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Evaluation of the Jamaica Urban
Environmental Program for On-Site Sanitation

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by
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and
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Janelle Daane, an environmental, civil, and construction engineer, has over 14 years' experience developing water supply and sanitation services, primarily for indigenous people. She has worked extensively in the former Soviet Union where she helped lead U.S. assistance programs to address environmental damage to the Aral Sea, water supply needs for repatriating ethnic groups in Crimea, and water utility reform in Ukraine. Dr. Daane is versed in disaster assistance work and provision of low-cost water and wastewater services in Africa and the Middle East. As a field engineer, she worked in native Alaskan villages to provide rural water and wastewater services for the U.S. Public Health Service. Currently, she manages international disaster assistance, engineering, and demand-driven pollution reduction contracts for Camp, Dresser & McKee International.

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ACRONYMS

CO	Community Officer (staff of SSU)
CRDC	Construction Resource and Development Centre
CHFC	Caribbean Housing Finance Corporation
EA	environmental assessment
EHP	Environmental Health Project
GOJ	Government of Jamaica
HG	Housing Guaranty loan program
KCP	key community people
MEH	Ministry of Environment and Housing
MGD	million gallons per day
MIS	management information system
MOH	Ministry of Health
NEST	National Environmental Societies Trust
NGO	nongovernmental organization
NRCA	National Resources Conservation Authority
NWC	National Water Commission
PHI	Public Health Inspector
RHUDO	Regional Housing and Urban Development Office
SSU	Sanitation Support Unit
UNDP	United Nations Development Program
USAID	United States Agency for International Development
VIDP	ventilated, improved double-pit latrine

WS&S water supply and sanitation

EXCHANGE RATE

At the time of this evaluation, the exchange rate was J$35.00=US$1.00

EXECUTIVE SUMMARY

Background

The Government of Jamaica, assisted by funding from the USAID HG-012 (Housing Guaranty) loan, initiated a program in 1995 to upgrade house lots in portions of two peri-urban communities in Montego Bay, Jamaica. The program included (1) bringing piped water adjacent to individual lots; (2) completing a revised land survey; (3) providing roads, storm drainage, and electricity; and (4) facilitating the acquisition by plot holders of clear title to individual lots. To address the issue of wastewater disposal once the squatter areas were provided with water service, USAID/Jamaica approved a proposal from the Jamaican NGO, Construction Resource and Development Centre (CRDC), to assist in the implementation of the sanitation program.

In July 1995, CRDC organized a branch office, which it called the Sanitation Support Unit (SSU), to carry out the sanitation program in Montego Bay. The goals of the sanitation program were (1) to assist residents in installing safe, on-site sanitary facilities as part of a larger, overall program to gain land title, and (2) to improve the health status of residents by reducing poor hygiene behaviors and providing access to improved sanitation infrastructure.

The SSU assisted residents in reaching these goals through four main activities. The SSU**C**

- developed and carried out community education, and behavior change and social development programs
- arranged for sanitation loan agreements between plot holders and the Jamaican organization, Caribbean Housing Finance Corporation (CHFC)
- assisted the lot holders with technology selection and arrangements for installation
- helped ensure that sanitary facilities are built to meet requirements of the Public Health Inspectors of the Jamaican Ministry of Health.

Key components of the CRDC/SSU program methodology are as follows:

- to engage the community members in discussions and decisions about their environmental problems and solutions
- to stimulate demand for sanitation
- to provide a menu of technical choices for the sanitary solutions
- to facilitate loans from the Caribbean Housing Finance Corporations for building new sanitary facilities or upgrading existing facilities
- to facilitate construction of the sanitary facilities by private-sector contractors
- to promote healthy hygiene behaviors
- to facilitate inspection of sanitary facilities by Public Health Inspectors

In May 1997, the Environmental Health Project (EHP) was asked to carry out a final project evaluation of the Jamaica Urban Environmental Sanitation Program for On-Site Sanitation. Specific tasks were to evaluate the performance of the SSU and the impact of program activities on target populations. The evaluation methodology included reviewing existing written information and collected data, interviewing staff and other institutional stakeholders, and physically inspecting sites and interviewing community members. This

report presents the evaluation results and provides overall conclusions and recommendations.

Results

The evaluation team found that CRDC/SSU developed an effective technical strategy which, in combination with the behavior change strategy, resulted in significantly increased sanitary coverage and improved urban environmental conditions. The key components of this strategy were developing technologies that were appropriate for the conditions on the site as well as acceptable to individual lot holders, effectively using private-sector contractors to do the construction, and providing affordable solutions. Key results were as follows:

- A significant number of families are using improved sanitation facilities. It is estimated that by the end of the project, 620 families will be using new or improved sanitary facilities.
- The project has reduced the flow or seepage of untreated wastewater into Montego Bay through sinkholes by an estimated 3,420 gallons per day. ANew@ untreated wastewater is also being prevented from entering the Bay; approximately 14,820 gallons of sewage per day are currently being disposed of in an environmentally acceptable manner.

The evaluation team found that a key element contributing to CRDC/SSU=s effectiveness has been the development of a behavioral change program that complements the technical strategy. The behavior change program actively involved the community in decision-making regarding improved sanitation and has facilitated behavior changes which have enhanced health status. The focus of CRDC/SSU=s behavior change strategy consisted of three critical elements:

- monitoring to track behavioral change
- social mobilization of community members
- involving women as active participants

Key results are summarized in this report. A brief description is given below.

- The SSU=s behavior monitoring and information (M&I) system has been a major strength of the program and provides feedback to program interventions. The CRDC/SSU was able to review activities and improvements in implementation. The M&I system also functioned as a behavior monitoring tool, enabling the program to determine what changes in personal behavior were being made as the interventions proceeded.

  Ten indicators reflecting program activities provided critical information on progress made in environmental conditions and health behaviors. The major finding from comparison of baseline and monitoring results is one of substantial improvement in hygiene behaviors. The project efforts resulted in significant improvement in two of the behaviors considered most effective in preventing diarrheal diseases: handwashing and protection of drinking water. In addition, behaviors were significantly changed not only by the presence of acceptable latrines, but also in usage of latrines by all family members over 5 years of age (a more valuable measure of hygiene).
- With training in participatory methods, the program made effective use of carefully selected individuals to sensitize others in their

community to environmental conditions and to facilitate their ability to make informed choices regarding sanitation and healthy behaviors.

- Women have played an active role in the SSU program as opinion leaders and promoters of positive health behaviors. A key success of the program was to provide women (and men) with the opportunity to secure loans to finance sanitary improvements which reduce environmental pollution and promote healthy living in their households and neighborhoods. A considerable number of families assisted are headed by women. In Rose Heights and Norwood, of the 1,839 households assisted as of April 30, 1997, 648 (35%) were headed by females, 926 (50%) were headed by males, and 265 (14%) were headed by both males and females.

CRDC/SSU has been successful in establishing a new institution with an effective organizational structure and strong management and leadership, well trained and motivated staff, and a sound financial foundation for sustaining operations after the USAID funding is ended. Key institutional results are the following:

- A financially sound fee system for all services provided by CRDC/SSU to the households has been established and is operational. CRDC/SSU charges up to J$4,500 (US$128.57) per household served.
- A cash reserve fund was established for CRDC/SSU=s continued operation when the USAID funding period is completed. To date, fees amounting to J$3,388,204 (US$96,805) have been deposited, with an end-of-project projection of J$7,500,000 (US$24,285).
- CRDC/SSU is approaching financial self-sufficiency in terms of its operating costs. With six months left in the project, CRDC/SSU is providing services to a sufficient number of households per month and has reduced it operating costs to the point where fees now represent 86% of its operating costs. Based on future projections, it is reasonable to assume that CRDC/SSU will be operating at 100% financial self-sufficiency by the end of the project.

Key Conclusions

Conclusions can be drawn from the monitoring and evaluation of the sanitation program. Key conclusions are summarized below:

- The project has been highly successful in meeting its performance targets. Nearly all nine of the performance targets established in the Cooperative Agreement between CRDC and USAID have already been or will have been met or surpassed by the end-of-project date.
- The program has improved the hygiene behaviors of a large proportion of the households in the intervention areas. The difference in key hygiene behaviors between the baseline and monitoring measurements are significant.

- The sanitation solutions provided by CRDC/SSU are affordable to the target community, have achieved wide acceptance, and are technically and environmentally sound. Approximately, 520 families are currently using new sanitary solutions as a result of this project.
- The project has reduced the amount of sewage effluent discharged into Montego Bay and will prevent significant amounts of sewage from entering the Bay in the future.
- The CRDC=s SSU office in Montego

Bay has become financially self-sufficient and institutionally sustainable. The Urban Sanitation Program model could be replicated by CRDC in similar peri-urban areas throughout Jamaica if credit were to be made available to households for the construction of sanitary solutions.

The program has demonstrated an effective model for providing basic urban environmental services to families living in poor peri-urban areas of Jamaica.

Key Recommendations

Based on the key conclusions and the evaluation team=s findings, several recommendations are put forward. Because the project was recently extended six months (to December 1997), there should be sufficient time to implement many of the recommendations.

CRDC and CRDC/SSU senior management should spend significant effort over the next six months documenting the results of the program and disseminating the urban sanitation model and lessons learned to Government of Jamaica (GOJ) policymakers, NGOs, external bilateral and multilateral agencies, and other sector professionals.

CRDC/SSU should develop an urban sanitation program Ahandbook@ to promote and replicate the program in other areas of Jamaica. The Ahandbook@ could include program Atools@ such as drawings demonstrating the types of technology used, construction costs, copies of contracts between local builders and residents, copies of loan agreements with households, copies of data collection instruments for the monitoring and improvement system, copies of reporting formats, and the like.

USAID should work with CRDC to identify new sources of credit to finance the construction of sanitation solutions for peri-urban households in Montego Bay and other parts of Jamaica.

Critical Success Factors

The CRDC/SSU program has proven to be an effective model for helping families living in urban informal areas to improve their environmental sanitation. Efforts to replicate this program should take into consideration the critical factors that led to CRDC/SSU=s success. These include:

Effectively involving the community in decision-making. The CRDC/SSU staff provided technical advice and facilitated decision making by community members. Respect for local priorities has been key to the development of good relationships with the community.

Effective demand creation. Through the efforts of the Community Officers, a climate of change has been created, not only through increased knowledge and motivation the part of individuals, but also by changing social norms wherein the community as a whole supports actions to improve sanitation and hygiene behaviors.

