- 6.8 The nature of the NCHIP with regard to its expected outputs and outcomes requires an ex-post evaluation. This should be done three years after the date of this project completion report. It should clearly show the following:
- The level of reduction of transport costs in constant figures
 - Improvement of vehicular and pedestrian safety
 - Alleviation of congestion along certain sections of roadway
- 6.9 These outputs are currently being monitored by the various divisions and department of the MT&W and also the NWA. The outcomes of the project must be calculated such as:
- Expansion of the tourism industry
 - Diversification of the Jamaican economy and provision of foreign reserves to support economic development.
- 6.10 The ex-post evaluations should also show net benefits accrued from the project. This would represent benefits from the project which are a result of the NCHIP input alone.

VII. LESSONS LEARNED

1. The use of dual consultants with regard to supervision and design. It was agreed that it may be better to keep the roles together.
2. The use of materials for the road surface's finish was a critical issue. The limestone used is one that creates a slippery road surface. Planners have determined that it is better to use black stone aggregates. These are now being laid especially when approaching and exiting sharp turns.
3. The required inter-agency co-ordination was non-existent in some cases. To ensure that there is not a repeat of this, new loan contracts must not just have special and general conditions but they also must have appended performance based Memoranda of Understanding (MOU) with the necessary organizations. In addition MOUs and logical frameworks must have performance breach levels attached to them and where necessary sanctions must be enforced where there is non performance.
4. The Bank should also in future consider including a project component specifically for utility removal with the necessary accompanying budget.
5. A Project Steering Committee that meets every quarter and a Management Committee that meets every month must be put in place to have close technical and managerial oversight of projects of this nature. This must have membership of all stakeholders e.g. the IDB, the line ministry and agency in charge, MOF, NEPA, Commissioner of Lands, contractors etc. Assessment of the NCHIP

showed that there was the need for this. This process should be stated in detail in the Operating Manual or the Initial Report.

6. All land acquisition or resettlement and clearance of all rights of way must be completed prior to the award of the civil works contract
7. Time must be used more wisely, project management must be aware that due to the fact that one is in a country where devaluation and inflation is a perpetual challenge costs increases are inevitable. The longer a task is taken to be achieved the greater the financial and related risk the project faces.
8. Project scheduling by all partners must be aware of the political environment and also fiscal challenges being faced. The time period laid out for the project must undergo rigorous debate before consensus. Some stakeholders clearly state that one of the reasons the costs went up was due to the fact that the original time line was unrealistic.

JAMAICA Loan 972/OC-JA (JA0044)

Minutes North Coast Highway Improvement Project (Segment 2) Exit Workshop held April 16, 2010

At the Inter-American Development Bank

Knutsford Boulevard

Kingston 5, Jamaica

Meeting was called to order at 9:25am. Present at the exit meeting re Loan 972/OC-JA held on Friday 16th April 2010 were:

Mr. Brian Martin McNish	- Transportation Specialist, Inter American Development Bank
Mr. Kevin St Croix Morrison	– Consultant
Mr. Earl Patterson	– Director Project Implementation, National Works Agency
Mr. Alphonso Marshall	– Project Manager, National Works Agency
Mr. Steve Reid	– Project Engineer, Ministry of Finance and Planning
Mr. Desrick Litchmore	– Project Coordinator, National Works Agency
Mr. Michael Thorney	– Civil Society Member, Association of Development Agencies

1.0 Introduction and Welcome

Mr. McNish offered words of welcome to all participants, thanking them for coming based on their tight schedules and then gave a brief background to the Project and proceeded immediately to handing over to Mr. Morrison. The consultant began his presentation and informed attendees that the format was an open one where discussions were held after a major topic was presented. Topical areas were similar to the major headings in the Project Completion Report.

2.0 Project Profile

With regard to the intricacies of the project profile all participants agreed with the project profile as presented.

3:0 Project Context

With regard to the project context Mr. Patterson enunciated that the project had been an evolving one in the planning stages which had morphed from a minor rehabilitation of the old road to a more complex highway improvement project. He made reference to the fact that along the planning and also development phase there were major changes such as:

- The bypasses at Duncans and Rio Bueno which were not in the original designs but NWA professionals lobbied for this.
- Curbs are now safer being designed for 90 kilometres per hour. These were not in the original project specifications.
- The original design had a four (4) lane road only from Montego Bay to the Sangster International Airport. All planners at that time thought that this was inadequate for a growing region and expanded the project to the current dimensions.
- The provision of numerous right turn lanes which were not placed on the original designs
- In addition there were a lot of right turning lanes which were not in the original proposal
- The repair of numerous township roads, first because they were being used by the trucks which were transporting material to the project and second due to the state in which these roads were at the time which would not make them proper feeder roads to the major highway.

4.0 Results

There was general agreement by attendees on the outputs, outcomes, financial costs and the externalities. In addition attendees (Messrs Marshall and Patterson) from the NWA stated that the Pilot RMMS was not a success and believed that although this was supposed to advance the process of record keeping it was much too complex for the project and was not effective due to the fact that it was designed for a much larger road network than the NCHIP.

Reference was also made to the project costs and significant variations that the project experienced especially for the civil works component. Attendees stated that this was not due to time losses alone but major scope changes. Mr. Marshall made reference to the fact that the original asphalt specification was 1 ½ inches this was changed to four (4) inches.

In the discussions on the externalities the project experienced, Mr. Patterson was quick to point out that at the time of the project many of the major institutions were either relatively new or were just being set up. For instance the National Environmental Protection Agency (NEPA) was going through a learning process for this and related projects and therefore the NCHIP actually assisted in this institution being the functional agency it is today. This is exemplified in processes such as the design and implementation of environmental action and management plans.

5.0 Project Implementation

The critical issues discussed here were the challenges that were experienced with the project from the tendering process to administrative close-out.

Mention was made of the fact by Mr. Marshall that after contract award of the civil works component, the project was not immediately mobilized as a tenderer lodged a protest and this took some time to start major activities. Major factors that also created time variations were the protracted removal of utilities. NWA attendees stated that this created major challenges in project logistics and management as the Jamaica Public Service and National Water Commission sometimes did not cooperate as requested during the project implementation process. This impacted on the performance of the executing agency as they were the ones held accountable for time and cost variations.

Another critical factor they stated were the existing limitations of the GOJ budget as at the time there were challenges with regard to fiscal space and government disbursement of their contribution to the project was slow in coming. There were attendees to the meeting who stated that Section 1 of Segment 2 was tendered separately and this may have been a mistake as the original contractor would have done it cheaper.

Attendees also stated that it was at this time that the lack of consensus between the professionals working on the project and the IDBs technical team was at a high point. With regard to their views on the Bank's performance they stated that it was not always easy working with the Bank, in terms of getting consistent and timely information and decisions. In particular they raised issue with the Bank's mission of 2005 which was very critical of the project's performance and who did not seem to listen to the reasons which were being tabled by the executing agency at the time.

6.0 Sustainability

All stakeholders at this juncture stated that this is a major threat to the asset currently. All attendees spoke to the fact that some sections of the roadway are having problems with tree growth and overhangs in the corridor and right of way. Attendees then proceeded to discuss options with regard to sustainability viz:

- Tolling of Sections of the Roadway – this was not seen as a credible option due to the fact that; [a] it had the possibility of reducing the amount of road use and [b] there were credible alternative routes which road users can travel
- The use of a truck weighting system – this was seen as a vital necessity in the road maintenance programme
- An adopt a roadway Programme – this is now in effect in north Montego Bay where hotels are contributing to routine maintenance of the road. This is also supported by the Tourism Enhancement Fund

In addition there is now the need in routine maintenance programmes to make changes in building materials for some sections of the road such as the nature of black stone aggregates for the asphalt.

