Jamaica

North Coast Development Project

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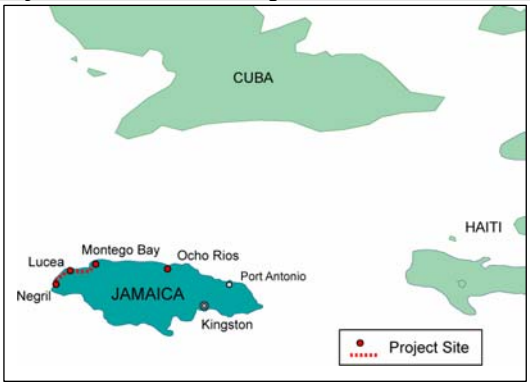
Field Survey: December 2005

1. Project Profile and Japan's ODA Loan



Map of project area

(Clockwise from upper left) A waste stabilization pond, the Northern Highway, a waste water settling tank, and Ocho Rios Port

1.1 Background

Back in the year 1987 Jamaica's tourism industry was the country's most important industry, bringing in roughly 40% of its foreign currency revenue. All of Jamaica's major tourist spots, such as Montego Bay, Ocho Rios, and Negril are located in the country's northern region. Lodging establishments like hotels have been steadily installed, yet conversely the level of development for infrastructure like roads and water supply and sewerage is extremely low within this region. This has been seen as the greatest factor threatening the ongoing growth of the tourism industry. Starting from such a situation, in 1990 a Special Assistance for Project Formation (SAPROF) study was conducted and five sub-projects were selected to promote tourism and protect tourist attractions within the northern region[1]. In addition, this project was implemented as a joint financing project with the United States Agency for International Development (USAID)[2].

1.2 Objective

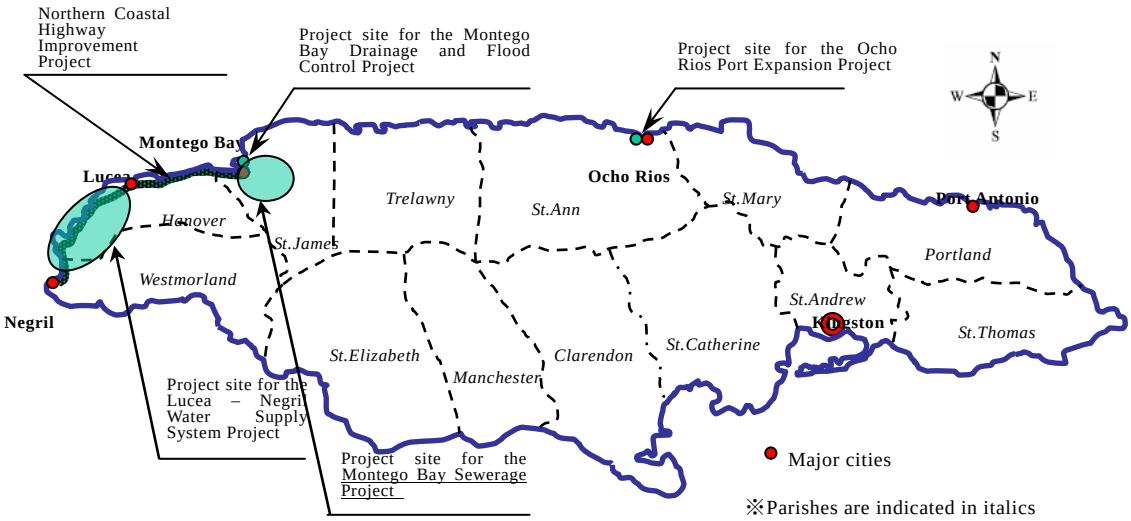
This project will develop and improve infrastructure such as water supply and

[1] The five sub-projects are: (1) the Montego Bay Sewerage, (2) the Lucea/Negril Water Supply System, (3) the Northern Highway Improvement, (4) the Montego Bay Drainage and Flood Control, and (5) the Ocho Rios Port Expansion.

[2] A portion of the operating costs for the Project Management Unit (PMU) and the implementation expenses for the Montego Bay Environmental Monitoring Program (carried out for five years from 1992-1996), among others, were funded through financing from USAID.

sewerage, roads, drainage channels, and ports with a focus on regions of Montego Bay, Ocho Rios, and Negril[3] and other areas which comprise Jamaica's major tourist spots. By doing so it aims to both increase the number of tourists and handle issues arising from this increase, thereby contributing to advancing the economic activities of the region and improving the living environment of its residents.

Fig.1 Jamaican Parishes and Project Site Locations



1.3 Borrower/Executing Agency

Government of Jamaica/National Water Commission (NWC), National Works Agency (NWA)[4], Port Authority of Jamaica (PAJ)

[3] Jamaica is comprised of 14 parishes, with the site for this project distributed over St. James Parish and three other parishes. The total surface area for these four parishes is 3,065 km^2 and their overall population is 548,000 people. The magnitude for this is roughly equivalent to the surface area of Toyama Prefecture (2,802 km^2), and to approximately half of this prefecture's population (1.12 million people).

[4] The loan agreement was signed with the Ministry of Construction (Works). However, in 2001 the NWA was created as part of public sector reforms, and this project was passed on to it.

1.4 Outline of Loan Agreement

Loan Amount Disbursed Amount	8,606 million yen/8,599 million yen
Exchange of Notes Loan Agreement	October 1991 October 1991
Terms and Conditions - Interest Rate - Repayment Period (Grace Period) - Procurement	 3.0% 25 years (7 years) General untied
Final Disbursement	September 2002
Main Agreements	Rizzani De Eccher (Italy), SOGEA-SATOM (France), others
Consulting Agreements	DHV International UK (United Kingdom), Stanley Consultants (United States), Wallace Evan Ltd. (local enterprise), others
Feasibility Study (F/S), etc.	1990 SAPROF

2. Evaluation Results

2.1 Relevance

2.1.1 Relevance at the time of appraisal

Through the Public Sector Investment Program (1990-1994) from out of production sectors such as the agriculture industry, the mining industry, the manufacturing industry, and tourism, the largest investment (approximately US$200 million) was diverted to the tourism sector, as it was planned that greater economic growth could be achieved through the tourism industry. At the time in 1987, 40% of Jamaica's foreign currency tourism revenue came from major tourist spots like Montego Bay, Ocho Rios, and Negril. Items pointed out within the Tourism Development Program (1990-1994) include: (1) the necessity of improving roads to promote tourism, (2) the necessity of improving sewerage in the Montego Bay area to protect tourist attractions, and (3) the necessity of improving facilities to eliminate inadequacies in water supply in the Negril area. As such, at the time of appraisal the inadequate infrastructure in the northern region was recognized as the greatest bottleneck to increasing revenue from tourism. The importance of this project in promoting economic growth through developing tourism and improving the living environment of residents was

exceptionally high.

2.1.2 Relevance at the time of evaluation

In the Medium Term Socioeconomic Policy Framework (2004-2007)[5], which indicates short- and medium-term policy objectives, the health and sanitation field was designated as one of the prioritized spending sectors of the medium term fiscal expenditure program. In addition, this framework advocated priority investment to the water supply and sewerage sector and the transportation sector as part of the Public Sector Investment Program. Looking at just the tourism sector, in the Master Plan for Sustainable Tourism Development (2000-2010) the three areas of Montego Bay, Ocho Rios, and Negril were designated as the three most important areas for developing tourism, and priority investment was stipulated for improving public infrastructure (water supply and sewerage, roads, ports, airports, waste disposal sites, etc.) in these areas. The various types of facilities improved through this project currently function as an important infrastructural foundation (stable supply of running water, sewage processing, continuous port calls by large-scale passenger cruise ships, etc.) and still remain extremely important now. This foundation contributes to sustainable economic growth and to sustaining the living environment in the three areas mentioned above where the number of tourists is increasing by developing tourism.