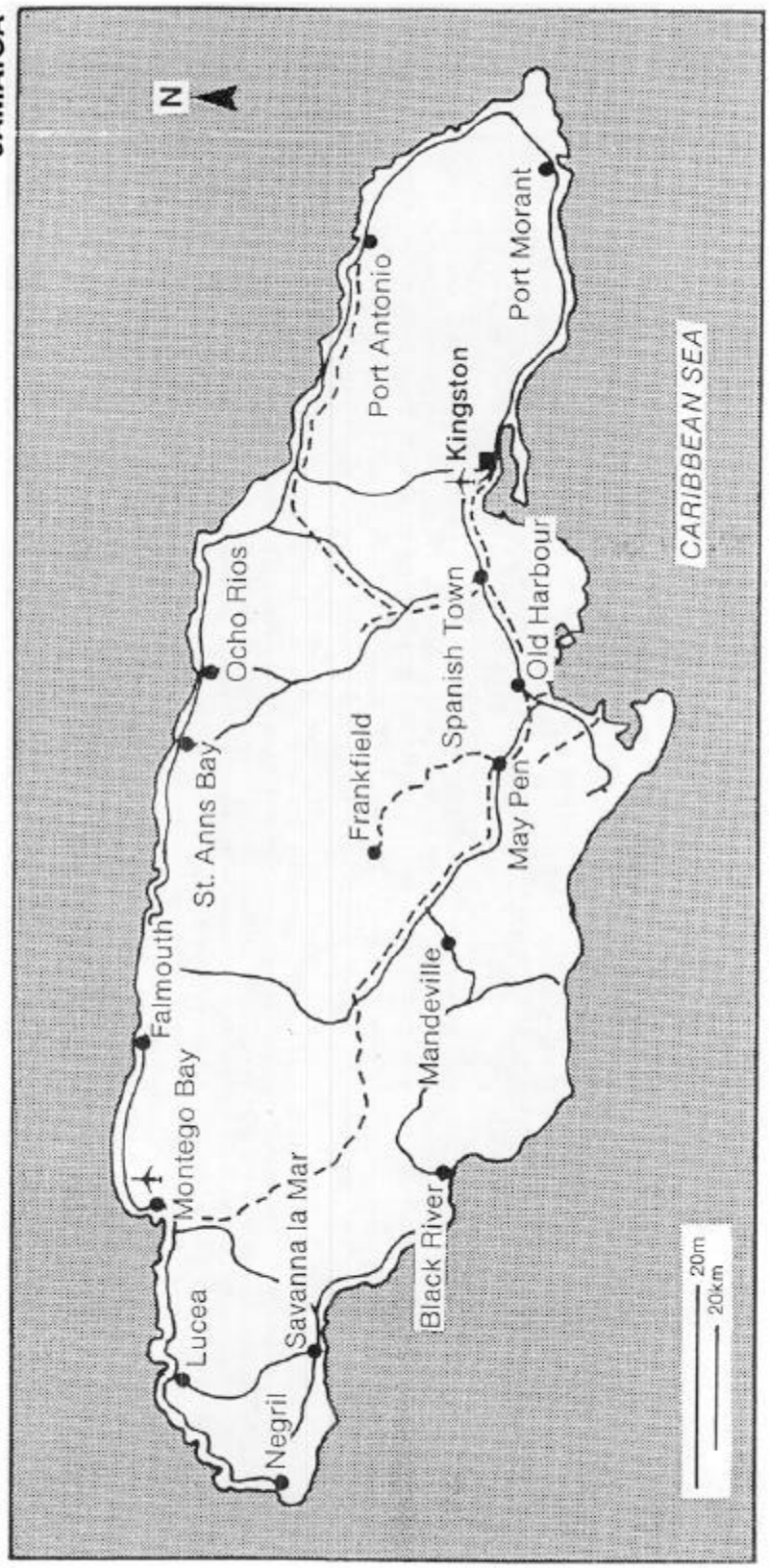
Effective multidisciplinary teamwork. The Community Officers and Technical Officers of CRDC/SSU have shared the same objectives; they communicated effectively with each other and clearly understood their respective roles to support improved sanitation and hygiene behaviors. The successful teamwork has also included community animators, contractors, Public Health Inspectors (PHIs), and engineering consultants.

Effective monitoring and improving.

Monitoring of project implementation began early in the project cycle. Over the life of the project, many adjustments and improvements were made in how CRDC/SSU implemented its program. Change, based on sound analysis of the problems, has been readily embraced and implemented once a decision was reached.

- *Integrating hardware and software approaches*. The CRDC/SSU provides an appropriate balance of hardware and software support. Demand is created; specific technical solutions are chosen by the lot owner; and training is provided for contractors to ensure that the lot owner receives a quality solution. This balance is embodied in SSU=s staffing pattern where there are an equal number of Community Officers and Technical Officers, who have equal status within the organization.
- *Providing access to capital financing for hardware*. The loans that were made available through CHFC were a necessary ingredient in allowing the plotholders to build their sanitary solutions. The terms of the loansCeven more than the actual cost of the hardwareCmade the chosen sanitary solutions affordable.
- *Charging fees for services rendered.* The plotholders paid fees for the services provided by CRDC/SSU. Typical fees of J$4,500 represented 7.5% of the total J$60,000 for the sanitary solution. The fees have allowed CRDC/SSU to become financially self-sufficient and have cast the relationship of plotholders to SSU as Aclients@ rather than Abeneficiaries.@
- *CRDC/SSU serving as facilitator rather than implementor*. CRDC/SSU did not build any sanitary solutions or provide any loans. Instead, CRDC/SSU served as an important bridge between formal governmental institutions such as the CHFC and the private-sector contractors, facilitating plotholders= access to important inputs that allowed them to improve their sanitary conditions.
- *Receiving effective and consistent technical assistance.* CRDC/SSU received periodic external technical assistance from international experts during the course of the project. An important feature was that the same experts returned to provide follow-on assistance.

In summary, the Jamaica Urban Environmental Program for On-Site Sanitation is an excellent example of how an NGO can play a significant role in implementation of a sanitation program. Local residents were provided with technical guidance, hygiene education, and a solution they wanted. As a result, improvements in the overall environmental health of the community have been realized. The project has resulted in at least 520 families (approximately 2,964 people) using appropriate sanitation facilities and a significant reduction in environmental pollution.



The map of Montego Bay is not available electronically.
Please contact EHP for a copy.

1 INTRODUCTION

In July 1995, USAID/RHUDO/Jamaica established a Cooperative Agreement with a Jamaican NGO, Construction Resource and Development Centre or CRDC, to implement and facilitate an urban environmental sanitation program in two informal urban settlements in Montego Bay. Using the grant agreement funds, CRDC organized a branch office in Montego Bay, called the Sanitation Support Unit (SSU), to carry out the project.

The sanitation project is being implemented in the Rose Heights and Norwood peri-urban areas of Montego Bay. The goals of the project are (1) to assist residents in installing safe, on-site sanitary facilities as part of a larger overall attempt to gain land title, and (2) to improve the health status of residents by reducing poor hygiene behaviors and providing access to improved sanitation infrastructure.

The SSU has set out to accomplish these goals through four main activities. The SSU (1) develops and carries out community education, behavior change, and social development programs, (2) arranges for sanitation loan agreements between plot holders and the Jamaican organization, Caribbean Housing Finance Corporation (CHFC), (3) assists the lot holders with technology selection and arrangements for installation, and (4) helps ensure that sanitary facilities are built to meet requirements of the Public Health Inspectors of the Jamaican Ministry of Health.

As part of the project start-up and implementation plan, USAID/RHUDO/ Jamaica provided a buy-in to the Environmental Health Project (EHP) to provide training and technical assistance to CRDC/SSU. The project has been assisted by EHP through an ongoing series of technical assistance interventions.

In May 1997, EHP was asked to carry out a final project evaluation. EHP's specific tasks were to evaluate the performance of the SSU and the impact of program activities on target populations. From June 2 to 13, 1997, EHP staff conducted the evaluation. This report documents the evaluation results and provides overall conclusions and recommendations.

Although changes in hygiene behavior cannot be stated as quantifiable improvement in health status of the intervention communities, a considerable body of research exists which clearly demonstrates the association between health behaviors and improved health status of a population. Because the project is not yet over, final figures on the number of residents served in the Norwood areas are not yet available. In addition, only a limited number of lots and residents could be visited by the evaluation team given the time frame of their assignment.

The report is divided into several sections. Background information on the Jamaica urban environmental situation, the nature of the informal settlements, the sanitation program, and EHP assistance will be described in Chapter 2. The evaluation methodology is discussed in Chapter 3. Evaluation findings are developed and analyzed in Chapters 4 and 5; they center on three areas– technical, institutional/financial, and community and health. Finally, key conclusions, recommendations, and critical success factors are presented in Chapter 6.

2 BACKGROUND

2.1 Environmental Strategic Objective of the USAID Mission to Jamaica

In 1994 when the Montego Bay urban environmental sanitation program was designed, the USAID Regional Housing and Urban Development Office (RHUDO) for the Caribbean was based in the office of USAID/Jamaica. In support of individual country USAID missions, the RHUDO office had the responsibility for managing Housing Guaranty (HG) funded urban environmental programs in Jamaica and other Caribbean countries. As a result of USAID's re-engineering efforts since that time, the RHUDO program in Jamaica has been integrated into the USAID/Jamaica environmental Strategic Objective 2, "increased protection of key natural resources in environmentally and economically significant areas." Although the urban environmental sanitation program was designed and initiated before the mission developed its Strategic Objectives, an important aspect of this project is that it supports and contributes to the related Strategic Objective performance indicator No. 2.0.2, "key tourism-based areas with improved coastal water quality." The related Intermediate Results and their Performance Indicators are shown in Table 2-1.

Table 2-1
USAID/Jamaica Intermediate Results and Performance Indicators for SO #2

Intermediate Results	Performance Indicators
2.1 Expanded areas of priority urban and natural resources under sustainable management.	2.1.3 Gallons of untreated wastewater from sewerage system entering Montego Bay
2.2 Increased financial resources for environmental management.	2.2.1 Local environmental enhancement activities operated on a cost recovery basis. 2.2.2 Revenue-generating programs and activities implemented by NGOs.
2.3 Strengthened capacity of Jamaican organizations to manage natural resources effectively.	2.3.1 Households and organizations successfully implementing environmental improvement activities

2.2 Jamaican Urban Environmental Situation

According to the 1997 Jamaica State of the Environment Report, increased urbanization has resulted in over half of the population now living in cities and town. Sixty-five percent of all Jamaicans live within 5 km of the coast, impacting the resources in the coastal strip. An estimated 104.3 million cubic meters per year of underground water have been abandoned as sources of water supply because of pollution or saline intrusion. An additional 241.2 million cubic meters per year have been affected, but continue to be supplied for restricted use only. Together these figures represent 10% of the exploitable underground water in the island. Water becomes polluted by sewage, saltwater, and leaching from dumps. Only 20% of households are connected to a sewerage treatment plant. The National Water Commission (NWC) continues to discharge approximately 25 million gallons of raw or partially treated sewage daily into the coastal and marine environment. According to a June 8, 1997, article in the *Gleaner* (a respected Jamaican newspaper), the NWC operates 51 sewerage treatment plants around the island, of which 6 were out of service at the time and 4 others were severely overloaded. The Montego Bay plant, for example, was designed to treat 1.5 million gallons per day (MGD) and is currently carrying more than twice that amount—3.5 MGD. The Montego Bay plant is currently out of service.