7.0 Lessons Learnt

Participants have stated that there were numerous lessons to take from the project. Major items discussed were:

- The use dual consultants with regard to supervision and design. It was agreed that it may be better in the future to separate the roles
- The use of materials for the road surface's finish was a critical issue. The limestone used is one that creates a slippery road surface. Planners have found out that it is better to use black stone aggregates. These are now being laid especially around corners.

In closing the attendees stated that notwithstanding the challenges, the road is now a national and international success story endorsed internationally by being awarded the 2010 Outstanding Civil Engineering Achievement Award in Utah.

JAMAICA
NORTHERN COASTAL HIGHWAY IMPROVEMENT PROJECT

Borrower Evaluation



Inter-American Development Bank
Project Completion Report –2006 PCR
Borrower Evaluation

Project Name: Northern Coastal Highway Improvement Project LO-972/OC-JA	
Executing Agency: The National Works Agency of the Ministry of Transport and Works	
Borrower: Government of Jamaica	
Date of Project Approval: November 26, 1996	Date of Contract Effectiveness: March 31, 1997
Date of Borrower Evaluation: April 16, 2010	Expected Date of Exit Workshop: April 16, 2010

Borrower Project Performance Ratings

Probability on Achieving its Development Objective(s):

☐ Highly Probable (HP) ☒ Probable (P) ☐ Low Probability (LP) ☐ Improbable (I)

Project Implementation:

☐ Highly Satisfactory (HS) ☒ Satisfactory (S) ☐ Unsatisfactory (US) ☐ Very Unsatisfactory (VU)

Sustainability of Project Results:

☐ Highly Probable (HP) ☒ Probable(P) ☐ Low Probability (LP) ☐ Improbable (I)

Comments:

All projects objectives were comprehensively achieved.

Borrower Performance During Project Execution

Please rate your own performance during Project Execution:

☐ Highly Satisfactory (HS) ☒ Satisfactory(S) ☐ Unsatisfactory (US) ☐ Very Unsatisfactory (VU)

Comments:

Project was completed within budget and minimal extensions to contract.

JAMAICA
NORTHERN COASTAL HIGHWAY IMPROVEMENT PROJECT

Bank Performance During Project Preparation

Please rate the Bank's performance during project preparation. Factors to be considered include the extent to which the Bank facilitated a participatory project design, proposed adequate technical solutions to the problems identified, and responded to the needs of the Borrower (timeliness, selection of instrument type).

[☒] Highly Satisfactory (HS) [☐] Satisfactory(S) [☐] Unsatisfactory (US) [☐] Very Unsatisfactory (VU)

Comments:

There was excellent collaboration and consensus between the bank and GOJ during the design of the projects.

Bank Performance During Project Supervision

Please rate the Bank's overall performance during project supervision. Factors to be considered include technical assistance (including informal and formal training) to Executing Agency, timeliness of Bank response and the Bank's flexibility to respond to emergency situations during project implementation.

[☒] Highly Satisfactory (HS) [☐] Satisfactory(S) [☐] Unsatisfactory (US) [☐] Very Unsatisfactory (VU)

Comments:

A very good spirit of partnership existed between the Bank and GOJ during the execution.

Additional Suggestions for Improving Bank Performance

Additional comments/suggestions for improving Bank performance in the future.

Continuous fortnightly meetings between the Bank and the Executing Agency instituted by the Project Team Leader during the end of project execution proved to be an invaluable instrument in finalizing this project which should be explored as a monitoring tool for future Bank operations.

PROJECT COMPLETION REPORT

NORTH COAST HIGHWAY IMPROVEMENT PROJECT

Country: Jamaica

Sector/Subsector: Transportation

972/OC-JA

April 15th 2010

Kevin St Croix Morrison

Brian Martin McNish

PROJECT PROFILE

- Borrower: JAMAICA
- Executing Agency (EA): MINISTRY OF LOCAL GOVERNMENT AND WORKS
- Sector: TRANSPORTATION
- Disbursements
 - * Amount to date: 59,082,869.00
(%) 99.3
- Total Project Cost (Original Estimate):
85,000,000
- Date of Board Approval: 26 Nov 1996
- Date of Loan Contract Effectiveness: 31 Mar 1998
- Date of Eligibility for First Disbursement: 29 Sep 1998
- Months in Execution
 - * from Approval: 152
 - * from Contract Effectiveness: 148
- Disbursement Periods
 - Original Date of Final Disbursement: 31 Mar 2002
 - Current Date of Final Disbursement: 30 Sep 2009
 - Cumulative Extension (Months): 90
- Loan Amount(s)
 - * Original Amount: 59,500,000
 - * Current Amount: 59,500,000

PROJECT CONTEXT

- Project was developed and designed between 1994 – 1996
- Segment 2 - 97 km from Montego Bay to Ocho Rios and was funded with IDB and GOJ Resources
- The original time period for disbursement - **60 months**
- Final estimated disbursement date of 31st March 2003.
- Actual NCHIP final disbursement was realized on September 30, 2009,
- The project actually took eleven and a half (11 ½) years to realize its terminal disbursement.

DEVELOPMENT OBJECTIVE(S)

- The overall objective of the Project is to finance the improvement of 97 kilometers of the Northern Coastal Highway between Montego Bay and Ocho Rios (Segment 2), including amelioration of environmental impacts and resettlement of affected persons.
- The project specific development objectives were:
 - Road user costs along Segment 2 of the highway reduced and right of way cleared of all dwellings and structures
 - IRI reduced from 1996 value to current NWA standards for Class A roads by December 31 2008
 - Travel time from Greenside to Ocho Rios reduced from 2½ hours to approximately one hour by December 31 2008
 - Number of Project Affected Persons (PAP) with dwellings, commercial structures or obstructions in Right of Way for 70 kilometers of rehabilitated road to be settled/removed by December 31, 2008

PROJECT COMPONENTS

Section	Areas Covered	Length (km)
1	Montego Bay – Falmouth	27.3
2	Falmouth – Rio Bueno	26.1
3	Rio Bueno – Seville	21.6
4	Seville – Ocho Rios	21.7
TOTAL		96.7

Civil Works

- To allow safe traveling at 55 mph in unrestricted areas declining to 35 mph or less through townships and other restricted zones.