2.2. Efficiency

2.2.1. Outputs

In Table 1 the original plan and actual performance for each of the sub-projects are displayed. The NWC, which was the project's executing agency, believes that the additional drainage pipe extension for the Montego Bay Sewerage was "due to incomplete entry to the original plan, and the document failed to include the small diameter secondary drainage pipes (extensions totaling approximately 23km) at the time of appraisal. The extension length of the drainage pipes per se did not have any major alterations." Additionally, there were changes when the detailed design was submitted, and accordingly the number of pumps was increased, the treatment capacity was changed, and the construction of a sludge treatment facility was cancelled[6]. The facility capacity and differences in the extension of water

[5] Created by the joint efforts of the Ministry of Finance and Planning, the Planning Institute of Jamaica, and the Bank of Jamaica (BOJ) through assistance by the European Commission (EC), and was based upon the National Industrial Policy that was formulated in 1996.

[6] The planned construction of the sludge treatment facility was altered after nine alternative proposals were offered by consultants at the time of the detailed design, still including the sludge treatment facility as one option. However, the determination was made that "treatment by waste stabilization ponds would be best" from the point of view of economical and other reasons.

distribution pipes in the sub-project for the Lucea/Negril water supply system were also brought about by the design alterations from the time of the detailed design[7]. For each of the other projects; 3), 4), and 5), improvements to facilities and similar installations generally went as planned.

Table 1. Output Comparison

Sub-Project Name (Agency in Charge) and Items	Planned	Actual Performance
(1) Montego Bay Sewerage (NWC)		
Construction of drainage pipes (recovery system)	Drainage pipe extension: 7.9km in total	33.6km in total
Construction of pump facility	Number of pumps: 2	5
Construction of central treatment facility	Treatment capacity: 7.2 imgd[8]	10.0 imgd
Construction of a sludge treatment facility	To be constructed within the central treatment facility	Cancelled, changed to a stabilization pond
(2) Lucea/Negril Water Supply（NWC）		
Construction of water intake and purification facility	Facility capacity: 5.0 imgd	7.5 imgd
Construction of water distribution facility	Extension of water distribution pipes: 21.2km in total	27.1km in total
(3) Northern Highway Improvement (NWA)[9]		
Improvement of the highway between Negril and Montego Bay	Total extension:73.3km	71.2km
(4) Montego Bay Drainage and Flood Control (NWA)		
Construction of drainage channels, drains, settling tanks, etc.	Total extension:1,127m	1,073 m[10]

[7] The facility for this project was newly constructed adjacent to the previous facility (water supply capacity of around 3.5 imgd). The water intake sources for the new facility are a spring water source called the Blue Hole and river surface water (from the Orange River). From among these the acceptable water intake amount from the Blue Hole, which was also the water intake source for the previous facility, was revised, thereby altering the facility's capacity to 7.5 imgd. While the previous facility was closed after the new facility went into operation there are some plans to reuse portions of this facility (according to the NWC).

[8] 1.0 imgd (the abbreviation for imperial million gallons per day) is approximately 4,550 tons per day.

[9] At the time of appraisal the overall planned stretch for the Northern Coastal Highway Improvement Project was 268 km between Negril and San Antonio. From out of this stretch this sub-project focused on the portion between Negril and Montego Bay (approximately 73 km) referred to as Segment I.

[10] For some sections open channel-style drains were planned to be used, but the layout was altered to use the land more effectively above the drains and box culvert-style drains came to be used instead.

(5) Ocho Rios Port Expansion (PAJ) Expansion of the second landing pier of a passenger ship terminal, etc.	To allow large-scale passenger ships of up to 900 feet (about 275 meters) in size to make berth	Large-scale passenger ships of up to 1,020 feed (about 311 meters) in size are able to make berth[11]

Source: NWC, NWA, and PAJ

2.2.2 Project period

The planned period at the time of appraisal was for 59 months from November 1991 to October 1996. But in actuality it lasted until September 2002 and required 130 months, producing a delay of 71 months (about 6 years). Of the sub-projects, the Northern Highway Improvement fell the most behind (with a delay of 71 months), with the main reason for this being the construction delays which followed after the contractor (a construction company) went bankrupt. Following this, there were lengthy holdups (67 months) in the Montego Bay Drainage and Flood Control, the main reason being the annulment of the contract with the contractor arising from its poor performance, which caused the further delays in construction work. In addition, the delays to the Lucea/Negril Water Supply System (59 months) were primarily caused by delays on the Jamaican side to prepare the local currency allowances.

[11] In 2006 port calls from even larger sized passenger ships (total length of 1,112 feet, or about 340m) are scheduled.

Table 2. Implementation Period Comparison

Sub-Project Name	Planned	Actual Performance
1) Montego Bay Sewerage	November 1991-October 1996	November 1991-January 1999
2) Lucea/Negril Water Supply	November 1991-July 1996	November 1991-June 2001
3) Northern Highway Improvement	November 1991-October 1996	November 1991-September 2002
4) Montego Bay Drainage and Flood Control	November 1991-May 1996	November 1991-October 2001
5) Ocho Rios Port Expansion	November 1991-August 1995	November 1991-January 1998
Projects as a Whole	November 1991-October 1996	November 1991-September 2002

Source: NWC, NWA, and PAJ
Note: The loan agreement was signed on October 29, 1991

2.2.3 Project cost

The total project cost inflated up to 27,346 million yen, or roughly 2.4 times the initially planned amount of 11,474 million yen. The primary causes for this are: (1) expenses associated with finding replacement contractors in the wake of the bankruptcy of contract annulment with the original contractors (expenses related to rebidding, etc.) and (2) additional expenses incurred through the project drastically exceeding its implementation period.

Table 3: Project Cost Comparison

(Values in parenthesis represent the Japan's ODA loan amount; Unit: 100 million yen)

Sub-Project Name	Planned		Actual Performance	
(1) Montego Bay Sewerage	25.50	(18.66)	42.79	(19.24)
(2) Lucea/Negril Water Supply	17.31	(11.68)	46.47	(12.86)
(3) Northern Highway Improvement	36.90	(24.98)	149.67	(27.67)
(4) Montego Bay Drainage and Flood Control	9.21	(5.97)	26.95	(8.99)
(5) Ocho Rios Port Expansion	8.91	(6.01)	7.59	(6.22)
(6) Consulting service and other fees	16.91	(10.16)	Included in the above	(11.01)
Total	114.74	(86.06)[12]	273.46	(85.99)

Source: NWC, NWA, PAJ, and JBIC data

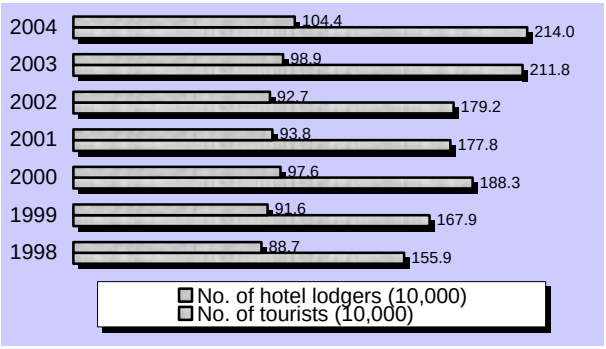
Note: Figures below the unit of 1 million yen were rounded up, and as a result may not agree with the total in all instances.