2.3 Jamaican Informal Settlements

In the period 1986 to 1990, Jamaica's population grew by an estimated 1% per annum. The 1991 census revealed that the population stood at 2,374,193. This growth has placed tremendous pressure on the island's supply of housing, and squatter settlements have proliferated. These have, more often than not, been developed in vulnerable areas without access to acceptable sewage disposal, garbage collection, and domestic water facilities. Improper sewage disposal facilities, in particular, pose a serious threat to vital water systems. Beaches and cays are the site of many recreational and leisure activities. Moreover, their despoliation has serious implications for the vitality of the island's tourist industry.

Norwood and Rose Heights are two squatter settlements situated on the outskirts of Montego Bay. These communities are situated on hilly and rocky terrain overlooking Montego Bay. Rose Heights is one of the largest squatter settlements in the area. The project sites include over 2,000 households, with an average of five to ten persons in each household. In the 1970s, people drifted to the area from tenement yards, in search of stability and a permanent roof for their families. Residents are drawn from a wide cross-section of Jamaica. There is a larger percentage of males to females and about 60% of the population are youths (under the age of 25). The residents started out by building "board" houses (from scrap lumber), but later built concrete block structures beginning with one or two rooms and expanding as time and money permitted (often taking as long as 20 years to complete). Rose Heights has two churches, a basic school, garages, tailors, dressmakers, and many small grocery stores. As in most squatter areas, basic water supply and sanitation infrastructure has been nonexistent, and poor hygiene and sanitation practices have presented a danger to good health. The infrastructure upgrading of the communities now in process is part of a GOJ land titling and upgrade program financed by USAID.

According to one of the CRDC/SSU Community Officers, "the members of the communities are warm, friendly, and kind; they are easy to get along with if you approach them in a decent manner."

2.4 The CRDC/SSU Urban Environmental Sanitation Program

2.4.1 History of Environmental Sanitation Concerns

The Government of Jamaica (GOJ), assisted by funding from the USAID HG-012 housing loan, initiated a program to upgrade lots in portions of two existing peri-urban communities in Montego Bay, Jamaica: sections A1, B, and C of Norwood community and the Rose Heights portion of the Rosemont community. The GOJ upgrading program is scheduled to be completed in late 1997 or early 1998. The upgrading projects in the communities include (1) bringing piped water adjacent to individual lots; (2) completing a revised land survey; (3) providing roads, storm drainage, and electricity; and (4) facilitating the acquisition by plot holders of clear title to individual lots. In 1994, an additional program was proposed which would enable the plot holders to install individual sanitation facilities on their plots to protect household and public health as well as the environment.

The implementation of appropriate sanitation solutions and the choice of applied technologies evolved through a series of steps. The following paragraphs describe how the choice of technologies was arrived at.

In September 1993 an environmental assessment (EA) of the Rose Heights and Norwood urban areas in Montego Bay was conducted. The EA supported the USAID housing loan which was to provide piped water to individual lots, roads, drainage, and electricity. After completing a revised land survey, the program also was designed to assist plot holders in acquiring title to their lots.

The EA indicated that wastewater disposal, which would result from improved water service, needed to be addressed. Disposal options were critically linked to geological conditions in the Rose Heights and Norwood areas, since many lot dwellers used sinkholes as a convenient method of removing excreta from the lot. (Sinkholes are passages or tubes in limestone which function as a direct conduit for transporting waste to the ocean.) The excreta waste load applied to sinkholes contributes to the degradation of the Montego Bay marine environment.

In May 1994, USAID/Jamaica commissioned a three-month activity to set design standards for sanitation systems and install pilot demonstration sanitation systems. In August of the same year, a report was prepared for USAID, indicating that a proper sanitation policy was not in place and that householders were resisting the idea of ventilated, improved double-pit latrines (VIDPs) as an option to dispose of excreta and wastewater.

In September 1994, USAID/Jamaica asked EHP to complete a viable wastewater design and implementation plan. To meet this request, a plot-by-plot inventory of existing sanitation facilities was conducted along with focus group interviews in the communities. The interviews indicated that there was great resistance to the VIDPs. They also found that community members strongly favored solutions that utilized a pour-flush technology, even if it required hauling water. Members of the EHP team conducted an inventory of existing sanitation solutions in the two target communities in November 1994. The inventory found that of the 1,556 lots surveyed, 41.5% had some form of water-borne sanitation (flush or pour-flush toilets) emptying into a variety of disposal methods (septic tank, absorption pit, sinkhole, gully, road drain); 39.5% used a latrine; and 19% of households were without any sanitation solution.

Based on the program design developed by EHP in partnership with USAID/Jamaica and the GOJ, USAID received and approved a proposal from the Jamaican NGO, Construction Resource and Development Centre (CRDC) to assist in the implementation of the on-site sanitation program. Funding was approved for an 18-month period, from July 1995 to December 1996. CRDC subsequently received a 12-month no-cost extension, to December 1997. The urban sanitation program was then implemented by CRDC in coordination with the larger USAID-funded squatter upgrading program implemented by the GOJ through the Ministry of Environment and Housing.

2.4.2 Original Project Design as per the Cooperative Agreement with USAID/Jamaica

The Cooperative Agreement between USAID/Jamaica and CRDC called for CRDC to facilitate the construction of sanitation systems for households in two peri-urban settlements. The sanitation program's aim was to improve the health of the population of each settlement without adversely impacting the environment. The expertise developed and methodologies employed by CRDC would be documented for use in similar settings in Jamaica and other parts of the world.

CRDC was to establish an office in Montego Bay in which the program personnel were to be based and from which the program was be operated. CRDC was to assist plot holders in selecting optimal waste disposal methods in terms of (1) cost, (2) existing on-plot disposal methods, (3) geological and topographical features of their plot, 4) plot holder preference, (5) health protection, and (6) environmental protection. CRDC was to collect materials and organize an information dissemination center to facilitate installation of appropriate waste disposal systems by residents of each community. The Cooperative Agreement with USAID also called for CRDC to establish a national and regional resource center on sanitation by creating a library of relevant work in circulation worldwide. CRDC would document operation of the program as well as all engineering information, scientific studies, and cost data and make such information available to interested parties.

The project design called for CRDC to develop curricula for and arrange training workshops in the design, construction, management, and maintenance of on-site wastewater systems for the following audiences:

- CRDC staff and the community in a variety of different areas;
- Public Health Inspectors of the Ministry of Health, Environmental Control Division; and
- Local artisans and unskilled workers in various technical skills required to install wastewater and graywater disposal facilities.

CDRC was also expected to develop social marketing tools for use in educational and behavior change programs for residents of the population of the two settlements.

CDRC was to provide residents of the communities technical assistance, cost estimates, and referral services to enable them to select a disposal system which fit with their wishes, was compatible with the subsurface conditions observed on the specific plot, and was affordable. CRDC was not responsible for the actual loan financing, however. As construction of an approved waste disposal system got underway, CRDC would carry out regular site inspections to assure the quality of construction. According to the Cooperative Agreement, CRDC was required to charge a fee to recover its costs and enable it to sustain operations when funding from USAID/Jamaica was completed.

Finally, in keeping with USAID/RHUDO focus in the Caribbean region on the urban poor and their coexistence with and impact on their environment, USAID/RHUDO planned to disseminate within the region lessons from relevant ongoing programs such as the Montego Bay urban sanitation program. In order to do this, a monitoring, evaluation, and dissemination program was required. Monitoring and evaluation would focus on social, environmental, health, gender, and technical issues. It was assumed that baseline data on socioeconomic status of the target communities would be available from the Community Development Office of the Ministry of Environment and Housing. Changes in social practices (such as acceptance, use, and management of sanitation solutions) and the level of women's participation in decision-making within households and communities would be measured against the baseline data.

2.5 Technical Assistance by EHP

In order to strengthen the capacity of CRDC to implement the urban environmental program for sanitation, USAID/Jamaica contracted with EHP to provide technical assistance in a range of areas. EHP's participation in this activity was consistent with USAID/G/PHN/HN/EH Strategic Objectives for EHP, "strengthening the capacity of local institutions to provide basic environmental health services to the urban poor."

The scope of work for EHP provided a framework for technical assistance to CRDC. As needed throughout the life of the program, EHP would provide technical assistance to CRDC in engineering, financial, health, and social science areas. Illustrative examples identified at the time included engineering technical assistance and training in on-site sanitation solutions and graywater disposal systems; assistance in developing a social marketing program to change environmental health-related behavior; and assistance with community-based urban environmental management approaches. EHP was also expected to provide technical assistance and training to CRDC in designing an effective monitoring and evaluation system.

3 EVALUATION METHODOLOGY

USAID/Jamaica called for a final evaluation to be conducted at the end of the sanitation project. The overall purpose was to evaluate the performance of CRDC in implementing the urban environmental program for on-site sanitation. To carry out the program CRDC had set up the Sanitation Support Unit (SSU) office in Montego Bay, the site of the intervention areas, Rose Heights and Norwood. Specifically, the evaluation team was to assess the performance of CRDC/SSU against indicators contained in the Cooperative Agreement (see Appendix A) and the original 18-month Work Plan (see Appendix B). The evaluation called for assessment of program organization, financial status, management, field work, significant outputs, and overall performance. Particular attention was to be paid to the prospects for sustainability of the program. EHP's Scope of Work for the evaluation is attached as Appendix C.

The evaluation team spent 11 days on site in Montego Bay, and one day in Kingston to present its preliminary findings and recommendations to USAID/Jamaica. The team reviewed consultants' reports describing technical assistance provided, studies carried out, program monitoring results, etc. (see Appendix D for the list of reports). In Montego Bay, CRDC/SSU financial documents, program records, information management forms and procedures, and social marketing materials produced by the program were reviewed and analyzed. On-site data-gathering was extensive and included personal interviews with the director of CRDC and all SSU staff members, residents of the two intervention communities, community animators and key informants, officers from the Ministry of Health and Ministry of Environment and Housing, bank officials, and construction contractors. A telephone interview was conducted with a local project-related engineering consultant. Field site visits were made to the intervention areas to inspect sanitary facilities and interview household members. (See Appendix E for a list of individuals contacted.) The team also attended a community meeting sponsored by CRDC/SSU and a meeting of community animators.

4 PERFORMANCE TARGETS AND SUSTAINABILITY OF CRDC/SSU

In this chapter, findings from the evaluation are presented and analyzed. The scope of work for EHP calls for a determination of whether CRDC/SSU met the performance indicators given in the Cooperative Agreement. Section 4.1 presents each of the performance targets and discusses CRDC/SSU's success in reaching them. Section 4.2 discusses how sustainable and replicable the CRDC/SSU program will be after USAID funding is completed.