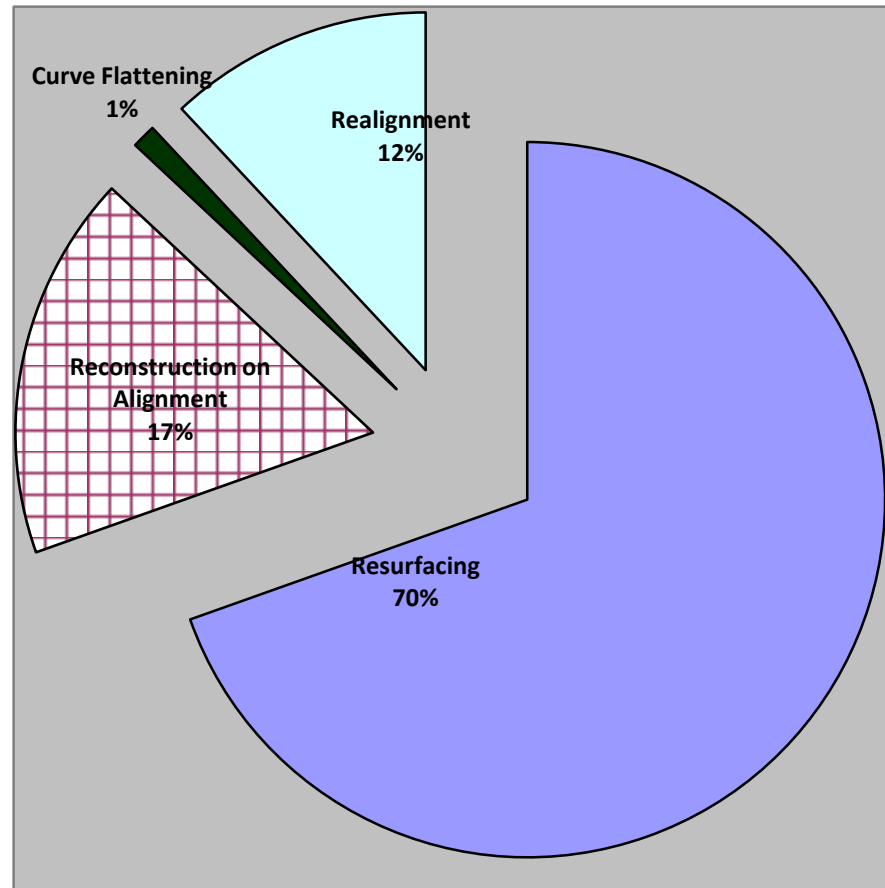
Environmental Protection and Resettlement Component

- NCHIP is anticipated to cause certain environmental impacts over the entire route as well as creating the need to remove some 435 dwellings from the proposed right of way

Routine Maintenance Component

- The Project included a pilot program for maintaining the works once completed.

APPORTIONMENT OF CIVIL WORKS



RESULTS

ACHIEVEMENT OF DEVELOPMENT OBJECTIVES (DO)			
Development Objective(s) (Purpose)	Key Outcome Indicators		
1. Road User costs along Segment 2 of the Highway reduced and right of way cleared of all dwellings and structures 1. IRI Reduced from 1996 value to current NWA standards for Class A Roads by December 31 2008. Unit – <u>mm/km</u> 1. Travel time from Greenside to Ocho Rios reduced from two and a half hours to approximately one hour by Dec 31, 2008 Unit - <u>hour</u> 1. Number of Project Affected Persons (P.A.P) with dwellings, commercial structures or obstructions in right of way for 70 kilometers of rehabilitated road to be resettled/removed by December 31, 2008 Unit – <u>p.a.p.</u> Classification: P	<u>Planned Outcomes</u> <u>Baseline</u> 1.1 <u>7500</u> (26 Nov 1996) 2008) 1.2 2.50 (26 Nov 1996) 1.3 226 (31 Dec 1999)	<u>Intermediate</u> 	

EXTERNALITIES

POSITIVE

- Employment Creation - 650-900 construction jobs. Estimated spin-off jobs were between 850 and 1100 individuals.
- Improved overall urban design, management and administration.
- Over 40 km of alternate and feeder roads (not listed on the original project outputs) were paved. These included feeder roads in Duncans and Falmouth (Trelawny) and the Mt Rosser Main Road. These did not just maintain existing road infrastructure but also preserved towns that are bypassed as a result of the Segment 2 of the highway and improved communication links with them.
- Increased productivity – from time decreases
- Improved admin of now more defined urban boundaries
- Safety ?
- Increased land values -

NEGATIVE

- Worksite -high levels of pollution and periodic lack of environmental safety during the construction phase of the project.. Challenges with fugitive dusts and respiratory particles were experienced by residents and with regard to water quality; reports show that fecal coliform, BOD and nitrate levels were higher than desired at Pear Tree Bottom. These incidents however saw the stakeholders immediately implement amelioration and mitigation strategies and negative effects seemed to cease after major construction activities.
- The most prominent long term negative externality may have been the removal of 8.7 – 10 hectares of noted land builders with root systems that trapped sediments and decayed organic material. In addition they protected coastal waters by absorption of undesirable nutrients and also the coastline from tides and storms. These areas were also natural habitats for birds, fish, invertebrate and other wildlife. No evidence to date has shown clear mitigation or compensation measures for this loss.

OUTPUTS

Components (Outputs):	Key Output Indicators:		
1. Environmental Mitigation and Resettlement	<u>Planned Outputs</u>		<u>Outputs Achieved</u>
Total cost of Component 1: 2,901,070 Counterpart: 1,501,070 IDB:1,400,000 IDB Disbursement: % 100 1. Environmental mitigation measures implemented Unit - % 2. Families removed and relocated elsewhere Unit - <u>no.</u> <u>Classification:</u> U	<u>Baseline* of Project</u>	<u>Annual/Intermediate</u>	<u>End</u>
	1.1 0(____) (30 June 2009)	1.1 _____	1.1 100
	1.2 (31 Dec 2008)	1.2	1.2 435
			2. 435 (29 Dec 2006)

OUTPUTS

2. Pilot Road Maintenance Total cost of Component 2:2,521,765 Counterpart: 121,765 IDB:2,400,000 IDB Disbursement: % 2.1 Road maintenance measures in place Unit - <u>%</u> 2.2 RMMS installed calibrated and functioning Unit - <u>%</u> <u>Classification:</u> S,	<table border="1"> <thead> <tr> <th colspan="3"><u>Planned Outputs</u></th> </tr> <tr> <th><u>Baseline*</u></th> <th><u>Annual/Intermediate</u></th> <th><u>End of Project</u></th> </tr> </thead> <tbody> <tr> <td>2.1 _____</td> <td>2.1I _____</td> <td>2.1 100 (31 Dec 2008)</td> </tr> <tr> <td>2.2 0 (____)</td> <td>2.2 _____</td> <td>2.2 100 (31 Dec 2008)</td> </tr> <tr> <td colspan="3">* (if applicable)</td> </tr> </tbody> </table>	<u>Planned Outputs</u>			<u>Baseline*</u>	<u>Annual/Intermediate</u>	<u>End of Project</u>	2.1 _____	2.1I _____	2.1 100 (31 Dec 2008)	2.2 0 (____)	2.2 _____	2.2 100 (31 Dec 2008)	* (if applicable)			<table border="1"> <thead> <tr> <th><u>Outputs Achieved</u></th> </tr> </thead> <tbody> <tr> <td><u>End of Project</u></td> </tr> <tr> <td>2.1 99 (30 June 2009)</td> </tr> <tr> <td>2.2 100 (29 June 2009)</td> </tr> </tbody> </table>	<u>Outputs Achieved</u>	<u>End of Project</u>	2.1 99 (30 June 2009)	2.2 100 (29 June 2009)
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2.2 100 (29 June 2009)																					
Briefly explain differences between planned and actual outputs (if applicable). [] N/A																					
Restructuring. Indicate if this component was restructured (date of approval by Manager). Briefly discuss the consequences of these changes. [X] N/A <i>(In case of more components, create new row and complete.)</i>																					
3. Civil Works Total cost of Component 3:85,480,274 Counterpart: 52,308,666 IDB:50,500,000 IDB Disbursement: % 3.1 70 km of road between Greenside and Ocho Rios improved to GOJ Class A1 Roads Standard Unit – <u>km</u> <u>Classification:</u> S,	<table border="1"> <thead> <tr> <th colspan="3"><u>Planned Outputs</u></th> </tr> <tr> <th><u>Baseline*</u></th> <th><u>Annual/Intermediate</u></th> <th><u>End of Project</u></th> </tr> </thead> <tbody> <tr> <td>3.1 0 (____)</td> <td>3.1I _____</td> <td>3.1 70 (31 Dec 2008)</td> </tr> <tr> <td colspan="3">* (if applicable)</td> </tr> </tbody> </table>	<u>Planned Outputs</u>			<u>Baseline*</u>	<u>Annual/Intermediate</u>	<u>End of Project</u>	3.1 0 (____)	3.1I _____	3.1 70 (31 Dec 2008)	* (if applicable)			<table border="1"> <thead> <tr> <th><u>Outputs Achieved</u></th> </tr> </thead> <tbody> <tr> <td><u>End of Project</u></td> </tr> <tr> <td>3.1 70 (30 March 2007)</td> </tr> </tbody> </table>	<u>Outputs Achieved</u>	<u>End of Project</u>	3.1 70 (30 March 2007)				
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PROJECT COSTS