2.3 Effectiveness

2.3.1 Increasing the number of tourists

From 1998 when the Ocho Rios Port Expansion was completed (the fastest to be completed from among the sub-projects) to the present, the number of tourists and hotel lodgers in the three areas targeted by the sub-project (Montego Bay, Ocho Rios, and Negril) has shown largely favorable growth (Figure 2).[13] Especially since 2002, by which time all of the sub-projects had been completed, the number of tourists and hotel lodgers has been growing sharply.

Fig. 2 Number of Tourists and Hotel Lodgers in the 3 Target Areas



Source: Created from Jamaica Tourist Board data

[12] Includes contingency costs of 860 million yen.

[13] It is believed that the drop in the number of tourists in 2001 and 2002 was mainly caused by the temporary decrease in passenger cruise ships that accompanied the terrorist attacks of September 11.

In specific terms, from 1998 to 2004 a substantial increase of 37% was achieved in the number of tourists. At the same time, however, the number of hotel lodgers remained at a growth rate of 18%. Because the growth rate for hotel guest rooms for the three regions as a whole during the same period was 10.8%[14] it can be concluded that the number of hotel guest rooms has remained in short supply and caused the slow growth in the number of hotel lodgers.

[14] From Jamaica Tourist Board (JTB) data.

2.3.2 Montego Bay Sewerage

2.3.2.1 Sewage treatment volume and facility utilization rate

The sewage treatment volume has not shown any signs of increasing since 2001[17]. Currently, as of the sixth year since the commencement of operations a facility utilization rate has never reached 40% (Table 4). It is believed that the target values for the sewage treatment volume and the facility utilization rate were not clearly-defined at the time of appraisal[18].

Table 4. Sewage Treatment Volume and Facility Utilization Rate

Year	Average Water Treatment Volume imgd (tons per day)		Facility Utilization Rate[15] (%)
2001	2.59	(11,800)	25.9
2002	2.64	(12,000)	26.4
2003	3.63	(16,500)	36.3
2004	2.74	(12,500)	27.4
2005	2.91	(13,200)	29.1

Source: NWC

Note: Data from January-April 2001 is not included

2.3.2.2 Population with sewage treatment and the sewerage diffusion rate

Owing to factors such as the frequency with which the census is performed and the lack of highly-reliable data only the three years of 1996, 2001, and 2002 were computed. The population with sewage treatment has increased since the facility went into operation in 1999, but the diffusion rate is stuck at a meager 14%. Moreover, the diffusion rate is significantly below the national average (about 20%) (Table 5).

Table 5. Population with Sewage Treatment and the Sewerage Diffusion Rate

Year	Population with Treatment[16] (people)	Sewerage Diffusion Rate (%)
1996	17,800	11.0
2001	23,800	13.6
2002	24,000	13.6
2001 (nation wide)	550,100	21.1

Source: Created from 2001 census and other data

Note 1: Data for the whole St. James Parish

Note 2: The population with treatment was computed from census data; the 1996 sewerage diffusion rate substitutes the diffusion rate for urban areas outside of Kingston (italicized part)

[15] Facility utilization rate (average) = average volume of water treated/facility capacity x 100 (the average volume of water treated is the figure obtained by taking a daily average from the total sewage treated per year)

[16] In 2001 the population for the Montego Bay area was roughly 96,500 people.

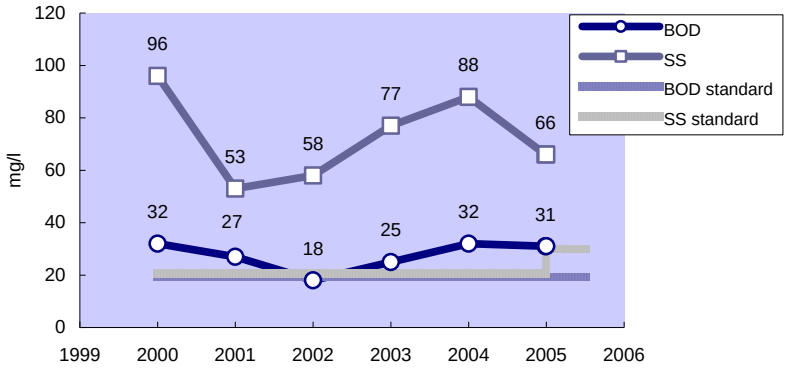
[17] Even though the facility was completed in January 1999, the data received was from May 2001 onward. The NWC which served as the executing agency claims that "data from prior to April 2001 was not recorded."

[18] The documents used for appraisal stated that "a facility will be built to handle the predicted population of 250,000 people for the Montego Bay region in the year 2015," but did not clearly specify planned values.

2.3.2.3 Concentrations of BOD and SS[19]

The concentrations of SS from 2000 to 2005 vastly exceeded the National Environment and Planning Agency (NEPA)'s standard for wastewater of 20 mg/l (30 mg/l from 2005 on). In 2002 the concentration of BOD just barely managed to stay below the standard for wastewater, but was slightly over the base value in other years (Figure 3).

Fig. 3 Trends in the Concentrations of BOD and SS



Source: NWC, NEPA

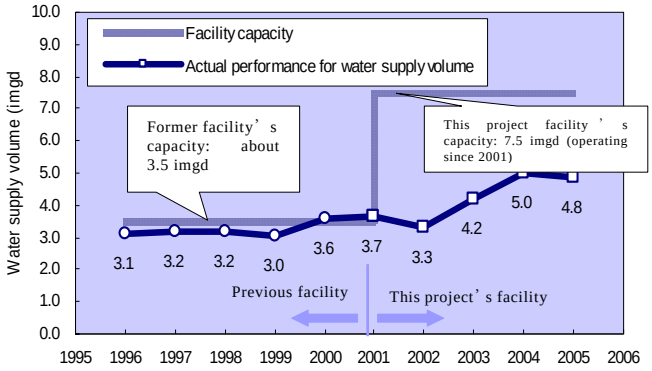
The NWC is of the opinion that "algae clustered together in stabilization ponds and the like has a major impact on the concentrations of both BOD and SS, particularly for BOD concentrations which are 70-80% determined by the impact from algae."

[19] BOD stands for biochemical oxygen demand and SS for suspended solids.

2.3.3 Lucea/Negril Water Supply

2.3.3.1 Volume of clean water supplied

Table 4. Trends in the Volume of Clean Water Supplied



Source: NWC

Regions to which water service was supplied through this project are Lucea and areas to its west in the Hanover Parish, as well as the Negril area within Westmoreland Parish. According to the plan, an average water supply volume of 4.3 imgd (about 20,000 tons per day) was supposed to be maintained in the second year after project completion. In 2003, the second year after project completion the actual performance for water supply (4.2 imgd) largely achieved the goals as planned, and since then the water supply volume has been on an increasing trend (Figure 4). As has been pointed out already in the section on Efficiency, the facility for this sub-project was newly constructed adjacent to the previous facility, which was closed after the new facility went into operation. Actual performance for water supply as of 2005 was one and a half times the average performance for water supply of the previous five years (1996-2000) by the previous facility of 3.2 imgd.