4.1 Performance Targets

INDICATOR 1:

Financial self-sufficiency in regard to operating costs of the SSU at least 100% at end of project.

RESULTS:

With six months left in the project (at the time of the evaluation), SSU has reached a sufficient level of production in terms of households serviced and cost effectiveness in its operating costs to achieve 86% of its performance target of financial self-sufficiency. Based on projections, it is reasonable to assume that it will reach the 100% target by the end of the project (December 1997).

Discussion

Initial USAID funding has been key in the successful establishment by CRDC of the Sanitation Support Unit in Montego Bay as a strong community-based urban sanitation organization. From the start, it has been the goal of the creators of SSU that the organization become financially self-sustaining and move away from dependence on external financial support. CRDC has achieved that goal (a) by systematically analyzing the level of effort needed to achieve the desired environmental and health results and significantly reducing its operating costs from what was originally budgeted, and (b) by charging those households receiving its services a realistic fee, consistent with its actual costs. While achieving financial self-sufficiency in itself is an impressive result, it is particularly noteworthy that a Jamaican NGO is able to charge for its services, thereby transforming the target group from "beneficiaries" to "clients."

Based on reports provided by CRDC/SSU (see Appendix F, "CRDC/SSU Expenses by Month and Budget Line Item"), the historical average monthly operating cost is J$556,291/month. This average includes months in which the operating costs were very high due to one-time start-up costs, training, and the like. The monthly operational costs from January 1997 through April 1997 are better indicators of average operational cost levels. Based on the figures in Table 4-1, it is fair to say that CRDC/SSU has stabilized at average monthly operational costs of J$515,727.

Table 4-1
SSU Monthly Operating Costs
JanuaryBApril 1997
(J$)

Month	Salaries	Total Operational Costs
January	293,380	515,395
February	322,111	445,987
March	313,162	568,581
April	319,587	532,946
Total	1,248,240	2,062,909
Monthly average	312,060	515,727

Table 4-2
SSU Monthly Income from Service Fees
JanuaryBApril 1997
(J$)

Month	Fee Income
January	561,375
February	419,625
March	417,375
April	382,500
Monthly average	445,218

While all of the above costs are currently being funded by the USAID Cooperative Agreement grant funds, it is relevant to review income generated by CRDC/SSU through direct fees charged to the households for services rendered, as an indicator of the level of financial self-sufficiency achieved. CRDC/SSU's fee structure is as follows: CRDC/SSU receives J$1,125 for every household/plot that has an initial inspection by the Public Health Inspector. This fee is charged and paid to SSU whether the existing sanitation system is found acceptable or not acceptable. Lots/households deemed to have an unacceptable sanitary solution, who then go on to apply for a loan to build or improve their sanitary solution, subsequently pay CRDC/ SSU an additional fee of up to J$3,375. The total fee, therefore, for a household/lot that receives full services from CRDC/SSU is J$4,500. Table 4-2 shows SSU's monthly fee income from January to April 1997.

As shown in Table 4-2, CRDC/SSU's monthly income from fees averaged J$445,218 during the recent four-month period. This average represents 86% of the average monthly costs, J$515,727, during the same period.

While by itself, recovering 86% of costs is an impressive result—especially relative to traditional NGO experiences with limited financial self-sufficiency—it not unreasonable to project an even higher level of cost-recovery. The current monthly operational costs include the project director's salary which is based on comparable expatriate levels. When the funding from the USAID Cooperative Agreement ends in December 1997, it is expected that the current CRDC/SSU project director will be replaced by a Jamaican professional whose salary will be at a more usual level, by Jamaican NGO standards, i.e., lower than the salary of the current director. CRDC/SSU estimates that by replacing the expatriate director with a Jamaican director, the monthly operational costs will be approximately J$486,000. The current average monthly income of J$445,218 represents 92% of projected operating expenses starting in January 1998.

Another important factor in the financial self-sufficiency of CRDC/SSU is the operational efficiency of the unit in terms of the number of households serviced per month.

Information provided by CRDC/SSU suggests that in one form or another, an average of 85 households are currently serviced per month. The project director estimates that given the right conditions, SSU has the operational capacity to increase the number of households served to as many as 150 per month. This estimate is based on the operational efficiency and effectiveness of the staff, with development of systematic procedures for both the Technical and Community Officers and effective information management systems for the administrative team. The target of 150 households per month may be a bit ambitious and perhaps too optimistic, but it is reasonable to project that the number of households serviced by CRDC/SSU could be high enough to achieve the goal of 100% financial self-sufficiency from service fees.

INDICATOR 2:

A financially sound fee system for all services rendered by SSU established and operational at end of project.

RESULTS:

A financially sound fee system for services provided by CRDC/SSU has been established and is operational.

Discussion

A fee-for-services system was established and operational early in the project. As discussed above, SSU receives J$1,125 for all lots inspected by the Public Health Inspector (PHI). This fee is due whether the lot is found acceptable or unacceptable. Lot owners whose sanitary solutions are found to be unacceptable and who choose to apply for a loan from CHFC either to build an acceptable sanitary solution or to rehabilitate their existing system pay CRDC/SSU an additional fee of up to J$3,375. The fee is paid after the second PHI inspection finds the new/improved sanitary solution to be acceptable. The total fee paid to CRDC/SSU by lot owners who go through both inspections is J$4,500.

The fees to CRDC/SSU are paid from the loans that households receive to purchase their upgraded lot (as part of the larger GOJ/USAID HG loan project) and to build or improve their sanitary solutions. The typical loan to a household for the sanitary solution component of the upgrading program is J$60,000. Therefore, the typical CRDC/SSU fee of J$4,500 represents 7.5% of the total sanitation loan. The fee amount appears to have been negotiated by CRDC and CHFC based on an estimate of the CRDC/SSU costs for providing services. The basic assumptions used are (a) that CRDC/SSU costs are J$220/ hour and (b) that SSU spends an average of 7 person-hours per household before the first inspection and up to 15 person-hours during the process of working out an agree-ment with the plot holder for construction of a new or improved sanitary solution (up to the second inspection). All households that receive a sanitation loan sign an agreement that spells out the CRDC/SSU fees.

It is not clear how the figure J$220/person-hour of work by CRDC/SSU Community and Technical Officers was arrived at in the beginning of the project. It is interesting to note, however, that using the current monthly operating cost of J$515,000 and dividing it by the 13 employees results in an average hourly rate per person of J$225 (based on a 22-day month and an 8-hour workday). Thus, the fees charged by CRDC/SSU cover not only the direct hourly costs of the Technical and Community Officers but also the indirect costs of the management, administrative, and accounting personnel.

By contractually linking the CRDC/SSU fee payments to the sanitation loan from CHFC, the fees paid by households become mandatory. This has significant potential implications that will be discussed below regarding the sustainability and replicability of the program after the HG-financed upgrading program is completed. Nevertheless, discussions with CRDC/SSU staff suggest that, in general, plot holders believe that the amount

paid to SSU is commensurate with the value of services they receive. However, a better explanation by CRDC/SSU of its fee schedule in the beginning of the process might be helpful in reducing initial concerns by the plot holders.

Although the rate of J$220/person-hour appears to be realistic and financially appropriate, staff feel that they often put in more than the 20 hours per household allotted for services provided by both the Community and Technical Officers. While it was difficult to verify this assertion in the scope of the evaluation, as long as the total loan to households is fixed at J$60,000, charging for the additional hours worked would raise the percentage of the loan amount that is paid to CRDC/SSU beyond the current 7.5%. If the percentage were to rise, at some (unknown) point the households might no longer feel that they are getting their money's worth and that the CRDC/SSU service had become too expensive.

INDICATOR 3:

During the Cooperative Agreement period, all income received in regard to this SSU project is to be placed in an especially created Cash Reserve fund dedicated to SSU activities.

RESULTS:

A cash reserve fund has been created, and the CRDC/SSU fees have been deposited with Sigma Investment. As of June 1997, the balance was J$3,338,204, with a projected end-of-project balance of approximately J$7.5 million.

Discussion

As required by the Cooperative Agreement, early in the project, CRDC opened an account with Sigma Investment and subsequently deposited all earned fees into this account. The terms and conditions of the Cash Reserve account were previously approved by USAID/Jamaica, and quarterly financial reports are submitted to USAID/Jamaica. Rates of return on the Sigma Investment fund vary according to market conditions. The rate of return has ranged from 16% to 40%, depending on market conditions. According to the Project Status Reports submitted by CRDC to USAID/Jamaica for the period April 1 to 30, 1997, a total of J$3,706,875 has been earned in fees and deposited with the Sigma Investment Fund.

INDICATOR 4:

Existence of a functioning CRDC office in the Montego Bay area, including staff and equipment.

RESULTS:

A fully functioning CRDC office was created in Montego Bay. This office, called the Sanitation Support Unit of CRDC, is fully staffed, well managed, and has sufficient equipment (car, computers, phone, etc.) to implement the urban sanitation program effectively.

Discussion

During the design period of the urban sanitation project, CRDC was identified by USAID as an effective institution with relevant experience in various areas of Jamaica. Nevertheless, CRDC's capacity to implement the program was limited since it did not have an established office in Montego Bay nor did it have excess staff to second to implement the Cooperative Agreement. With financial support provided by USAID/Jamaica, CRDC proceeded to recruit and train a project director and other staff. CRDC was also able to acquire office space in Montego Bay from the Ministry of Environment and Housing and equipped it with the necessary office furniture, files, phones, and computers. The project also purchased a vehicle to support implementation activities.

Today, the CRDC/SSU office has a staff of 13 comprised of the project director, three Community Officers, three Technical Officers,

a three-person administrative and accounting team, and three additional support personnel. The program has a targeted mission statement, effective working norms and principles, realistic work plans, clear division of roles and responsibilities among its staff, and an effective and comprehensive management information system. The staff appear to be capable, motivated, and committed to the program. They also feel proud about the success that they have achieved to date.

An important indicator of institutional strength is the effective and comprehensive management information system (MIS) developed by CRDC/SSU. The MIS consists of a computerized data bank that collects information on progress in each of the project sites; the data is often disaggregated by households. Samples of the data forms and reports developed by CRDC/SSU are included in Appendix G. These reports track key performance indicators such as the number of sites inspected and whether the existing sanitation system was found to be acceptable or not acceptable, plot holders who have received a loan to build an improved sanitary solution, CRDC/SSU fees earned, and the like.

INDICATOR 5:

1,200 sanitation solutions approved by regulatory authorities as appropriate and adequate, of which at least 90% involve Housing Guaranty-eligible beneficiaries.

RESULTS:

Approximately 1,247 sanitation solutions have been approved by regulatory authorities to date. All solutions involve Housing Guaranty-eligible beneficiaries. Another 100 sanitation solutions are expected to be approved by regulatory authorities in the Norwood Section A1 area, currently under implementation. By the end of the project period, the number of sanitation solutions approved by regulatory authorities is expected to be 1,347.