- Total planned costs were US 85 million
- Compare with actual costs (last taken from files) of 113.7 million
- Variation – 28.7 million
- Civil Works
 - Planned 54.9 million
 - Actual – 85.5 million
 - Variation – 30.6 million
- Environmental Mitigation and Resettlement –
 - Planned –
 - Actual –
- RMMS –
 - Planned
 - Actual

PROJECT IMPLEMENTATION

- ANALYSIS OF CRITICAL FACTORS

The NCHIP experienced delays and the provision of extensions of time throughout its duration.

- There were also stated requests for extensions of time for items such as:
- NRCA Institutional Strengthening – the Authority (now NEPA) was to provide a detailed management plan
- Funding for maintenance activities
- The time taken for delivery of the Project Initial Report
- The time taken to designate Coral Spring as a protected area
- Delays from the removal of utilities and relocation of affected persons

BORROWER EXECUTING AGENCY

- Greater respect and regard for time – evidence from files shows that the Bank required the setting of realistic timeframes by both the Contractor and the Executing Agency
- Monitoring of supplier/contractor performance – closer monitoring was required of the single contractor for civil works.
- Time cost and budgeting issues – audits at one point were over seven months late
- Improvements required with regard to inter-agency co-ordination – more pressure may have been needed with regard to NRCA, the Jamaica Public Service (JPS) and the National Water Commission (NWC)
- Stronger overall project monitoring tools as per performance framework – simple things such as the implementation of a proper accounting system

-

BANK PERFORMANCE

- **The feedback given by representatives of the NWA is that the IDB in planning the project did fully not take into consideration two (2) major issues:**
- Project costs – in dealing with a road project of this nature, project costs must include utility movement. In this case an additional 25 per cent of total project costs was required for water and another 10 percent allocated to transfer and repairs to electricity mains.
- The time period for construction was unrealistic. Approximately five years is required for construction for a project of this nature, not the 32 months originally intended.
- Other issues that were stated in relation to this were; [a] the perceived lack of consensus in the making of critical decisions such as the IDB mission of 2005 that made design changes which some technocrats did not agree with and [b] the RMMS which was complex and deemed an 'overkill' for such a relatively small project.

-

SUSTAINABILITY

Section	ERR	NPV
Montego Bay – Falmouth	34.94	63.72
Falmouth – Discovery Bay	33.31	47.13
Discovery Bay – St Ann	45.59	43.36
St Anns Bay – Ocho Rios	45.62	29.20
TOTAL	37.39	183.83

- Another important aspect of the analysis is that more than 80 per cent of cost of the road will be moved to the road user. This is shown by HDM-3 and HDM-4 models. Note also that it is a Government managed road and the maintenance will be directly borne by the public purse.
- This is due to the fact that a road of this size has over 5,000 vehicles per day.

SUSTAINABILITY

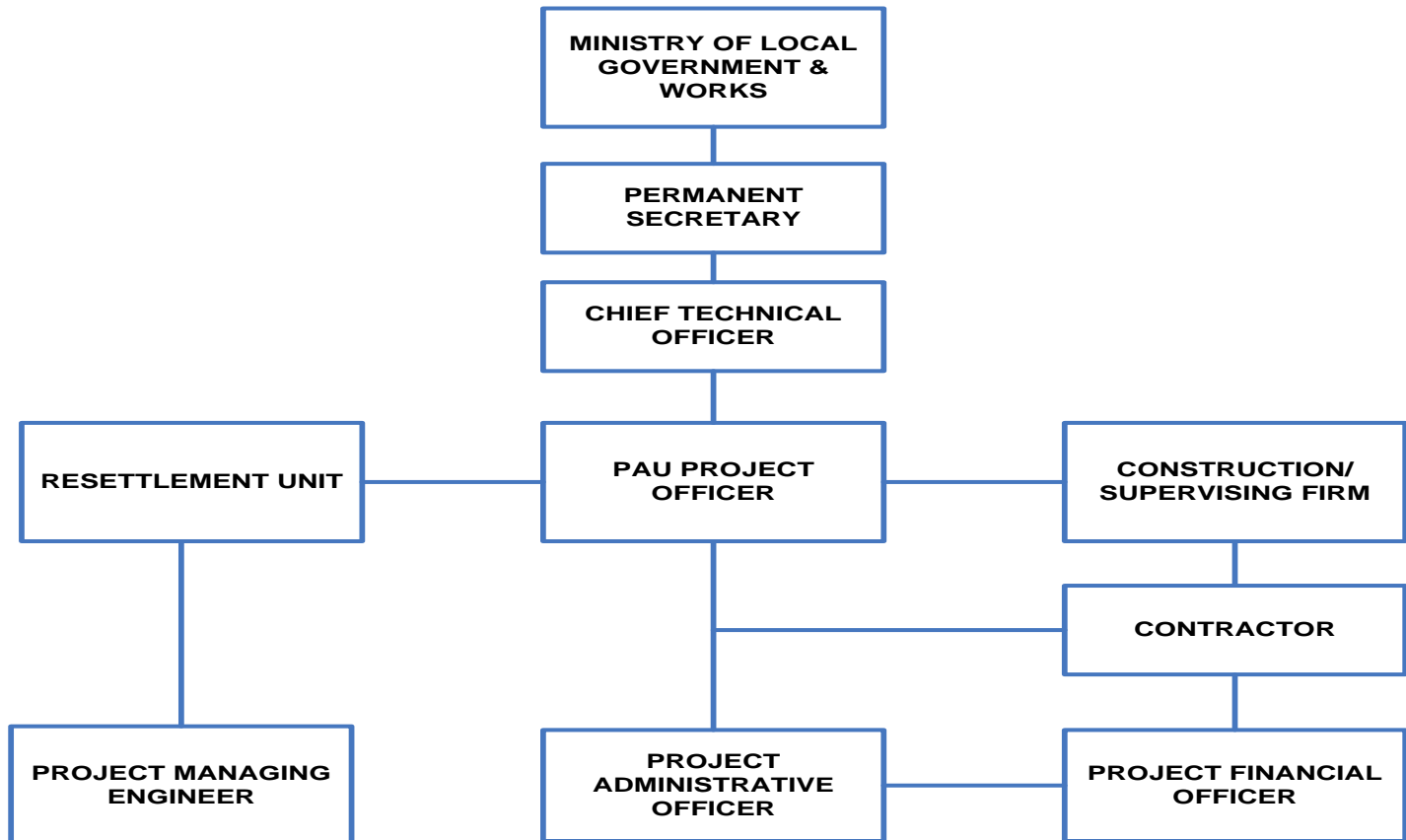
- **POTENTIAL RISKS**
- Adequate financing to provide routine and periodic maintenance is a key challenge which the investment will face over time.
- Another related problem is lack of enforcement of vehicle loads. Studies show that this segment of the highway carries the highest number of 3+ axle and articulated vehicles as it is a major route to Kingston
- There is also the risk that a strong environmental and planning system is not enforced which forces degradation of areas e.g. the Coral Spring forest and also renewed attempts at squatting on lands adjacent to the highway.
- **Economic Risks** – the investment is one where the payment must be made from the public purse. There is the risk that the actual returns are not commensurate as over time technology changes can make other transportation options much cheaper. In the case of the NCHIP this is not highly probable.
- **Environmental Development Risks** – the advent of the road may create development and socio-economic challenges to the management and sustainability of small neighbouring towns. The advent of bypasses may decrease business activity for these small municipalities and lack of local income can trigger downward development spirals. There is no major evidence that this is highly probable especially when looking at south coast towns such as Old Harbour.
- **Organizational and Management Challenges** – the possibility that the expectations of the Public Sector Modernization Programme (of which the NWA and the MT&W and MLG are a part) are not fully realized.