2.3.3.2 Water supplied population and the water supply diffusion rate

Because the census was not performed often and there was no reliable data to substitute it, only the three years of 1992, 1998, and 2001 were computed.[20]

Both the water supplied population and the water supply diffusion rate have been growing within these parishes since 1992. However, their water supply diffusion rate was below the national average (roughly 66%) in 2001, the year the project was completed. Conversely, limiting the focus to just the Lucea and Negril areas shows that both of their water supply diffusion rates were over the national average in 2001 (Table 6).

Table 6. Trends in the Water Supplied Population and the Water Supply Diffusion Rate

Year	Hanover Parish (where the Lucea area is located)		Westmoreland Parish (where the Negril area is located)	
	Water Supplied Population (people)	Water Supply Diffusion Rate (%)	Water Supplied Population (people)	Water Supply Diffusion Rate (%)
1992	12,700	18.9	43,800	33.6
1998	30,100	42.2	68,600	49.6
2001	32,200	48.0	71,200	51.3
2001 (Lucea)	4,180	69.0	-	-
2001 (Negril)	-	-	4,330	76.3
2001 (nation wide)	1,732,000	66.4	1,732,000	66.4

Source: Created from 2001 census and other data
Note: The water supplied population for 1992 and 1998 are estimated values (calculated from the water supply diffusion rate)

[20] For 1992 and 1998 the only data that could be obtained was that for the water supply diffusion rates for Hanover (in which the Lucea area is located) and Westmoreland (in which the Negril area is located) Parishes as a whole. Regarding 2001 as well, census results revealed the number of households to which water supply had spread to in both the Lucea and Negril areas. From this number of households the water supply diffusion rate and water supplied population were computed.

2.3.3.3 Facility utilization rate

The plan stipulated that a utilization rate of 57% had to be maintained in the second year after the completion of the project. Since operation commenced in 2001 the utilization rate has been on a rising trend, with a 56% rate achieved in 2003, the second year after project completion. At present the rate has climbed into the 60% range (Table 7).

2.3.3.4 Non-revenue water rate

Despite the fact that since the completion of the project the non-revenue water rate for Hanover Parish in which the Lucea area is located has been on a slightly decreasing trend, as of 2005 the non-revenue water rate is still standing at 57% (Table 7). While this is below the national average it remains at a high level. At the time of appraisal the plan did not clearly define the target values for the non-revenue water rate after project implementation. The high levels for non-revenue water rates in the northwestern regions of Jamaica, including Hanover Parish, can be attributed to: (1) a lack of installed meter equipment and meter equipment calculation errors, and (2) non-payment of bills, among others[23].

Table 7. Facility Utilization Rate and Non-revenue Water Rate

Year	Facility Utilization Rate[21] (%)	Non-revenue Water Rate (%)
2001 (project completed)	48.9	65.0
2002	44.1	59.3
2003	56.1	54.7
2004	66.5	58.9
2005	64.4	56.7
2004 (nationwide)	—	66.2

Source: NWC

Note: The non-revenue water rate is from data Hanover Parish as a whole[22].

[21] Facility utilization rate (average) = average water supply volume per day/facility capacity × 100

[22] The data includes the entire parish, and there is no statistics for the non-revenue water rate that distinguish the water supplied regions (the Lucea area and areas in its west in the Hanover Parish, as well as the Negril area) from the rest.

[23] As indicated within the report entitled NWC Review of Rates Determination Notice created in 2003 by the Office of Utilities Regulation, which sets the standards for water rates in Jamaica.

2.3.4 Northern Highway Improvement

2.3.4.1 Reducing the required driving time

Based on hearings with the NWA, the project's executing agency, as well as interview surveys [25] with the beneficiaries, it came to light that the required driving time between Negril and Montego Bay (approximately 71km) after project implementation was somewhere in the range of 45 minutes to 1 hour. This indicated that as a result of this project the driving time was reduced by 1 hour to 1 hour and 15 minutes (previously about 2 hours). The required driving time between Negril and Montego Bay has been substantially reduced as a result of the completion of the two lane high-standard highway[26].

Table 8. Structure of Water Rates in Jamaica[24]

Type of Customer	Monthly Usage (Unit: gallon)	Monthly Rate per 1,000 gallons (Unit: Jamaica dollar)
Average households	Up to3,000	108.39
	Up to 6,000	191.98
	Up to 9,000	206.31
	Up to 12,000	263.33
	Up to 20,000	327.96
	20,000 or more	422.14
Businesses, etc.	Flat rate	406.43
Condominiums	Flat rate	201.61
Schools, etc.	Flat rate	162.58

Source: NWC (rates were set in January 2004)

Note: 1 imperial gallon is approximately 4.5 liters

2.3.4.2 Increasing the average annual traffic volume

Following the improvements to the highway the traffic volume has been increasing substantially compared to before the project was begun (Table 9). The increase is particularly prominent in the Negril area.

[24] Waste water rates are comprised of the two items of: (1) a service charge and (2) a "assumption system" whereby 100% of the supplied water quantity become wastewater, which then charges for the same amount. The water rate structure is the same as in Table 8. Moreover, the NWC has adopted a price adjustment mechanism to link the water price with the consumer price index.

[25] Surveys were performed by means of face-to-face style interviews with minibus drivers and residents at three bus terminals between Negril and Montego Bay and in the central part of the Montego Bay region.

[26] In the interview surveys with the beneficiaries, out of the number of valid responses of 65, 54 of the people (roughly 83%) responded that "The current required driving time between Negril and Montego Bay is one hour or less." In addition, according to the evaluators the average of actual measurements for the required driving time was roughly 55 minutes (average value from three round trips).

Table 9. Annual Average Traffic Volume at 3 Points along the Stretch

Year	Negril	Reading	Montego Bay
1994	1,800	6,400	12,500
2002	5,337	8,064	23,819
Rate of Increase	197%	26%	91%

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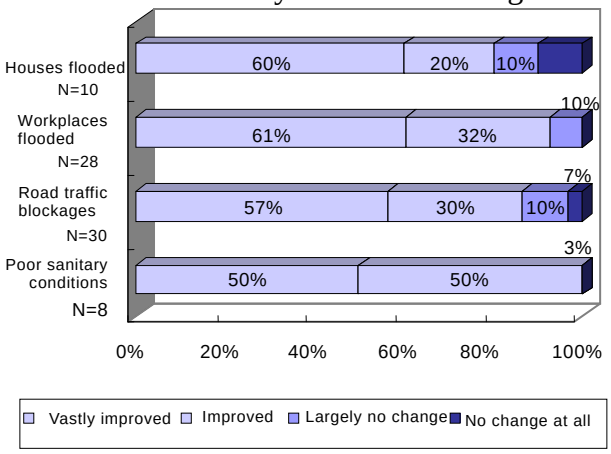
Source: NWA
Note: The traffic volume is the average annual daily traffic (AADT) figure, and data for 2002 is from after project completion

2.3.5 Montego Bay Drainage and Flood Control—alleviating flood damage

The results of interview surveys with beneficiaries[27] are displayed in Figure 5. Questions were asked to households who responded that, before the project, they had experienced damages of: (1) flooding of houses, (2) flooding of workplaces, (3) road traffic blockages, and (4) poor sanitary conditions, and 80% or more of them indicated an improvement in conditions. The construction of drains has substantially alleviated flood damage in the central part of the Montego Bay region.