Discussion

To date, a total of 1,890 sites have been evaluated in the Rose Heights and Norwood areas by SSU—1,391 of them in Rose Heights and 499 in Norwood. An additional 200 sites currently are being evaluated in the Norwood area.

A breakdown of the number of sanitation solutions approved by the PHI is shown in Table 4-3, where the difference in number between the initial inspection and the second inspection indicates the number of new absorption pits or other solutions provided.

Section A1 in Norwood is currently being addressed. About 200 lots will be evaluated; of these, approximately half are expected to be found acceptable.

The CRDC/SSU staff estimates that of the 300 households in Rose Heights with "not yet addressed" (or unacceptable) sanitation inspections, only 5% are the result of resistance on the part of the residents.

In Norwood, 342 solutions are still unacceptable or unaddressed, and only 26 sites have been provided with absorptions pits. This situation reflects the fact that construction on sanitation solutions is still underway in much of Sections B and C. In addition, because Norwood already has water service, many residents have established some method of managing wastewater and excreta disposal, even though the systems may not be environmentally appropriate. Another reason that some lots with unacceptable or no sanitary systems have been unaddressed is that CRDC/SSU staff have been unable to make contact with the residents. The evaluation team does not know the percentage of unaddressed households attributable to resistance on the part of residents because the program was just being implemented at the time of the team's visit.

Table 4-3

Results of Initial and Second Inspections in Rose Heights and Norwood (Sections B and C)

Rose Heights:

Initial PHI Inspection	2nd PHI Inspection
All Sections	
355 found acceptable	*736 + 355 now acceptable
1,036 unacceptable	300 not addressed
1,391 evaluated	1,391 total

*736 is the number of new sanitation solutions provided

Norwood:

Initial PHI Inspection		2nd PHI Inspection
Section B	**Section C**	**B & C**
125 found acceptable	5 found acceptable	*26 +125 +5 acceptable
211 unacceptable	157 unacceptable	342 unaddressed
336 evaluated	162 evaluated	498 total

*26 is the number of new sanitation solutions provided

While 736 new sites in Rose Heights have been found acceptable in terms of absorption pit construction, not all 736 sites are in use. The exact number of households actually using newly provided absorption pits is not known; however, estimates can be extrapolated from a 75-person sample taken in Rose Heights.

An August 1996 sample taken in Rose Heights indicated that 33 out of 75 newly constructed sanitary solutions still needed to put into use. A follow-up visit to the sample homes conducted four months later (December 1996) found that 29 of the 75 still needed to be put into use. A third visit to the sample homes six months later (June 1997) revealed that 23 of the 75 still needed to be put into use. This information is shown in Table 4-4.

Table 4-4
Sample of New Absorption Pits Not Fully in Use

Sample	No. still not in use	Date Monitored
75	33	August 1996
75	29	December 1996
75	23	June 1997

Thus, approximately 10 to 12 months after the installation of absorption pits, 23 of 75, or roughly 31% of installed sanitary solutions, still had not been put into use. In other words, the toilet, service pipe, and/or structure housing the toilet still needed to be installed or connected to the absorption pit.

Extrapolating the monitoring data from the 75-lot sample to the 736 newly approved sanitary solutions, one could reasonably assume that approximately 31% of the 736, or 228 lot holders still need to complete the toilet, service pipe, or toilet structure installation in order to put the solution into use.

From the monitoring data in Table 4-4, incremental progress is clearly being made on completing construction of the toilet, toilet structures, and piped connections to the absorption pits. Sample responses given by residents about why the toilet had not yet been hooked up are as follows:

- Materials had not been received for this phase of construction.
- Lack of money to pay for labor.
- No time to complete solution until holiday.
- Waiting for annual Christmas bonus.
- Slowly completing hook-up now; just not finished yet.

By extrapolation, 69% or 507 lots in Rose Heights and some percentage of the 26 lots in Norwood are already fully utilizing their new sanitary solutions.

INDICATOR 6:

Information dissemination center on appropriate excreta disposal systems established in Montego Bay and stocked with adequate educational and training materials.

RESULTS:

A library and information dissemination center has been established and is functioning as a valuable information resource for CRDC/SSU staff and a limited number of sanitation-sector professionals in Jamaica. There is room for improvement in terms of increasing the collection of relevant literature existing in the international WS&S community, development of technical materials relevant to the Montego Bay urban sanitation experience, and a more proactive effort to make Jamaican sanitation-sector professionals and policymakers aware of the information center's existence.

Discussion

A library and information dissemination center has been set up within the CRDC/SSU office in Montego Bay. The library is fairly modest, consisting of four bookshelves in a large open space which also serves as the office's reception area. The library collection is made up largely of materials produced by the WASH Project, EHP, and the World Bank/UNDP Water Supply and Sanitation Program. According to the CRDC/SSU project director, these materials are used by selected Jamaican professionals' primarily those working with environmental NGOs in the Montego Bay area and by U.S. Peace Corps volunteers.

The evaluation team reviewed the materials in the library and found that while they are appropriate and useful, many other useful documents, available from the international WS&S community, were not in the collection. Additional materials that would be useful include not only relevant documents from the WASH Project, EHP, and World Bank/UNDP collection, but also materials from other sector organizations such as UNICEF, the Intermediate Technology Development Group, the Sanitation Working Group of the Collaborative Council on WS&S, the International Reference Center, and others.

In addition, there is very little available in the information center documenting the CRDC/SSU experience and lessons learned both for the process employed as well as with the various sanitation technologies considered. Given the rich (and possibly unique within Jamaica) experience that CRDC/SSU has had in urban sanitation, it is important that additional materials be developed to disseminate information about it to a wider audience.

INDICATOR 7:

A minimum of three training workshops held with the Public Health Inspectors of the Ministry of Health, Environmental Control Division

RESULTS:

Only one official training workshop has taken place with the Public Health Inspectors. However, a number of high-level Public Health Inspectors from the regional level attended it. In addition, Public Health Inspectors have found various other avenues to interface with community members and the SSU staff.

Discussion

In September 1995, eight regional Public Health Inspectors attended a two-week training workshop. Since then, Public Health Inspectors have regularly attended many block meetings with community members. In fact, an important training session on sinkholes in Rose Heights was designed and conducted by a Public Health Inspector.

The lack of availability of PHIs has been a factor in not achieving the target of three workshops. Desmond Clarke, Chief Public Health Inspector for St. James Parish which includes Montego Bay, stated that his department simply lacks the manpower to fulfill all of its obligations, but he also provided assurance regarding his sincere support for the sanitation program.

INDICATOR 8:

A minimum of four training workshops held with local artisans and unskilled workers in technical skills to install appropriate excreta disposal systems as per the Work Program.

RESULTS:

Four training workshops have been conducted with local artisans and unskilled workers in technical skills: two were conducted for Rose Heights residents, one was conducted for Norwood citizens, and one was conducted for residents of both areas.

Discussion

The first workshop was conducted in October 1995 for skilled masons, plumbers, and carpenters in Rose Heights. The training program provided local contractors with the skills necessary to install appropriate excreta disposal systems, and to encourage their employment by community members who were attempting to complete sanitation solutions.

A second workshop was conducted in Rose Heights in April 1996. The workshop provided training for general laborers and unskilled laborers so they could perform as much construction labor on the sanitation units as possible, thereby minimizing their need to incur costs for contractors.

In December 1996, a workshop was conducted on percolation testing in the Norwood area. Because CRDC/SSU was just beginning its technical work in Norwood, the staff was concerned that dealing with new soil conditions might warrant more extensive percolation testing. Thus, they hosted a workshop with local contractors, Public Health Inspectors, Peace Corps volunteers, and an EHP engineer to establish percolation norms for absorption pits in the Norwood area and to provide training for those unfamiliar with the percolation testing process. The gathering also provided a forum to address emergency work required on several existing absorption pits that had been damaged during recent roadwork in the subdivision.

The most well-attended workshop was the one held in February 1997 under the direction of Neville Williams, Chief CRDC/SSU Technical Officer, and Stephen Hodges, CRDC Engineer and Executive Director. Drawing more than 40 participants from the Norwood and Rose Heights communities, the workshop focused on appropriate methods for management of

graywater, that is, water resulting from washing, cooking, bathing, and other functions not associated with excreta disposal.

INDICATOR 9:

Development and publication of social marketing tools for the education and behavior change of the target population.

RESULTS:

Although the project got off to a late start in developing marketing tools, CRDC/SSU has now developed a variety of print materials for educational, promotional, and behavioral change purposes. Most importantly, the materials are relevant and are appropriately targeted to project activities.

Discussion

As materials were developed they were given to Public Health Inspectors, health educators, community animators, and Peace Corps Health Office staff for review and feedback. No formal monitoring of the effect of the materials on the target audience took place. However, there is anecdotal evidence that community members accept the program messages contained in the materials. The social marketing materials (brochure, flier, information sheet, etc.) produced complement other communication channels utilized by the program.

Initially Community Officers developed their own individual sets of materials for use in their training of animators and in behavior change activities. They created hand-drawn pictures, cartoons, charts, and posters. Formal printed materials were developed later than anticipated due to time constraints of staff, problems in identifying an artist, and financial limitations. To date, CRDC/SSU has developed (a) materials for educational and behavior change activities and (b) some promotional and informational materials. Samples are contained in Appendix H.

A. *Materials to support educational and behavior change activities*

- CARE OF YOUR ABSORPTION PIT, a one-page flyer using cartoon characters, designed for easy use as an information aid (do's and dont's).
- THE COMMUNITY ANIMATORS HANDBOOK. This is in draft form (to be printed soon) and incorporates suggestions of the community animators. It includes useful material from the training sessions given by the CRDC/SSU Community Officers for community animators, plus information about goals and functions of the SSU. It is written in clear, simple language and contains many cartoons and pictures. CRDC/SSU plans to finalize the content, hire an artist to create illustrations, and have it printed by the end of July 1997. The final document will be in a loose-leaf binder so that additional material can be added as developed. The handbook will be used for future training and as a reference guide and educational tool for animators in their field work.
- The methods described for training animators in approaching the community, behavioral change, and communication are creative and appear culturally valid. The technical material is accurate and clearly presented. It would be useful to observe how animators use this manual and other CRDC/SSU materials in their community education work. If time permits, when the handbook is in a more complete form it should be further tested with animators and community members before being finalized.
- TIPS FOR HEALTHY LIVING. This is a simple, photocopied, eight-page pamphlet featuring information about insects, feces, garbage and graywater disposal, water storage, and handwashing. The illustrations help convey CRDC/SSU's main messages for behavioral change.