INSTITUTIONAL CAPACITY

INSTITUTIONAL FRAMEWORK

- **Legal Framework** – land was acquired under the Land Acquisition Act (1947) and the institution responsible was the Commissioner of Lands and only those PAPs with titles were originally slated to be compensated. Environmental management was to be enforced using the Natural Resources and Conservation (NRCA) Act (1991) and development standards by the Town and Country Planning Act (1957).
- **Institutional Framework and Responsibilities** –the development of the NCHIP fell directly under the ministerial mandate of the then Ministry of Local Government and Works (MLG&W) with the Town Planning Department (TPD) and the Ministry of Environment and Housing (MoEH) responsible for lands development and the revision of development orders for the parishes that will be affected by the Project.
- **Operational Processes and Procedures**
 - for the NCHIP a defined process seemed in place in all the major phases viz:
 - 1994 – There was the commissioning of an initial Environmental Impact Assessment (EIA) investigation was carried out in addition to conceptual designs on the NCHIP.
 - 1996 – After refinements to the initial designs done in 1994, a field analysis was done for the EIA accompanied by extensive public review at meetings promoted and arranged by the MLG&W and local parish councils. In this process it was ascertained that more than half of individuals desired to be moved as a result of the development of the highway on their property and they stated clearly where they desired to be moved to. Copies of the report were then made available to the necessary institutions such as parish libraries, offices, NGO offices of seven (7) parishes. A Resettlement Action Plan was carried out by the Resettlement Execution Unit including census which focused on issues such as; demographics, business and economic activity, place of work, tenure status, list of assets, utilities, special needs of households, family ties, family graves and markers, landmarks, fruit trees, items of sentimental value, church, health services, schools.

INSTITUTIONAL CAPACITY

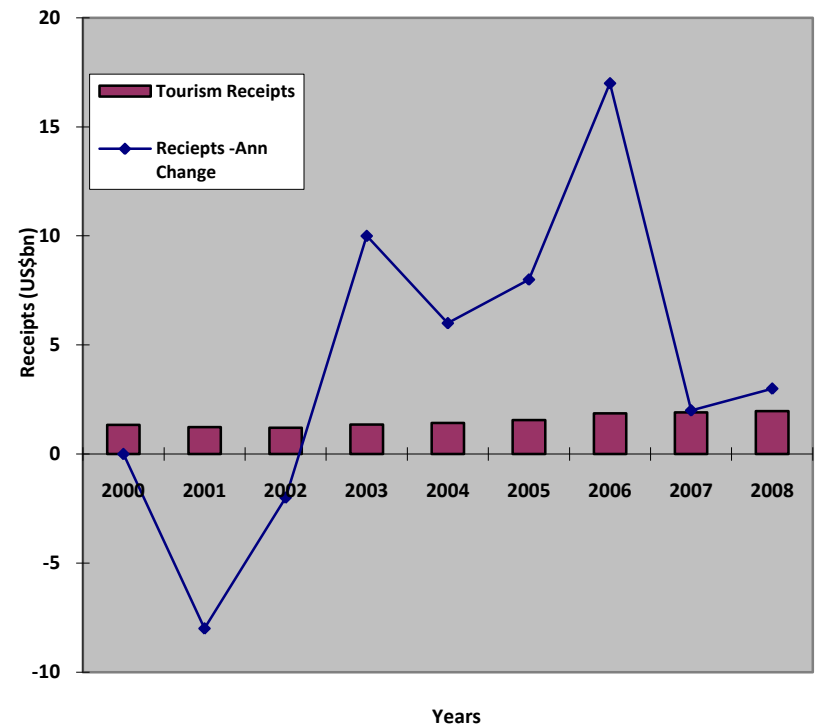


MONITORING AND EVALUATION

INFORMATION ON RESULTS

- Tourism Expenditure - Detailed assessment of expenditure per person in both cruise shipping and stopover visitors over the same period shows average annual expenditure being 3 and 4 per cent respectively (not the 6 per cent expected)

Chart: Total National Tourism Receipts and Annual Changes in Tourism Receipts



MONITORING AND EVALUATION

- With regard to the lower transportation costs and the installation of an RMMS; both have been accomplished as the roughness of the road is below 3000 mm/km and travel times are cut to 1 hour. This has been verified by field visits, PPMRs, and other file reports. These were not however achieved by 2002.
- The next output was the successful completion of the project, an environmental plan successfully implemented and the relocation of 435 persons and a pilot maintenance system installed and calibrated. The project was completed but not within time and budget. The relocation exercise occurred and the RMMS was installed and there is now an islandwide road maintenance programme being carried out by the NWA.
-
- The next output was the successful completion of the project, an environmental plan successfully implemented and the relocation of 435 persons and a pilot maintenance system installed and calibrated. These were all completed although not in the required time.
-
- Based on the logical framework another expected output was the full rehabilitation of Segment 2 and to carry out an environmental and resettlement plan for the segment and also to extend the road maintenance programme.
- The original road (before the NCHIP) had average dimensions of varying from 5.5 - 7.3 metres in width (with areas with shoulders having 1.8 – 2.4 metres). Design speed in most areas was 30 km/hr. Sight distances (both horizontal and vertical) were well below requirements for the 80km/hr posted speeds. Note also that more than 90 per cent of the project did not provide minimum safety for pedestrians. The post project design is for 80km/hr and 50 km/hr for urban areas. Typical sections are now 7.3 metres wide with 2.4 metre shoulders and drainage on both sides with an addition of traffic lights at critical points. There are now clear zones from the edge of the pavement (in some places 5.5 – 7.0 metres provided. There are now box culverts providing 50 year storm returns and pipe and ditches with 10 year storm returns. The stated outputs have therefore been achieved.