Fig. 5 Results of a Resident Opinion Survey on Flood Damage



Source: Results of interview surveys with beneficiaries (number of valid household responses: 43, with multiple answers)

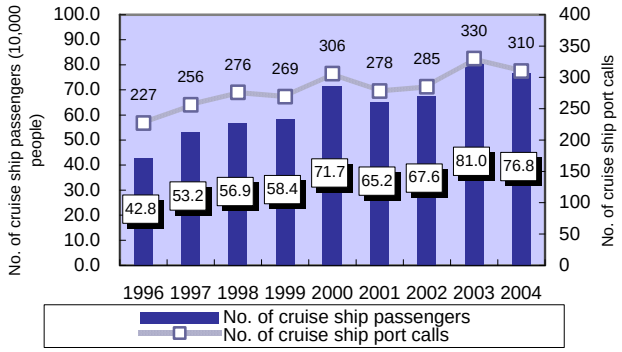
[27] Surveys were performed by means of face-to-face style interviews in the areas (areas surrounding the South Gully zone, both the Peoples Arcade and Creek Street districts in the central part of Montego Bay, etc.) along which drains were newly installed through this project.

2.3.6 Ocho Rios [28] Port Expansion

2.3.6.1 Increasing the number of travelers

Fluctuations in the number of travelers have been observed in the last several years due to the effects of the terrorist attacks of September 11 (in 2001) and the increasing frequency with which large hurricanes hit[29]. However, generally speaking, the number of cruise ship passengers has been on an increasing trend since the project was completed in 1998 (Figure 6)[30]. In 2003 Jamaica achieved a record high of 810,000 people, with a rate of growth of 35.1% between 1998 and 2004.

Figure 6: Number of Cruise Ship Passengers and Port Calls



Source: Lannaman & Morris Ltd. and the JTB

2.3.6.2 Increasing the number of port calls by excursion cruise passenger ships

The number of passenger cruise ships making port calls was 330 ships in 2003, marking a record high (Fig. 6). Despite the fact that some port calls were cancelled due to hurricanes and heavy weather, the number of port calls has been on an increasing trend since the completion of the project in 1998. Between 1998 and 2004 the rate of growth was 12.3%.

The state of use of the piers is extremely favorable, and there are even cases where port call requests are turned down due to congestion in the peak season (December-April)[31].

2.3.7 Economic Internal Rate of Return (EIRR)

The Economic Internal Rate of Return (EIRR) was recalculated using the total construction expenses, as well as operation, maintenance, and management

[28] Ocho Rios is known as the main port of call for Caribbean Sea cruises. Ocho Rios Port only has the terminal capability for passenger cruise ships.

[29] It is speculated that the drop in the number of cruise ship passengers in 2001 and 2002 was mainly caused by the temporary decrease in American tourists that accompanied the terrorist attacks of September 11. Additionally, the drop in 2004 was the result of the impact from the large Hurricane Ivan and others.

[30] In 2000, 142,000 ton large-scale passenger ship (total length of 311 m, passenger capacity of 3,114 people), the world's largest class at the time, began making port calls. The number of cruise ship passengers soared from the 500,000 range all at once to the 700,000 range.

[31] According to L&M Ltd., the company consigned to operate the cruise terminal by the PAJ (the executing agency for this project), "The popularity of Ocho Rios Port is extremely high among cruise companies. There have been times when we have received bookings in excess of the number of ships which can call at the port per day (up to three ships, or two large-scale passenger ships). There are also numerous cases where we have to turn down bookings out of necessity."

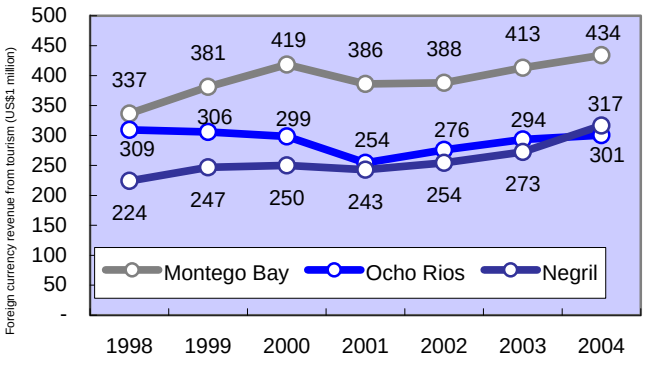
expenses from each sub-project as the cost, and the increment of foreign currency revenue from tourism in the three targeted areas as the benefit[32]. This figure came to 35.6%, which slightly exceeds the 34.2% EIRR estimated at the time of appraisal. The plan included the whole of Jamaica when calculating the increment in foreign currency revenue from tourism at the time of appraisal, and it cannot be compared straightforwardly to the aforementioned figure for EIRR. But it recorded an exceptionally high figure because: (1) the number of tourists increased largely according to plan from the time of appraisal, and (2) the amount of tourism consumption per person per day rose to roughly twice the amount predicted at the time of appraisal (year 2000).

2.4 Impact

2.4.1 Developing the regional economy—increasing the foreign currency revenue from tourism

From 1998 when the Ocho Rios Port Expansion was completed until the present, foreign currency revenue from tourism has been growing quite favorably in the two areas of Montego Bay and Negril (Figure 7)[33]. The amount of revenue has been growing rapidly, especially since 2002, by which time all of the sub-projects had been completed. Regarding these two regions it could be said that the infrastructural foundation has improved through this project and is supporting the tourism industry.

Fig. 7 Trends in the Foreign Currency Revenue from Tourism in the 3 Target Areas



Source: JTB

For Ocho Rios, on the other hand, as a result of large-scale passenger cruise ships starting to call at port in 2000 the total number of tourists is increasing favorably (880,000 people in 1998 to 1.07 million in 2004: a roughly 21%

[32] The evaluation period was set as 25 years. The increment in foreign currency revenue from tourism was estimated from data such as the actual change in foreign currency revenue from tourism in the three targeted areas from before and after project completion.

[33] It is believed that the drop in foreign currency revenue from tourism in Montego Bay and Ocho Rios from 2001 to 2002 was primarily caused by the reduction in cruise ship passengers that resulted from the September 11 terrorist attacks.

increase). Yet conversely the number of hotel lodgers decreased by 5% (315,000 people in 1998 to 298,000 in 2004)[34]. The number of day-trip cruise ship passengers is continuously increasing as passenger cruise ships grow in size and the number of port calls increase. Yet the amount of consumption per cruise ship passenger is low compared to that of the overnight guests[35] and this changing trend is not linked to an increase in tourism revenue. As a result, tourism revenue is growing sluggishly.[36, 37]

2.4.2 Developing the regional economy—increasing the number of jobs in tourism

Trends in the number of jobs by industry from the years 1997 to 2003 are indicated in Table 10. Looking at trends in the number of jobs by primary, secondary, and tertiary sectors of industry shows that since 1997 the number of jobs in the primary and secondary sectors of industry have been on a decreasing trend. In contrast, the number of jobs in the tertiary sector of industry, which encompasses the tourism industry, has been increasing by 3.9% relative to 1997.

The average rate of growth in the number of jobs for the hotel industry in particular which forms the backbone of the tourism industry, was above rate for the third sector of industry, recording an increase of 5.3% over the same period. Also since 2002, by which time all of the sub-projects had been completed, the rate of growth has reached 6.4%.

[34] Data source: The JTB

[35] The average amount of consumption per overnight guest was roughly US$1,000 (average nights stayed is 9.9 nights per person, average amount of consumption per night stayed is US$102, both values from 2004 data). While statistics related to the average amount of consumption per cruise ship passenger have not been kept, in light of the fact that they return the same day it is supposed that they spend considerably less than overnight guests.