- CALENDAR. This is the product of a children's contest organized by CRDC/ SSU. It features three winning pictures from the contest on a bright green background above a calendar. Eye catching and charming, it focuses on ideas for keeping the community clean. The calendar serves both a behavioral change and promotional purpose; it is the most popular item developed by the SSU to date. Three thousand calendars were printed, most of which have already been distributed. The evaluation team saw calendars hanging prominently in the Type 5 clinic in Montego Bay. The one criticism of the design is that the captions in the drawings are too small to read. This problem could have been avoided by featuring just the one winning drawing, or by making the calendar larger.

B. *Promotional and informational materials*

- SANITATION SUPPORT UNIT QUESTIONS & ANSWERS. This is a useful 8½ x 11" flyer which explains the work and objectives of CRDC/SSU and promotes its activities.
- SSU LOGO. The logo is simple and uncluttered; it works in different sizes and settings and is related to key ideas of the project.
- SSU BUMPER STICKER. The project developed a bumper sticker featuring the SSU logo and slogan, "Working Together for a Healthier Environment," specifically for taxi drivers to place on their bumpers or dashboards. A few T-shirts bearing the SSU logo were given to community animators.

At this point, the greatest need is for promotional materials to market CRDC/SSU's capabilities to potential donors and other parties with potential interest. CRDC/SSU has hired a public relations consultant to develop a marketing plan and materials, including slides and commentary for promotional presentations. A briefing kit, containing several of the community flyers described above, is also available for distribution.

Communication is a process of continual development and improvement. Testing and improving materials is continuous. New communication messages and materials should be developed on an ongoing basis to meet current and future needs. The poster contest for children, for example, generated interest and resulted in an effective and popular product. It should be tried again in a follow-on project. Perhaps children's poetry or song contests might prove successful as well.

If there is a follow-on project, it would be advisable to develop a communications plan which utilizes interpersonal exchanges and a media mix such as audiovisual materials (e.g., a video demonstrating SSU activities in the community), print materials (posters, brochures), and perhaps the use of mass media (radio, TV, newspapers) to reach a larger audience, promote the project, and create demand for services. The project could employ professional services on a part-time basis to develop such a plan, determine the particular role each communication channel would play and how, in combination, they could be mutually supportive, and assist in designing materials and messages appropriate for target audiences. Such a broad view of communication does not preclude the use of hand-drawn illustrations by animators and staff, which can be effective tools during presentations and field-work activities. Most importantly, the communication component needs to be coordinated with other elements of any future project.

4.2 Institutional Sustainability and Program Replicability

The sustainability of the CRDC/SSU program after the end of the USAID Cooperative

Agreement period, as well as the replicability of the CRDC/SSU approach in other parts of Jamaica, is discussed in this section.

As mentioned in the Performance Indicators section above, CRDC/SSU has been successful in creating a financially viable organization, charging fees for its services commensurate with its costs. It appears reasonable to project that CRDC/SSU will have achieved financial self-sufficiency by the end of the project. Furthermore, based on projections of future billings before the end of the project, CRDC/SSU should end up with almost J$7,500,000 in its cash reserve fund (see Table 4-5).

Table 4-5 probably overestimates the projected total income from fees as not all plot holders with an unacceptable sanitary solution go on to borrow funds from CHFC to make improvements. Nevertheless, the evaluators feel that the projected figure of J$7,500,000 is reasonable, given the interest earnings that will accrue to the cash reserve fund.

Based on estimated monthly operational costs of approximately J$500,000 and the projected cash reserve of J$7,500,000, it appears that CRDC/SSU has sufficient funds to operate for 15 months after the project ends and the USAID Cooperative Agreement funds are depleted.

While the calculation above seems promising, a critical issue that could prove to be the Achilles heel for the sustainability of CRDC/SSU urban sanitation activities is the uncertainty regarding future availability of credit to households where a demand for improved sanitary solutions exists. A critical success factor for the urban sanitation program was the availability of credit to households from CHFC (with funds from the USAID HG-012 loan). By the end of this project (December 1997), an estimated J$90 million will have been loaned to the households to improve their sanitary solutions. As of the writing of this evaluation, CHFC does not intend to continue with the loan program for squatter areas after the USAID HG funds are depleted. Thus, a critical issue for the sustainability and replicability of the CRDC/SSU program is whether other financial institutions in Jamaica will be willing to provide access to credit to families living in informal urban areas similar to the Rose Height and Norwood areas. Even though there is enormous need and demand for sanitation in Montego Bay, Kingston, and other urban areas where CRDC/SSU or other NGOs work, very little can be done if credit is not available. CRDC/SSU has funds available to cover its operational costs from fees

Table 4-5
CRDC/SSU Income Projection by the End of Project

Site	Found Acceptable	Found Unacceptable	Fee (J$) per household	Total Projected Fees Earned (J$)
Rose Heights	355		1,125	399,375
Rose Heights		1,036	4,500	4,662,000
Norwood	230		1,125	258,750
Norwood		468	4,500	2,106,000
Total	585	1,504		7,426,125

earned to date, but would not be able to facilitate access to capital funds needed for construction of the sanitation hardware.

It is strongly recommended that USAID work with CRDC/SSU over the next six months to identify a source of credit for future sanitation capital costs.

A related point that should be mentioned here is that the loans from CHFC for sanitation improvements are part of a larger loan package to the households that includes the cost of road improvements, water hook-ups, electricity, and land titles. As of the date of this evaluation, the larger squatter upgrading project is not complete, and CHFC has not initiated loan recovery. The overall squatter upgrading (including the sanitation program) is scheduled to be completed by the end of 1997, and loan recovery should begin soon thereafter.

5 IMPACT OF PROGRAM ACTIVITIES ON TARGET POPULATION

Findings and recommendations on (1) technical and (2) community and behavior change strategies are described in this chapter. Activities already discussed under Performance Indicators in Chapter 4 will not be repeated here. Special emphasis in this section will be devoted to the effective utilization, sustainability, and replicability of the CRDC/ SSU's work and how it effectively improves the lives of plot holders while protecting the environment.

5.1 Effectiveness of Technical Component Strategies

CRDC/SSU developed an effective technical strategy which, in combination with the behavior change strategy, resulted in significantly increasing sanitary coverage and improving the urban environmental conditions. The key components of this strategy were developing a range of technologies that were appropriate to the conditions on each site as well as acceptable to community lot holders, effectively using private-sector contractors to do the construction, and providing affordable solutions.

This section will be divided into components on (1) sanitation solution implementation and process operation, (2) affordability, (3) environmental sustainability, (4) graywater management, and (5) system maintenance. Linkages of the sanitation program to other development efforts will be also be described. Finally, suggestions for improving the existing program and extending the CRDC/SSU experience to benefit future programs will be made.

5.1.1 Sanitation Solution Implementation and Process Operation

The implementation of appropriate sanitation solutions and the choice of applied technologies in the Montego Bay communities evolved through a series of steps. An EHP engineer reviewed and identified several possible sanitation approaches which met local regulatory approval. These technologies are documented in the report, *Manual of Guidelines for Selection and Design of On-site Wastewater Disposal Systems*. The technologies were discussed at a 1994 meeting at Old Harbour with senior government officials, including officials from the Ministry of Environment and Housing (MEH) and the Underground Water Authority. Local building codes do not address absorption pits, and while the Underground Water Authority and MEH considered the suggested on-site technologies less than ideal, they did agree that they were better than no services. Although several technologies were identified as possibilities for on-site waste disposal by the EHP engineer, the most reasonable choice (as well as the most popular among community members) was the absorption pit.

A program for on-site sanitation was developed which included bathrooms for each lot served. Bathrooms consisted of a toilet, a wash basin (sink), and a built-in bathing area. A drawing of the original design is shown in Appendix I. The CRDC/SSU arranged for all construction of the unit, including excavation and covering of the absorption pit, construction of the building to house the toilet, purchase of materials, delivery of

materials, work schedule for the contractor, and payments to vendors and the contractor.

Even though the CRDC/SSU staff were working intensively, progress was slow, and not many units were being completed. To improve the pace, USAID directed SSU to provide an excreta disposal solution which involved greater participation and responsibility on the part of the homeowner. Around April 1995, the project was divided into two phases. Under Phase I, the CRDC/ SSU Community Officers, Technical Officers, and the PHIs would work through a series of steps with lot holders to complete construction of absorption pits. This process is shown graphically in Appendix J. Under Phase II, the lot holder would make his/her own arrangements for labor to construct the bathroom, and CRDC/SSU support would include (1) a voucher payment for a limited amount of bathroom construction material, and (2) suggestions on what types of materials to buy.

Phase II was first implemented in May 1996. The new phased process was not only much more time efficient, but also included an in-kind commitment from the lot holder to construct an acceptable sanitary solution for excreta disposal.

During construction and implementation of Phase I and II, several adaptations by households, builders, and engineers occurred. One example is low-flush toilets. Residents in Rose Heights do not have on-site water. Therefore, they must haul water to use in pour flush toilets. Recognizing this, CRDC/SSU staff identified a Kingston vendor who stocked low-flush toilets, and then made provisions for these toilets to be delivered to local Montego Bay vendors.

SSU technical staff also made an adaption to absorption pit construction. With guidance from an EHP engineer, the CRDC/SSU staff determined that large crevices in absorption pits should be sealed in case they connected to sinkholes. Today, contractors call SSU Technical Officers for advice if they indirectly access a crevice which could lead to a sinkhole during excavation. If the contractor directly hits a sinkhole, a new excavation must be made on the householder's lot.

Soil percolation tests are performed by Technical Officers or contractors only when they are concerned that absorption pits will not absorb wastes at the appropriate rate; they are not done routinely at all sites. According to Technical Officers, there have only been a few cases when they believed absorption pits could not meet acceptable percolation rates due to extremely slow percolation. In these cases, the absorption pits became septic tanks (holding tanks) which will require periodic extraction of wastes by septic tank pumping equipment.

According to on-site contractors, Rose Heights residents seem to be more anxious to obtain new absorption pits than residents of Norwood. This may be because water is already being provided to residents in Norwood on an intermittent basis. Thus, Norwood residents may be less interested in a sanitary solution because they have already made some arrangement for excreta and wastewater disposal.

Absorption pits are sealed with concrete covers 8 feet in diameter. The quality of construction is as good as can be expected, since the use of formal cement mixers is cost-prohibitive, concrete curing rates are dependent on weather conditions, and design mixes are not being developed by skilled engineers. Each absorption pit has an 18" by 18" lid. The lids are tightly sealed to the absorption pit structure. While the tight seal will necessitate use of force to break the seal, and perhaps some chiseling, the tight seal does provide a degree of safety so that children do not have access to the 10-ft.-deep absorption pits.

Both Rose Heights and Norwood are located on very rocky, if not solid rock, terrain. The elevation of the areas is reported to be 400 to 500 feet above sea level. The groundwater level is the sea level. Some pits are rock to a depth of 10 feet. In these cases, contractors excavate to deeper depths to access permeable soils. Contractors and Technical Officers report that percable materials are often found at the 7 to 10 foot depth range. Lot holders are charged up to an additional J$10,000 for excavations deeper than 10 feet.