FUTURE MONITORING AND EX POSTE EVALUATION

- This should be done three years after the date of this project completion report. It should clearly show the following:
 - The level of reduction of transport costs in constant figures
 - Improvement of vehicular and pedestrian safety
 - Alleviation of congestion along certain sections of roadway

These outputs are currently being monitored by the various divisions and department of the MT&W and also the NWA and their calculations will be relatively straightforward.

- The outcomes of the project must be calculated such as:
 - Expansion of the tourism industry
 - Diversification of the Jamaican economy and provision of foreign reserves to support economic development.

The post and ex –post evaluations should also show net benefits accrued from the project. This would represent benefits from the project which are a result of the NCHIP input alone and pre and post project improvements.

LESSONS LEARNED

- The required inter-agency co-ordination was non-existent in some cases. To ensure that there is not a repeat of this, new loan contracts must not just have special and general conditions but they also must have appended performance based Memoranda of Understanding (MOU) with the necessary organizations. In addition MOUs and logical frameworks must have performance breach levels attached to them and where necessary sanctions must be enforced where there is non performance.
- The Bank should also consider including as a project component for utility removal with the necessary accompanying budget.
- A Project Steering Committee that meets every quarter and a Management Committee that meets every month must be put in place to have close technical and managerial oversight of projects of this nature. This must have membership of all stakeholders e.g. the IDB, the line ministry and agency in charge, MOF, NEPA, Commissioner of Lands, contractors etc. Assessment of the NCHIP showed that there was the need for this.
- All seemingly miscellaneous aspects of any project must be done before the project is implemented e.g. the putting in of all best practice systems e.g. accounting systems.
- All land acquisition or resettlement must be completed prior to the award of the civil works contract

LESSONS LEARNED

- Time must be used more wisely, project management and monitoring must be aware of the fact that due to the fact that one is in a country where devaluation and inflation is a perpetual challenge costs increases are inevitable. The longer a task is taken to be achieved the greater the financial and related risk the project faces.
- Project scheduling by all partners must be aware of the political environment and also fiscal challenges being faced. The time period laid out for the project must undergo rigorous debate before consensus. Some stakeholders clearly state that one of the reasons the costs went up was due to the fact that the original time line was unrealistic.

Project Summary

Contribution to the well-being of people and communities:

Both directly and indirectly, the design and construction of the North Coast Highway has resulted in vast improvements to Jamaica.

The following objectives were met:

- Improve safety and drainage
- Reduce travel time
- Reduce road maintenance costs
- Improve accessibility for tourist attractions
- Increase development potential/opportunity
- Increase construction job opportunities
- Stimulate the economy

The highway has improved the country's economy and economic development on multiple levels. Construction provided jobs and income to hundreds of local workers for 10 years. The on-the-job training qualified them for future skilled employment.



With little local industry, tourism is Jamaica's primary source of income. The highway vastly improved economic development by providing tourists with access to existing resorts, and spurring development of additional resorts.

Estimated Economic Impact of New Major Hotels/Resorts (USD)

- 1350 new hotel rooms/suites
- Annual revenue from all hotel operations: \$150 million
- 1300 jobs created for total personnel
- Annual income: \$8.5 million

Estimated Annual Economic Impact: Revenue to Government (USD)

- Income tax from business profit: \$10 million
- Consumption tax (paid by consumer): \$8 million
- Total revenue for government: \$20 million

The new highway was designed with safety in mind. The wider lanes, paved shoulders, turning lanes, and improved line of sight has improved motorist and pedestrian safety tenfold. The travel time from Negril to Ocho Rios has dropped from four to three hours. This equates to more opportunity for revenue for taxi and bus drivers, and an easier and faster way to move goods.

Now considered a national treasure, the Jamaica North Coast Highway has forever changed the face of transportation, and the economy, in Jamaica.



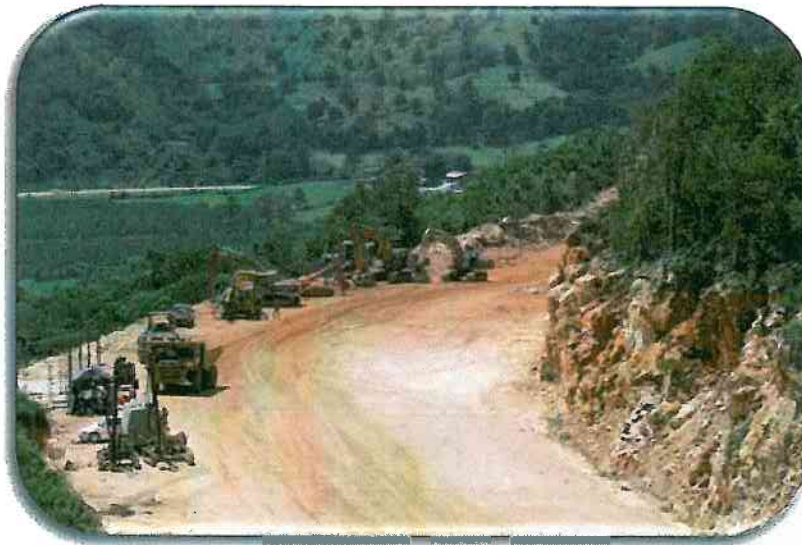
Resourcefulness in planning and solving design challenges:

On the surface it would appear that designing and building a 2-lane highway through mostly rural Jamaica shouldn't be overly complex. But what would have been a relatively straightforward project in the United States encountered complexity at every turn in Jamaica.

It was crucial to understand the politics and culture of Jamaica and find a way to work within the system. For example, Jamaica's unemployment rate is high. In keeping with the prime minister's pledge to provide employment for residents, the vast majority of the workforce was local. Laborers were anxious to be employed and receive a regular paycheck. But not anxious for the project to end.

Engineers applied sophisticated international design standards to an unsophisticated road. It resulted in a very classy road. All measurements were in metric but material standards were a combination of U.S., Canadian, and Jamaican specifications.

For bridge construction, there was no local concrete precast plant so contractors transported forms from location to location, cast the girders on site, then post-tensioned the girders. The contractors provided batch plants as part of their equipment.



Impact on Physical Environment:

Flooding is a major issue. Roadways are hit especially hard during these times, and given the poor condition of the previous highway, travel became impossible during flood season. To eliminate flooding, the road was raised above normal storm surge levels and additional drainage was placed under the road to route water directly back to the ocean.



Beneficial/adverse effects of the project, including aesthetic value:

Beneficial:

- Improved drainage, water and sewer systems.
- Several new scenic vistas allowed tourists to enjoy ocean views and improved safety for sightseers and other drivers.
- The project “generated a lot of jobs, both skilled and professional,” said Dr. Alwin Hales, Permanent Secretary for the Ministry of Transportation and Works. Along the route, areas were designated for commerce and labor trades.
- Homes of about 440 people – many of them poor – displaced during the second phase of construction were relocated in houses built from superior materials and given title to the property. “This particular project had a conscience,” said Hales.

Adverse:

- Jamaicans were very eager to use the new highway. During construction it proved virtually impossible to keep enthusiastic motorists off the new road, even though the old highway was still available. This created a safety hazard and multiple delays.