[36] In terms of patterns in cruise ship passengers' consumption behavior, they include: (1) participation in various types of day-trip tours held by local tour companies (in Ocho Rios tours such as climbing Dunn's River Falls, swimming with dolphins at the Dolphin's Cove water park, and various types of scuba diving tours are popular, with fares ranging from around US$50-100 per person) and others, (2) attractions at the beaches (snorkeling, water skiing, parasailing, swimming, etc.), and (3) shopping at the duty-free shops in the center of Ocho Rios.

[37] When passenger cruise ships grow in size, ports are susceptible to such risks as opportunity loss created by ships canceling port calls during hurricane season and in heavy weather. Ocho Rios Port does not have any bulwarks, and it has been said that during heavy weather the port call cancellation rate is high (from the results of interviews with L&M Ltd., which manages the terminal; when cancellations occur, some ships are brought into Montego Bay Freeport, which is less subject to the effects of waves). While the number of passengers per ship is increasing, the risk of opportunity loss when port call cancellations arise is also enlarging.

Table 10. National Trends in the Number of Jobs by Industry (Unit: one person)

Year	Primary Sector of Industry	Secondary Sector of Industry	Tertiary Sector of Industry	Hotel Industry from among Tertiary Sector of Industry
1997	202,700	172,300	581,300	28,976
2000	194,500	152,900	588,200	30,108
2002	182,400	158,900	601,000	30,434
2003	191,800	159,200	603,900	30,512
2004	-	-	-	30,999
Rate of Increase from 1997 to 2003	-5.4%	-7.6%	3.9%	5.3%

Source: Created from the Planning Institute of Jamaica (PIOJ)'s 2005 Jamaica Human Development Report
(Figures for the hotel industry also incorporate data from the JTB)

As has been pointed out already in the section on Effectiveness, since the completion of this project the number of tourists has been rapidly increasing. Moreover, based on the abovementioned facts it could be said that "the increase in tourists generated new employment opportunities in the hotel industry, therefore this project is supporting the tourism industry in terms of employment" for the two regions of Montego Bay and Negril in particular. Additionally, according to interview surveys with beneficiaries in the Ocho Rios region, accompanying the increase in cruise ship passengers new employment is being generated at local tour companies and at newly constructed shopping centers[38].

2.5 Sustainability

2.5.1 Executing agency

Operation, operation and maintenance operations were carried out by the NWC for the Montego Bay Sewerage and the Lucea/Negril Water Supply System, by the NWA for the Northern Highway Improvement and the Montego Bay Drainage and Flood Control, and by the PAJ for the Ocho Rios Port Expansion, respectively. Below is an evaluation of each executing agency.

[38] According to the Jamaica Union of Travelers Association (JUTA), Jamaica's largest excursion tour company, this area newly hired 300 drivers following the completion of the Ocho Rios Port Expansion. Moreover, in interviews with the Ocho Rios Chamber of Commerce it was mentioned that approximately 200 local residents were newly hired at multiple large-scale shopping centers located in the vicinity of the passenger cruise ship terminal.

2.5.1.1 Technical capacity

(1) NWC

There were no technical or personnel problems related to the operation, maintenance, and management of various facilities such as water intake, cleaning, and the distribution network for water supply; nor for sewage treatment facilities and drainage pipe lines for sewerage. The NWC's Western Division, which is in charge of operation and maintenance activities, has abundant experience regarding operation, maintenance, and management for most of the water supply and sewerage plants, and there is no problem with their technical level. In addition, the consultants in charge of both the Montego Bay Sewerage and the Lucea/Negril Water Supply System created manuals for their operation, maintenance, and management. In terms of personnel, the technical services department (65 employees) of the Western Division is in charge of the operation and maintenance of both water supply and sewerage facilities[39]. The sewerage team (14 employees) for the St. James/Trelawny regional section is in charge of the operation of sewerage facilities, and the water supply team (39 employees) for the Hanover/Westmoreland regional section is in charge of operation for the water supply facilities.

(2) NWA

There were almost no technical or personnel problems related to the operation and maintenance of the Northern Highway (between Negril and Montego Bay). Concerning technical aspects, the consultant in charge of the project created operation and maintenance manuals, and training is carried out related to operation and maintenance[40]. Moreover, operation and maintenance operations began to be outsourced to the private sector from three years ago. On the abovementioned stretch of road, road paving and four other types of operation and maintenance operations have been outsourced[41]. In terms of personnel, there are 109 employees on the roster at the NWA's Directorate of Regional Implementation, which is in charge of operation and maintenance activities. Every one of the 18 engineers in a managerial-level position has received a college education.

[39] The Maintenance Manager of the NWC's Western Division (who overseas the maintenance engineers that belong to the technical services department) is the one responsible for operation and maintenance operations on the water supply facilities for Lucea and Negril, and the sewerage facilities for Montego Bay. This person took part in a JICA training program in which he is receiving training in Japan for the operation and maintenance of water supply facilities.

[40] Through the assistance of the Inter-American Development Bank (IDB) the National Road Services Improvement Programme has been carried out since 2002. For the fledgling NWA, the program scope incorporates: (1) enhancing its organizational capacity, (2) improving operation and maintenance operations, and (3) the systemization of planning for road repair. Through these activities, the program aims for enhancing the capacity of NWA employees.

[41] The objective of the aforementioned IDB program is further increasing the efficiency of private sector consignment for operation and maintenance operations (such as the introduction of performance-based contracts).

The Directorate of Regional Implementation mentioned above is also in charge of the operation and maintenance of facilities for the Montego Bay Drainage and Flood Control, and there are absolutely no problems with their technical level or personnel.

(3) PAJ

In terms of the operation of Ocho Rios Port's passenger cruise ship terminal, PAJ and Lannaman & Morris (L&M) Ltd.[42] has entered into a concession contract, and the private sector is now in charge of this outsourced work of maintenance. L&M Ltd. also performs the port management for the Port of Kingston in a similar manner by means of the concession contract. Because they are proficient in port management operations in Jamaica[43] there are absolutely no problems with their technical levels or personnel. At these companies' offices at the passenger cruise ship terminal at Ocho Rios Port there are eight employees on the roster, including two people in management positions.

2.5.1.2 Operation and maintenance

(1) NWC

The NWC has two regional divisions, each of which is responsible for conducting operation, maintenance, and management activities in half of Jamaica. Areas in the eastern part including the capital city Kingston and Ocho Rios are managed by the Eastern Division, and areas in the western part including tourist spots like Montego Bay and Negril are managed by the Western Division. The Montego Bay sewerage facilities and the Lucea/Negril water supply facilities are under the jurisdiction of the Western Division[44].

(2) NWA

The regional taskforce team of the project agency is in charge of the operation and maintenance of roadway infrastructure and the facilities around the country. The regional taskforce team has four divisions (northeast region, central region, western region, and metropolitan Kingston). The Northern Highway between Negril and Montego Bay and the drainage facilities in Montego Bay are under the

[42] Established in 1973, L&M is Jamaica's largest port and harbor management company. It has affiliate relations with the major marine shipping company Evergreen Line and the cruise leader Carnival Cruise Lines.

[43] Through these concession contracts L&M Ltd. handles roughly 70% of the cruise ship passengers for Jamaica as a whole.