Although residents can make arrangements with the contractor to bury their service lines at cost, because most of the sites are rocky, many lot owners are running service lines on top of the ground from in-house toilets to absorption pits.

Technical Officers travel to construction sites every day to ensure that contractors—

- dig deep enough,
- do not make the bottom of the pit too narrow,
- measure the pit, and
- use adequate amounts of cement and reinforcement bar in their installations.

The Technical Officers encourage employment of those contractors who produce the best work. If the Technical Officers determine that a particular contractor's work is poor, they work with the contractor to improve performance. The Technical Officers also work directly with the lot residents to make sure that they are satisfied with the contractor's work and understand the overall installation process.

The PHI travels to the lot both before and after construction as shown in the flowchart in Appendix J. During the first trip the PHI inspects the lot to determine if a loan for a sanitary solution is required. If construction of a sanitary solution is required, the PHI returns after construction to approve the absorption pit. Once the pit is approved by the PHI, the second phase can begin.

While Phase I has been completed in the majority of lots, many recipients have only begun to initiate Phase II. One reason for this delay is that the PHI has not yet found time to inspect the lot. Although CRDC/SSU has used two other PHIs on a part-time basis in the past, currently it has access only to one part-time PHI, T. K. Allen. While Mr. Allen is extremely committed to the project and performs inspections, provides follow-up inspections, interacts with community members, and advises them on a number of public health concerns, he is available to work on the program only three days per week. Thus, residents cannot move into Phase II (obtain materials to complete their solution) because of the constraint on Mr. Allen's time and lack of inspection/verification that the absorption pit is correctly installed.

5.1.2 Affordability

In most cases J$60,000 is made available to finance construction of the absorption pit as part of a larger, overall property mortgage. This amount was determined from a 1994 bare-bones cost estimate for a simple, but complete, sanitary solution.

The typical cost of a contractor-installed absorption pit alone is J$40,000, leaving J$4,500 for the services of the SSU, roughly J$1,000 for variation contingency work, and J$14,500 for other ancillary items such as the toilet, wash basin, elbows, tees, piping, and other fittings. Thus, J$40,000 is available for Phase I, leaving J$14,500 for Phase II construction materials.

Under Phase II, CRDC/SSU arranges to pay selected vendors based on the lot holder's chioce of bathroom construction materials. Typical items selected include:

- toilet;
- face basin;
- PVC pipe and fittings;
- door;
- steel reinforcement bar;
- concrete block; and
- sand, cement, and stone.

In general, residents select one of three types of options in Phase II: (1) a superstructure built on top of the absorption pit, (2) a superstruc-ture affixed to the house, or (3) only fixtures. The average cost for materials for each option is shown in Table 5-1.

Table 5-1
Average Costs for Phase II Options

Option	Cost
Superstructure on top of absorption pit	J$29,000
Superstructure affixed to house (only 3 walls necessary)	J$27,000
Fixtures only	J$8,000

Because J$14,500 is the balance available from the property loan for Phase II materials, households needing a toilet structure (superstructure) on top of the pit (or affixed to the house) must pay an additional J$14,500 (or J$12,500) themselves. This amount, as well as the labor for Phase II and provision of a metal alloy (zinc) roof, becomes the lot holder's contribution to the project. As discussed under Performance Indicator 5, most lot holders are slowly but gradually completing their sanitary solutions. Thus, although no formal willing-ness-to-pay study was done, the current strategy of asking the householder to pay for Phase II labor and a portion of the material costs seems to be working; it is effective and affordable.

Several factors have contributed to making the project affordable. First of all, credit is available to households, allowing monthly payments over an extended period. Secondly, the technical solution put forth in this project is purposely a low-cost model.

Unfortunately, the cost of materials has increased over the past two years due to inflation, but the loan amount has not changed. Thus, lot holders purchasing Phase II materials last year could acquire slightly more materials than those in Phase II this year. Ideally, the sanitation loan would have been adjusted upward to compensate for the increased costs, thereby providing enough loan credit to pay for all of the Phase II materials, as originally designed.

Some residents take issue with paying the SSU for services. The Technical Officers are usually the staff members who bear the brunt of residents' concerns. After an initial meeting with the Community Officers, lot holders are aware that the absorption pit is estimated to cost approximately J$40,000, and that the balance of the loan can later be applied to the cost of materials for Phase II, construction of the toilet facility. Many community members first learn about the CRDC/SSU fee for service when the Technical Officers arrive and ask for their signature on the sanitation loan agreement. Only then do they become aware that CRDC/SSU is receiving a small payment for its service, and at that point, some residents voice concern over the amount, even though small.

5.1.3 Environmental Suitability of Sanitation Solutions

As noted in the response to Performance Indicator 5 above, at least 507 lots in Rose Heights and some percentage of the 26 lots in Norwood are already fully utilizing their new sanitary solutions. Estimating 5.7 people per household and that at least half of the Norwood residents have hooked up to toilets, the total number of people served and using new appropriate sanitary solutions under this project is currently 2,964. Assuming that 100 more households will be provided with and will use new sanitary solutions in Norwood (currently under construction), the number of people served and using new, appropriate solutions is expected to reach 3,534.

Finally, if householders gradually continue to complete installation of toilets and service line connections, and if all sanitary solutions being provided under this project are utilized, 4,913 people will be served with appropriate solutions, i.e., no longer dispose of waste improperly. This projection is shown in Table 5-2.

Table 5-2
Number of People with Completed Sanitation Solutions

Current number of residents using new sanitary solutions	2,964
Number of residents using new sanitary solutions when Norwood section is finished (expected)	3,534
Potential number of residents using new sanitary solution, if all residents with new facilities incrementally complete them	4,913

Assuming that each person contributes roughly 5 gallons of waste per day (5 gallons includes water necessary for pour-flush toilets), and that 2,964 residents are currently properly disposing of sewage in absorption pits, approximately 14,820 gallons per day are currently being disposed of in an environmentally acceptable manner.

Further, according to surveys conducted by CRDC/SSU, in the past approximately 144 households were disposing of waste through sinkholes. Under the program for on-site sanitation, these sites were provided with sanitary solutions. Today, SSU staff estimate that only 15 to 30 of these lots still remain connected to sinkholes. Thus, approximately 120 (144 minus 24) residences have been provided with appropriate sanitation solutions. Assuming 5.7 individuals per house lot, approximately 684 people are no longer disposing of sanitary waste via sinkholes. In fact, if these sinkhole users were previously utilizing pour-flush toilets, one could estimate that there has been a reduction of waste being applied to the marine environment through sinkholes of 3,420 gallons per day.

5.1.4 Graywater

The initial concept for on-site sanitation developed by USAID included bathrooms for each lot served. Bathrooms included a toilet, a wash basin (sink), and a built-in bathing area. Provisions for disposal of graywater from the shower were included. Because construction costs were too high to implement this type of sanitary facility, USAID focused on the highest health priority and made a decision to address excreta disposal only.

While the agreement between CHFC and CRDC/SSU does not mention graywater, SSU recognized graywater as a problem and has provided education programs on appropriate graywater disposal methods. Because Norwood has on-site water service, graywater has posed a bigger problem there than in Rose Heights. To promote better graywater management, CRDC/SSU is currently researching whether or not the sanitation loan can be expanded to address graywater disposal needs in the Norwood area. In addition, CRDC/SSU staff report that they are developing a brochure discussing appropriate graywater disposal methods.

Currently, almost all residents are disposing of graywater in "informal" systems, i.e., using various home-made systems to divert and drain water from their lots, most often into soak-away pits. In Norwood, graywater can be seen draining away from lots, pooling on roads, and eroding hillsides.

CRDC/SSU staff, Public Health Inspectors, and an engineer consultant employed by SSU provide guidance to lot holders on graywater management options and methodologies. Grease traps near the homes are recommended on graywater lines to reduce the amount of grease entering the soak-away pit.

Lot holders are surprisingly well versed in knowing not to dispose of greasy graywater in absorption pits. They are aware that graywater, especially from cooking, should be filtered to collect the grease before going to a soak-away pit.

5.1.5 Maintenance

According to PHIs and local engineers, an on-site waste disposal system utilizing an absorption pit would ideally include a septic tank connected to an absorption pit. The septic tank would capture excreta and grease, and only the sewage effluent would be conveyed to the pit for absorption through the soil. Given the typically limited lot space and limited ability to pay for septic tanks, project designers developed the current combined system in which excreta and effluent are both introduced into the absorption pit. Both the PHI and engineering consultant indicate that they are comfortable with this approach and believe that the pits will provide sufficient anaerobic digestion of fecal matter as well as adequate effluent drainage. They recommend that graywater and grease be disposed of in a separate greasetrap and soakpit arrangement.

Pit materials observed in at least two of the pits visited during the evaluation were extremely rocky, with the majority of the two pits being continuous rock. While the bottom regions of some rock pits may provide adequate absorption, some systems may not percolate as expected. If this occurs, lot holders will need to consult a septic tank pumping company to empty their pits periodically. The approximate cost for removing a 1,600-gallon load is J$ 3,500. (A completely full absorption pit would hold roughly 2,878 gallons.) Currently, there are no user guides or manuals discussing this maintenance procedure.

5.1.6 Linkages of the CRDC/SSU Program to Other Development Efforts

CRDC/SSU has linked its program to a number of development efforts by other groups. The SSU has worked closely with two local firms: the Montego Bay Marine Park and St. James Environment Watch. Both firms are interested in environmental solutions and environmental education in schools related to sinkholes and waste/garbage disposal. As a result, the two groups indirectly help to market CRDC/SSU.

The Ministry of Health also works closely with SSU. The MOH health education department staff review and give feedback to the SSU on its informational flyers and brochures. In fact, the MOH public education department uses the flyers and brochures in its own public education program. In addition, PHIs (employed by MOH) include their work with CRDC/SSU as results achieved in their periodic reports to senior MOH staff. The MOH Social Development Commission also has used data provided by CRDC/SSU in the establishment of community centers in Rose Heights.

SSU also networks with the National Environmental Societies Trust (NEST), an umbrella organization of environmental NGOs. SSU is listed in the NEST directory. NEST refers people to SSU to obtain information on various types of on-site waste management technologies and community participation development approaches.

CRDC/SSU is currently trying to expand into other housing development arenas and is attempting to identify other credit organizations in an effort to promote its work. Ms. Indeok Oak and Stephen Hodges will be giving a presentation to local UNDP staff, MOH, private sector organizations, and others on low-cost sanitation solutions this summer. In addition, Ms. Oak will be actively marketing CRDC/SSU over the next six months.

5.1.7 Recommendations

Although it may be more difficult for Community Officers to elicit lot holder interest in taking a loan for a sanitary solution, COs must let residents know from the start what the SSU fee for service will be. Providing the fee information at the beginning of the dialogue encourages trust and may make it easier for Technical Officers to interact and advise residents on a number of other technical matters.