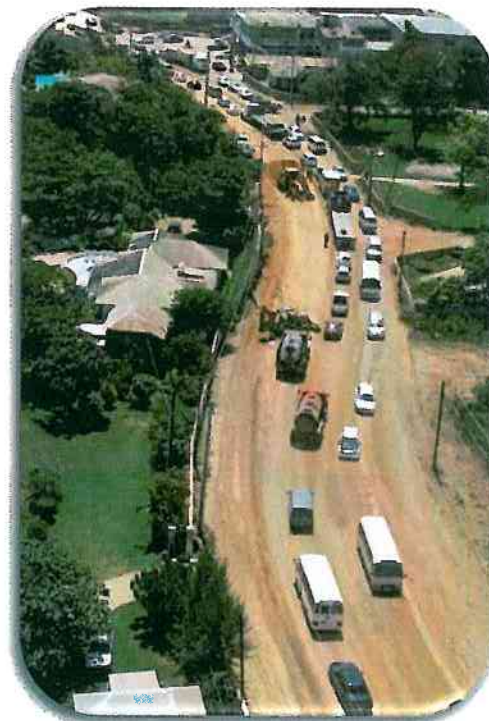




Photo 1:

Built in the 1960s and 1970s, Jamaica's North Coast Highway is the country's only road traveling to major tourist destinations. Lack of maintenance on the highway compromised safety, and led to serious deficiencies with pavement structure, drainage and roadway structures. The highway is now considered a national treasure.

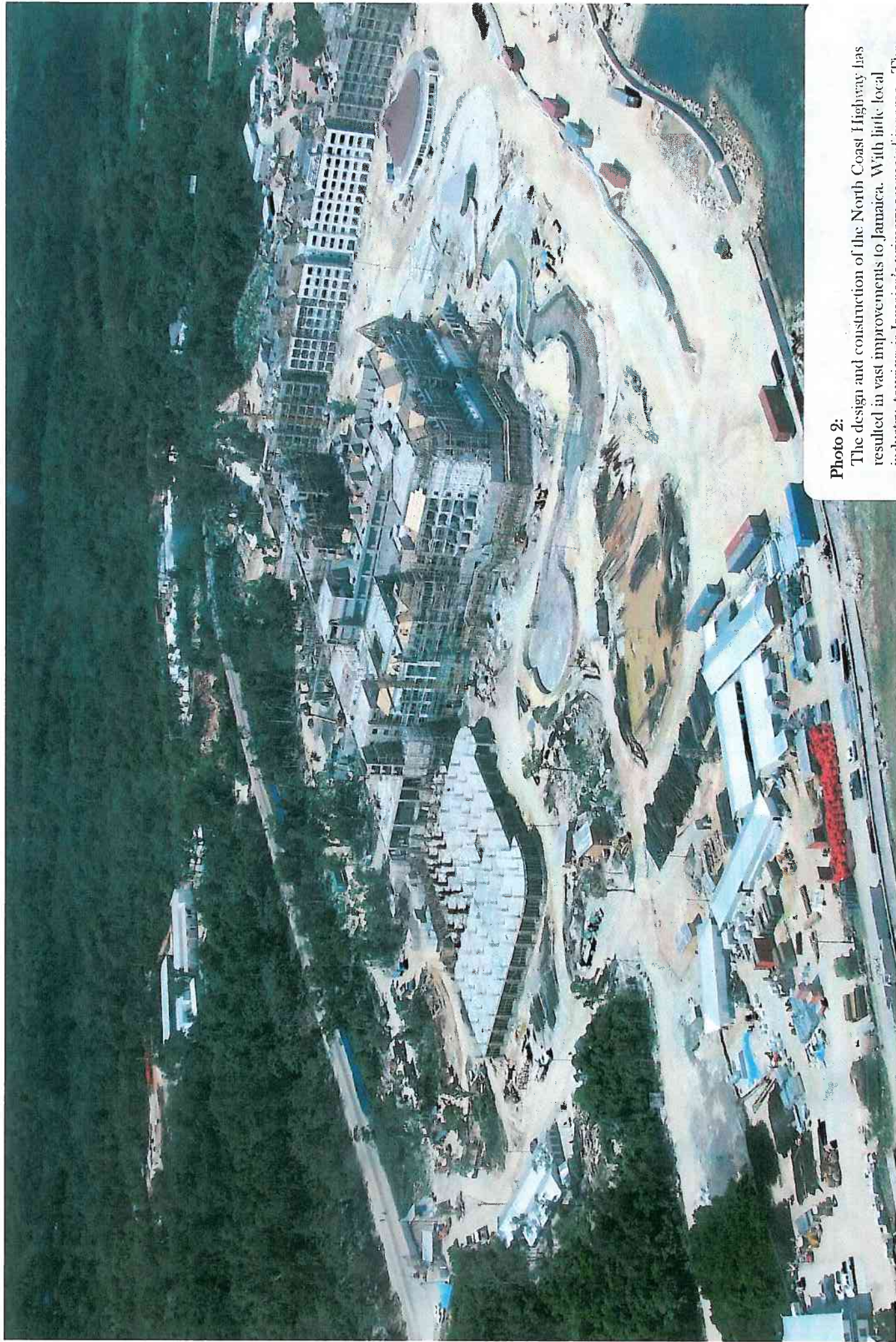


Photo 2:

The design and construction of the North Coast Highway has resulted in vast improvements to Jamaica. With little local industry, tourism is Jamaica's primary source of income. The North Coast Highway has improved economic development by providing tourists with access to existing resorts, and has spurred development of additional resorts.