[44] In addition to technical branches like the technical services department, there is also a customer service department (70 employees) in the Western Division which handles customer-related services. This department is in charge of activities for diffusing sewerage connections, activities for collecting fees, and measures to combat water theft.

jurisdiction of the Western Division[45].

(3) PAJ

As previously noted, the operation of the passenger cruise ship terminal is handled by the private enterprise L&M Ltd. through a concession contract.[46] In terms of operation and maintenance, relatively large-scale operation and maintenance activities like repairing the piers and replacing fences is under the charge of the PAJ, while L&M Ltd. manages small-scale operation and maintenance activities such as the cleaning inside the terminal.

2.5.1.3 Financial status

(1) NWC

Following the introduction of international accounting standards (International Financial Reporting Standards [IFRS]) in 2003, the NWC asset was reevaluated. This resulted in fixed assets increasing by approximately 2.5 times the previous year, which was accompanied by a rapid increase in cost depreciation. Moreover, the NWC started to include accrued allowances for retirement in its account from 2003, and when we look at the following table, we can see some indicators that are showing a deteriorating trend (Table 11).

Table 11. Actual Performance in the NWC's Financial Status and Various Indicators

Unit: 1 million Jamaica dollars

Accounting Year/Item	2001	2002	2003	2004
Total Capital	8,818	12,400	28,161	27,635
Current Assets	2,580	2,242	2,912	1,876
Fixed Assets	6,238	10,158	25,249	25,759
Current Liabilities	2,065	1,577	1,701	1,421
Accrued Retirement Allowances, etc.	-	-	9,780	10,618
Capital	6,607	8,673	15,475	10,425
Sales	4,731	4,797	5,146	6,124
Depreciation	250	485	1,429	1,453
Current Net Earnings	51	-695	-2,112	-1,857
Return on Assets (%)	0.6	-5.6	-7.5	-6.7
Total Capital Turnover Rate	0.54	0.39	0.18	0.22
Income Sales Ratio	1.1	-14.5	-41.0	-30.3

[45] The area under the charge of the Western Division is the three parishes of St. James, Hanover, and Westmoreland.

[46] Ocho Rios Port only has the capabilities of a passenger cruise ship terminal, and does not handle cargo. The PAJ has entrusted general operation activities of this port to L&M Ltd.

(%)				
Current Ratio (%)	124.9	142.1	171.2	132.0
Capital Ratio (%)	74.9	69.9	55.0	37.7

Source: Created from the NWC Annual Report

From a security standpoint, while the capital ratio is declining precipitously this is associated with alterations to the aforementioned accounting standards. Following these alterations it has been holding at around 40% (as of 2004). Moreover, the current ratio remains above 130% and there are almost no problems with short-term cash flow. From the standpoint of profitability, cost depreciation has been rising rapidly as a result of the alterations to the accounting standards, due to which net earnings have been running a substantial deficit over the last two year period. Some critics point out that "the NWC has to achieve sustainable growth of its capital ratio, and decrepit facilities require capital investment to be repaired. Considering all these factors, the desired level for current earnings is 600 million Jamaica dollars." Because of this, prompt improvement of the NWC's financial standing is desirable. Conversely, the return on assets, the income sales ratio, and the total capital turnover rate from 2003 to 2004 have all improved, indicating that profits are being produced along with the progression of facility use.[47]

(2) NWA

The NWA is an organization that was established in 2001 as part of public sector reforms. Looking at indicators, we have to conclude that it will need time to establish a solid financial foundation.

From a security standpoint, the capital ratio is currently rapidly declining to one third that of 2001, with the current ratio approaching 100% as well. From the standpoint of profitability, the net loss is gradually increasing, and the return on assets, income sales ratio, and the total capital turnover rate are all on an ever-worsening bent. The NWA has not achieved financial independence because of its obligation to allocate a portion of income from fees to the national treasury and restrictions on the use of this income. Although it is managing to break even due to subsidies from the government, the amount of subsidies is increasing each year.

[47] As a result of revisions to water rates that were conducted in January 2004, sales for the year 2004 increased by a rate of 19% compared to the previous year. For the future, the NWC is planning to strengthen countermeasures for issues like non-revenue water, such as newly installing meters and replacing old ones, as well as measures to combat water theft. If progress can be made in lowering the non-revenue water rate, it is projected that further increases in revenue can be achieved in the future.

Table 12. Actual Performance in the NWA's Financial Status and Various Indicators

Unit: 1 million Jamaica dollars

Accounting Year/Item	2001	2002	2003	2004
Total Capital	376	670	1,065	1,180
Current Assets	192	526	909	1,040
Current Liabilities	98	372	719	877
Capital	278	298	346	303
Sales	277	390	342	189
Current Net Earnings	-301	-361	-411	-479
Government Subsidies	383	386	422	442
Return on Assets (%)	-80.0	-53.9	-38.5	-40.6
Total Capital Turnover Rate	0.74	0.58	0.32	0.16
Income Sales Ratio(%)	-108.5	-92.6	-120.1	-253.2
Current Ratio (%)	197.2	141.6	126.4	118.6
Capital Ratio (%)	74.0	44.5	32.5	25.7

Source: Created from the NWA Annual Report

(3) PAJ

Following the introduction of international accounting standards in 2003, the PAF asset was reevaluated. This resulted in fixed assets increasing by approximately 1.4 times the previous year, which was accompanied by roughly a 30% increase in cost depreciation.

From a security standpoint, although the capital ratio is holding at around 40% the current ratio is below 100%. In addition, the quick asset ratio is extremely low and there are concerns over the short-term cash flow. From the standpoint of profitability, return on assets and income sales ratio are dropping sharply. But the total capital turnover rate has moved upward from 2003, and profits are being produced along with the progression of the use of facilities like the Ocho Rios Port.

Table 13. Actual Performance in the PAJ's Financial Status and Various Indicators

Unit: 1 million Jamaica dollars

Accounting Year/Item	2001	2002	2003	2004
Total Capital	10,965	14,252	20,088	21,135
Current Assets	824	1,143	1,843	1,921
Fixed Assets	10,141	13,109	18,246	19,214
Current Liabilities	954	1,872	1,876	2,835
Capital	5,471	5,484	9,072	8,345
Sales	1,942	2,064	5,264	6,220
Recurring Expenses	1,557	1,390	3,510	4,407
Depreciation	498	456	604	622
Current Net Earnings	328	373	379	152
Return on Assets (%)	3.0	2.6	1.9	0.7
Total Capital Turnover Rate	0.18	0.14	0.26	0.29
Income Sales Ratio (%)	16.9	18.1	7.2	2.5
Current Ratio (%)	86.4	61.1	98.2	67.8
Quick Asset Ratio (%)	21.7	9.7	34.0	18.8
Capital Ratio (%)	49.9	41.0	45.2	39.5

Source: Created from the PAJ Annual Report

2.5.2 Operation and maintenance

(1) NWC

For the Montego Bay Sewerage, the various facilities (sewage treatment facilities, drainage pipe lines, etc.) are largely being maintained and managed properly[48]. Immediately following the start of operations for the central treatment facility there were a great many complaints received from residents in the surrounding areas concerning the foul odor produced by the stabilization pond, but currently the situation has calmed down. However, as has already been indicated in the section on Effectiveness, as of now the concentrations of BOD and SS in treated wastewater hardly meet the standards for wastewater. The NWC believes that the "values for the concentrations of BOD and SS are high as a result of the impact from algae arising in the stabilization pond." There are no problems in particular regarding the operation and maintenance for the Lucea/Negril water supply facilities[49].

At the NWC's Western Division, the Customer Assistance Programme for the

[48] From the results of interview surveys with beneficiaries, 74% of the valid responses from households (45 out of 61 households) indicated that there are no problems with the facilities' maintenance conditions.

[49] From the results of interview surveys with beneficiaries, 84% of the valid responses from households (32 out of 38 households) indicated that there are no problems with the facilities' maintenance conditions.

sewerage system aimed at residents was initiated in 2003. In order to assist with such activities, the Western Division newly created the position of Wastewater Engineer and is developing various activities to improve the sewerage diffusion rate. The NWC lists major public schools and hospitals as the targets for this diffusion.

(2) NWA

In terms of the operation and maintenance conditions of the Northern Highway there are absolutely no problems with the paved sections. Concerning the sections where construction occurred, there is a bump at the section connecting bridges and roads as a result of the sinking of earth fill, which is disturbing the stable travel of vehicles.[50]

The drains for the Montego Bay Drainage and Flood Control (total length of approximately 1 km) are cleaned along their entire line several times per year. However, there is a rapid sedimentation rate for garbage in the catchment area on the drains uppermost part and the siltation pond in their intermediary part. There are some cases where this sedimentation causes dysfunction of drainage, according to surveys of the beneficiaries[51].

(3) PAJ

The operation and maintenance conditions for the piers, passenger cruise ship terminal facilities, and parking lots which were expanded through the Ocho Rios Port Expansion are extremely favorable. According to the PAJ no large-scale renovations have occurred from 1998 when the project was completed to the present[52].

3. Feedback

3.1 Lessons Learned

None in particular.

3.2 Recommendations

Recommendations for the executing agencies

[50] The NWA has determined that the bump at the connecting section of the bridge is a mistake on the part of the construction company, and is performing repair work pursuant to the warranty for defect liability (scheduled to be completed in 2006).

[51] The NWA views the problem as one of illegal dumping of garbage by residents in the regions surrounding the catchment area, claiming “We would like to conduct educational activities aimed at schools and so forth situated upriver from the drains.” However, in interview surveys with beneficiaries, residents in the surrounding regions point out the low frequency with which the NWA cleans the drains. Approximately 30% (12 out of 43 people) of the valid respondents say that “more maintenance is necessary.”

[52] Once in the past, dredging (scooping out sand and soil) was conducted within the port.

Recommendation 1 for the National Water Commission (NWC): Recommendation 1 regarding the Montego Bay Sewerage

A prompt response is desired from the NWC to address the problem of treated wastewater from the Montego Bay sewerage facilities not meeting the standards for wastewater. The NWC should institute detailed surveys performed by experts which include clarifications of the main reasons for this problem, such as the extent of the "impact from algae." It should also formulate countermeasures and put them into practice immediately.

Recommendation 2 for the National Water Commission (NWC): Recommendation 2 regarding the Montego Bay Sewerage

When promoting the Customer Assistance Programme for the sewerage system which the NWC's Western Division has been advancing since 2003, it is essential for the NWC to coordinate it with countermeasures for non-revenue water (new installation and replacement of meters and community educational activities). It is also necessary to promote community educational activities, which include thorough familiarization with the rates structure in particular (the NWC implements the "assumption system" for wastewater rates whereby the NWC assumes that 100% of the supplied water quantity used will become wastewater, and then charges for the same amount).

Recommendation 3 for the National Water Commission (NWC): Recommendation 3 regarding the Lucea/Negril Water Supply

The NWC is currently implementing the North Western Parishes Water Supply Project which is aimed at the regions in the northwestern part of Jamaica, including Hanover Parish and Westmoreland Parish. This project includes activities such as installing a total of 23,000 water meters and revisions to their customer management database. It is expected that the project will contribute to reducing the non-revenue water rate in the northwestern part of Jamaica. Such activities are part of efforts aimed at improving the non-revenue water rate from among the Three Year Action Plan (2004-2006), which is the NWC's administrative improvement program. The NWC should put forth the utmost effort toward steadfastly implementing these efforts and producing results.

Recommendations for the National Works Agency (NWA)

Only five years have passed since the establishment of the NWA, and the agency's financial foundation is extremely weak. Due to this, the agency should

quickly implement an administrative improvement program which is tailored to the organization's special characteristics. Specifically, the obligation to allocate a portion of its income from fees to the national treasury and restrictions on the use of income from fees should be reexamined, and the agency's financial independence should be facilitated. Moreover, regarding its financial foundation, in order to coordinate with the National Road Services Improvement Programme which is currently being implemented through the assistance of the Inter-American Development Bank (IDB)[53], the NWA should aim to lower costs for road operation and maintenance operations.

[53] This project include activities such as introducing efficient contract methods for road operation and maintenance operations, mainly for the utilization of the private sector (refer to Footnote 41), as well as using financial sources like an acquisition tax for drivers licenses to ensure sources of funds for road operation and maintenance.

Comparison of Original and Actual Scope

Item	Plan	Actual
(1) Output 1. Montego Bay Sewerage	Construction of drainage pipes: 7.9km in total Construction of pump facilities: 2 Central treatment facility:[54] 7.2 imgd Construction of a sludge treatment facility (to be constructed within the central treatment facility)	33.6km in total 5 10.0 imgd Cancelled, changed to a stabilization pond
2) Lucea/Negril Water Supply	Construction of a water purification facility: 5.0 imgd Construction of water distribution facility: 21.2km in total	7.5 imgd 27.1km in total
3) Northern Highway Improvement	Improvement of the highway between Negril and Montego Bay: total extension of 73.3km	Total extension of 71.2km
4) Montego Bay Drainage and Flood Control	Construction of drainage channels, drains, and settling tanks, etc.: total extension of 1,127m	Total extension of 1,073m
5) Ocho Rios Port Expansion	Enlargement of second berth: 180 feet (about 55m) (to allow large-scale passenger ships of up to 900 feet (about 275m) to make berth through enlarging the second berth)	As planned (Large-scale passenger ships of up to 1,020 feet (about 311m) in size are able to make berth)
(2) Construction Period	Planned Period for the 5 Projects Overall: November 1991-October 1996 (59 months) Planned Period by Project: 1) Montego Bay Sewerage: November 1991-October 1996 2)Lucea-Negril Water Supply: November 1991-July 1996 3) Northern Highway	Actual Period for the 5 Projects Overall: November 1991-September 2002 (130 months) Actual Period by Project: 1) November 1991-January 1999 2) November 1991-June 2001

[54] The treatment method of the water treatment facilities is the lagoon system by means of settling ponds (a sewage treatment system which utilizes the natural environment).

	Improvement: November 1991-October 1996 4) Montego Bay Drainage and Flood Control: November 1991-May 1996 5) Ocho Rios Port Expansion: November 1991-August 1995	3) November 1991-September 2002 4) November 1991-October 2001 5) November 1991- January 1998
(3) Project Cost		
Foreign Currency	4,881 million yen	11,600 million yen
Local Currency	6,593 million yen (393 million Jamaica dollars)	15,746 million yen (5,611 million Jamaica dollars)
Total	11,474 million yen	27,346 million yen
ODA Loan Portion	8,606 million yen	8,599 million yen
Exchange Rate	1 Jamaica dollar ＝ 16.8 yen (October 1991)	1 Jamaica dollar ＝ 2.8 yen (average from October 1991 – September 2002)