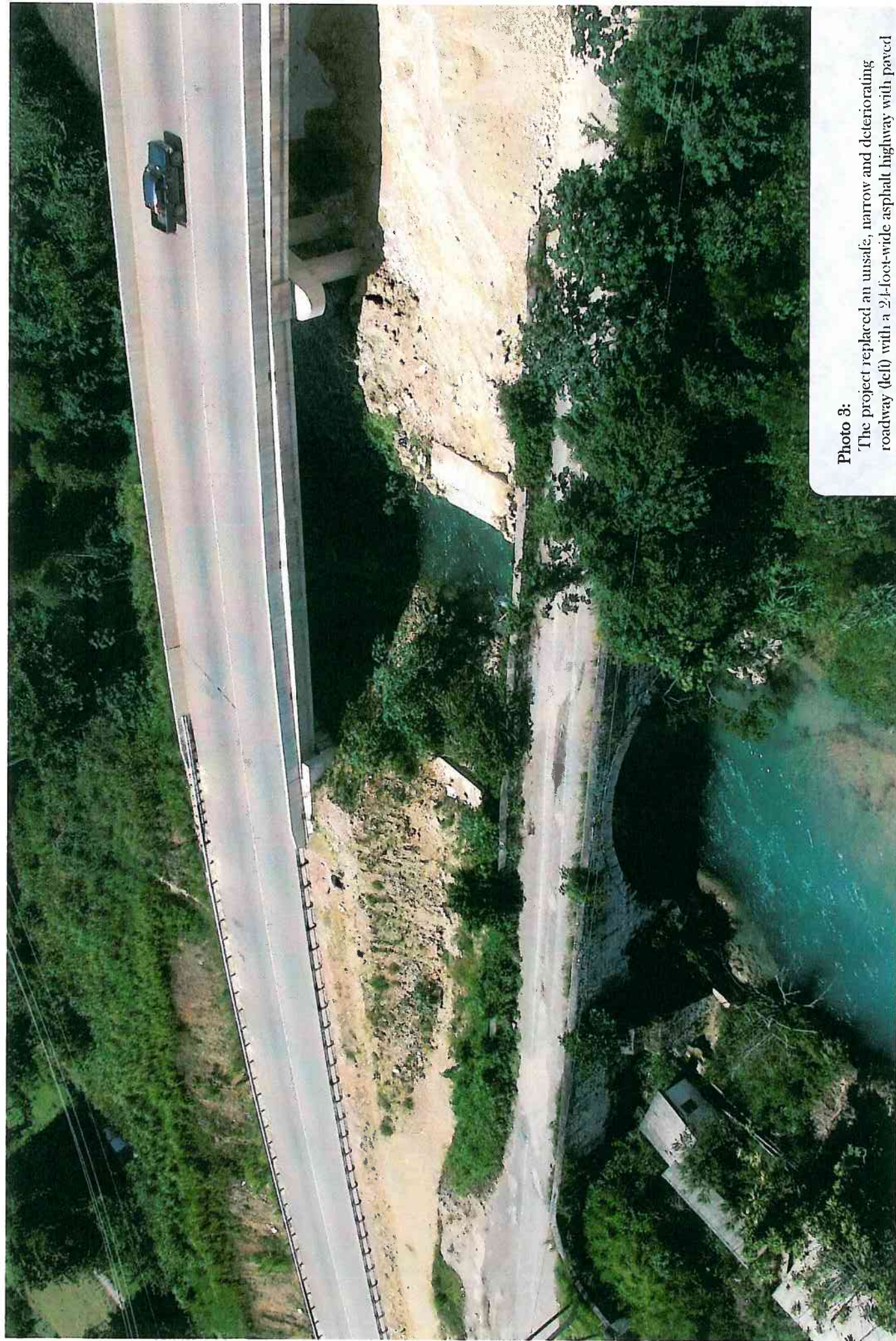


Photo 3:

The project replaced an unsafe, narrow and deteriorating roadway (left) with a 24-foot-wide asphalt highway with paved shoulders, improved safety features, and beautiful views (right). The highway has not only reducing the driving time from Negril to Ocho Rios from four to three hours, it has improved the economy of Jamaica and the livelihood of many Jamaicans.

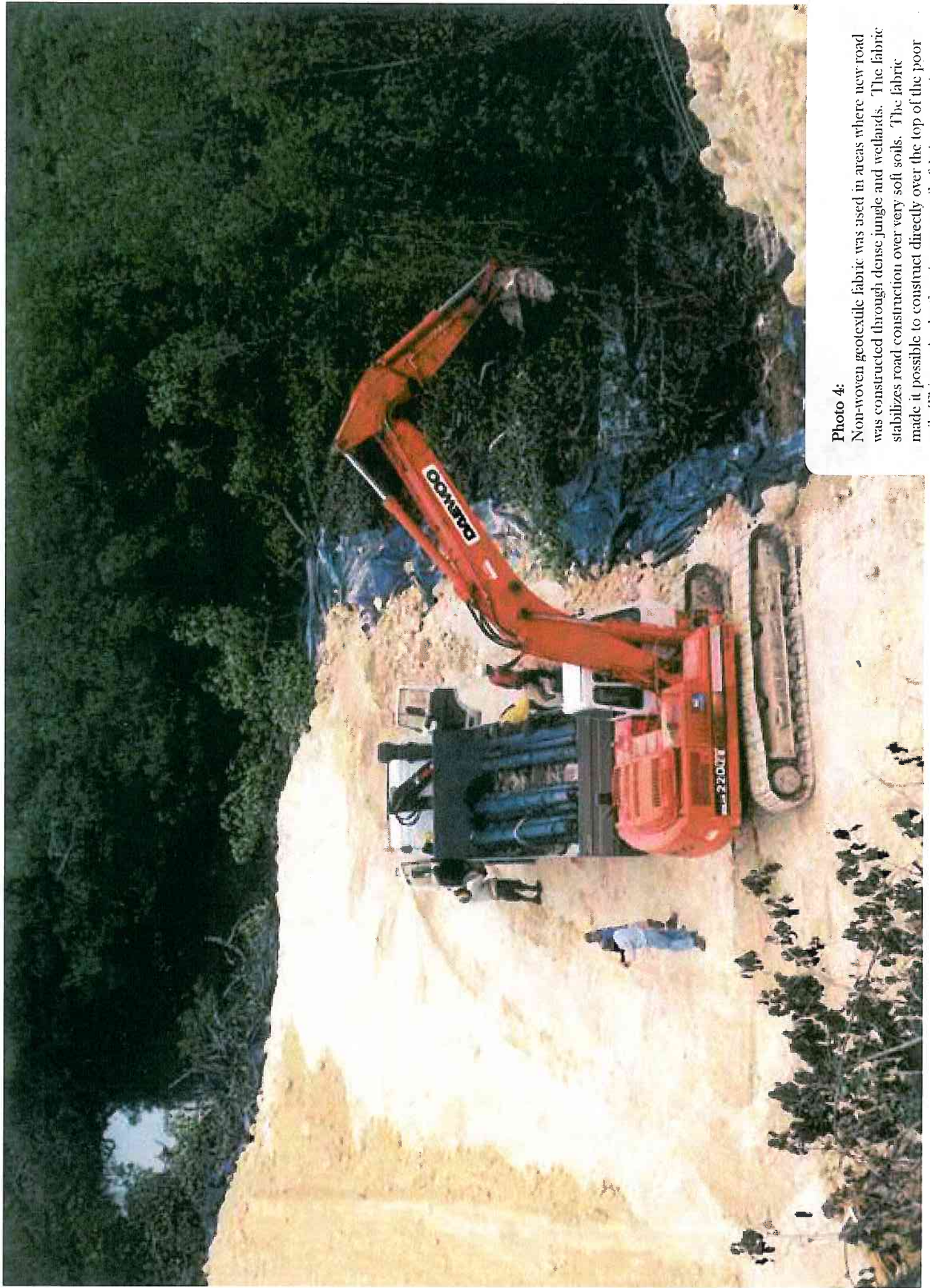


Photo 4:

Non-woven geotextile fabric was used in areas where new road was constructed through dense jungle and wetlands. The fabric stabilizes road construction over very soft soils. The fabric made it possible to construct directly over the top of the poor soil. This marks the first time geotextile fabric was used on a transportation project in Jamaica.



Photo 5:

Mechanically stabilized earth (MSE) walls made of 12" x 12" concrete blocks were used to stabilize and build up the highway. Previously, stabilizing walls were constructed by hand out of bricks and mortar. This is the first use of this technology in Jamaica.



Photo 6:

A new roadway drainage system incorporated into the highway will prevent flooding on the road during heavy rains.



Photo 7:

Jamaica has a high level of seismic activity. The bridges were designed to withstand the highest level of earthquake prescribed by the government – a first for Jamaica. The bridges had deeper foundations and a restraint mechanism that held the superstructure on the substructure so the bridges would remain intact during an earthquake or hurricane.



Photo 8:

Improvements to the highway corrected deficiencies in stopping sight distance, roadway design speed, roadway width, provisions for stalled vehicles, bicycles and pedestrians and pavement surface conditions.