Future projects should place more emphasis on percolation testing and perhaps sketching a soil profile of the pit. By determining the percolation rate and soil profile more accurately for each lot, two important things can be accomplished. First, the maintenance requirements for that particular absorption pit could be more accurately identified. That is, lot holders would have more information about the actual conditions of their pit, what the likely operation and maintenance requirements would be, and ultimately how the effectiveness of their disposal facilities is tied to the value of their land. Secondly, such information would provide important baseline information from which later operational comparisons could be made. Because the absorption pit method is not seen as an ideal solution to waste disposal, its effectiveness over time could be monitored, and this information could be used to help justify its use in other peri-urban areas.

As noted earlier, lot holders may need to hire a septic tank pumping company to empty their pit periodically. A brief O&M manual detailing how and when to have sludge pumped might be useful for lot holders. The manual could also include a section on how to use a dipstick to review the depth of sludge periodically to ascertain how well an absorption pit is functioning. The manual could also list potential sludge pumping services, phone numbers, and costs.

Graywater management is a significant problem in Norwood and is likely to become a large problem in Rose Heights in the near future when on-site water service is provided. Mr. Jeff Reid, an engineering consultant periodically employed by CRDC/SSU, is well versed in peri-urban graywater management. An artist should be employed to work with Mr. Reid to develop animated drawings showing graywater management methods and how to construct them. These drawings could be distributed among lot owners provided with water service under the USAID HG loan program. In addition, if funding were available to promote the technologies among other development agencies and groups (such an UNDP, NEST, St. James Environmental Watch, etc.), simple drawings should be developed for distribution. Finally, working with Mr. Reid, CRDC/SSU staff could consider researching the development of a smaller grease trap which could be made from alternative materials. In addition, Mr. Reid and staff could research the effectiveness of a prefabricated grease trap which could be promoted among various user groups across the island. Such a trap may already be on the market in other parts of the world. A one-page illustrated flyer could easily be developed showing how to maintain a grease trip, where it can be effectively placed (such as onto a P-trap under the sink), and its importance.

Just as drawings need to be developed for the graywater systems to promote their use, so too are they needed to promote use of the absorption pit technology. Again, to facilitate information sharing with other development agencies and groups (such an UNDP, NEST, St. James Environmental Watch, etc.), simple drawings should be developed for distribution. Further, when trying to communicate the need for sanitary solutions (and create demand) among lot holders, the use of simple drawings can help significantly to convey the technology approach and related improved health situation.

Because the CRDC/SSU has been so successful in carrying out a demand-driven sanitation assistance program in peri-urban areas, it should document its experience so that the

program can be replicated by others elsewhere. A "How To" manual could be constructed with emphasis on how a host-country team, with no governmental affiliation, can play a critical role in the implementation process. Sections on how to set the program up and lessons learned during implementation would be primary components of the manual.

5.2 Community Participation and Behavior Change Interventions

A key element contributing to CRDC/SSU effectiveness was development of a program to involve the community in making decisions regarding improved sanitation and to facilitate behavior change for improvement in health status.

The focus of the behavior change strategy consisted of three critical elements:

- social mobilization of community members
- involving women as active participants
- monitoring to track behavioral change

Following a discussion of these three main elements, results of the monitoring system are given by community section and by topic.

5.2.1 Social Mobilization of Community Members

The program recruited carefully selected community members and trained them in participatory methods to sensitize residents in their communities to environmental conditions. These community leaders facilitated residents in making informed choices regarding sanitation and healthy behaviors.

The CRDC/SSU behavioral change strategy entailed Community Officers (COs) working through community animators and key community persons (KCP) as well as making personal contact with residents. The COs, animators, and KCPs functioned as change agents to facilitate adoption of healthy environmental behaviors. Of the two targeted peri-urban squatter communities (Rose Heights and Norwood), Section B of Rose Heights was selected for the initial intervention and, in essence, served as a pilot project for CRDC/ SSU activities. Work in Rose Heights Sections C and A then followed.

Animators and KCPs are local residents identified by the COs when they initially approached the community. The following characteristics were sought: respected by the community, effective communicators, interested and enthusiastic about the CRDC/ SSU program and issues of hygiene/health/ environmental improvement, and well-informed about local affairs. The animators' role is to actively seek out individuals and groups and discuss sanitation and related issues with them. KCPs (or key informants) are primarily opinion leaders and influential role models who network with community members and give feedback or a "reality check" to CRDC/SSU staff. Some individuals are both animators and KCPs. In Sections B and C of Rose Heights, 35 animators and 12 KCPs were initially chosen. Of the 35 animators selected, only 10 were still active at the time of the evaluation. There are an additional 5 animators actively participating in Section A.

To date, there has been one training program for animators in Sections B and C which consisted of four training sessions, each lasting two to three hours, and a final session in which certificates were awarded. The training, which was developed by the COs, was participatory in approach and responsive to animators' stated needs. The content included communication and community development skills, environmental sanitation, and health issues. To date, animators in Section A of Rose Heights have received only informal training. CRDC/SSU has prepared a useful reference guide, *The Community Animator's Handbook*, which will be printed in late July 1997.

Social mobilization of community members has been achieved through the COs and animators who have targeted the general public, individuals, or specific groups such as women, children, men,

and taxi drivers for block meetings. Block meetings are educational sessions which encourage dialogue between community members and COs/animators. On average, block meetings are attended by 20 or 30 people, with a range of 10 to 70 people attending. CRDC/SSU has held block meetings with the following groups in Rose Heights:

Target Group	No. of mtgs
Women & children	5
Women	1
Men	2
General population	3
Taxi drivers & men	4
Sinkhole users	1

In Norwood, two meetings—one general and one for women and children—have been held, in addition to two meetings with KCPs and potential animators.

The COs also engage in individual meetings, spot sessions, and discussion sessions among interested and available gatherings in the community. The COs conduct about three spot sessions a day when they are in the field.

Several factors appeared to create demand for improved sanitation in the intervention areas. Residents of Rose Heights and Norwood believed that neighboring communities were disdainful of them because they were squatter settlements. At the time of the CRDC/SSU intervention, GOJ, assisted by funding from the USAID HG loan program, was making other infrastructure improvements in the communities, such as putting in roads and providing piped water and electricity. These amenities, plus the sanitary services offered by CRDC/SSU, gave residents reason to believe they could become formally recognized communities. Moreover, legal title to the land seemed more obtainable if the sanitation improvements were made. EHP consultant Jean Jackson, in her 1994 study in Norwood and Rose Heights (see Appendix D), described community concerns about the environmental pollution caused by indiscriminate excreta and garbage disposal, stagnant water, and flies. People were aware of the linkage between poor environmental practices and health but did not perceive themselves individually to be particularly at risk. In discussions with residents regarding preferences in types of sanitary solutions, considerations of status, convenience, and children's safety surfaced.

Although concomitant USAID/GOJ infrastructure improvements will probably not be a part of future CRDC/SSU interventions in other squatter sites, factors such as improved social status, children's safety, and convenience appeared to generate demand for improved sanitary facilities in Rose Heights and Norwood and should be considered in marketing efforts elsewhere. Concern about the health impact of existing sanitation practices was not instrumental in creating demand at the start of the program; the remarkable changes in health behaviors (which implied awareness and concern about health risks associated with harmful environmental practices) came after intensive health promotion activities were initiated in the intervention areas.

Recommendations

Clearly, the attrition rate for animators is a cause for concern with regard to the sustainability of behavioral change interventions. The following elements were seen by CRDC/SSU as motivating factors for community animators to continue actively in their role:

- Seeing results in the community
- Recognition by the community and by others
- Periodic meetings to reinforce and support them in their work

CRDC/SSU should persist in its efforts to motivate community animators and KCPs to continue their interest and involvement in behavior change activities. The following activities are recommended:

a. CRDC/SSU staff should continue meeting with the community animators and KCPs on a regular basis, even after the contractual, installation work in the community is completed. Currently, CRDC/SSU staff meet quarterly with animators in Rose Heights. Community Officers should continue to focus their efforts on working through community animators and leaders to achieve a multiplier effect in diffusion of program messages to sustain new behaviors.

b. CRDC/SSU awards certificates to animators at the completion of training and has provided some of them with T-shirts. Activities such as provision of T-shirts and caps bearing the SSU logo for all animators, plus producing a video of animators at work in the community areas, are recommended.

c. CRDC/SSU should explore with the Ministry of Health the possibility of creating paid outreach posts for a few gifted and highly motivated animators.

d. Increased efforts should be made to link animators to community organizations such as women's groups, institutions (churches and schools), and citizen associations to provide organizational support and reinforcement of sanitation improvements and their benefits.

5.2.2 Involving Women as Active Partners

Women have been both agents and beneficiaries of the sanitation program. A major program goal was to facilitate the application for legal title by assisting residents in gaining access to credit in order to install safe on-site sanitary facilities. In Jamaica, as in many other countries, women are hampered in their ability to obtain credit from financial institutions. Banks often require collateral that women do not have. Commercial financial institutions are more reluctant to lend to women and perceive women as risky borrowers, although a decade of research shows that women are less likely than men to default on loans.

A key success of the program was to provide women (and men) with the opportunity to secure loans. A considerable number of families assisted were headed by women. In Rose Heights and Norwood, as of April 30, 1997, 648 (35%) of the 1,839 households assisted were headed by females, 926 (50%) were headed by males, and 265 (14%) were headed by both males and females.

Giving women the opportunity to establish credit (and eventually land title) provides them with access to other resources. Although women in Norwood and Rose Heights work in a variety of jobs, such as in garment factories in the free zone, many conduct their own micro businesses in both the informal and formal sectors. With credit, women can increase their profits and income. Study after study shows that women spend a higher proportion of their earnings on food and health care for their children than do men. Thus, improving the income position of women heading households is likely to benefit the health status of other family members.

Women have played an active role in the CRDC/SSU program as opinion leaders and promoters of positive health behaviors. The program has given them a chance to make an important difference in their communities. They serve as role models and agents of change in their capacity as animators and KCPs. In fact, women make up more than half of these community volunteers, and their efforts are vital to the success and sustainability of the program.

5.2.3 Monitoring and Information System to Track Behavior Change

The CRDC/SSU's behavior monitoring and information (M&I) system is a major strength of the program and provides a feedback loop for program interventions. CRDC/SSU was able to review activities and use findings to improve

implementation. Importantly, the M&I system also functioned as a serial monitoring tool which enabled the program to determine what was happening as interventions proceeded and what behavior changes were taking place over time. Data were collected at the time of the Community Officers' initial interviews with householders and again 6 to 12 months later. Information was collected on the following topics:

- disposal of feces
- garbage disposal
- water storage and handling
- handwashing
- graywater disposal

To measure the variables, CRDC/SSU developed ten indicators, each with clearly defined parameters and training in observation or assessment.

Feces Disposal

1. Acceptable sanitary solution (PHI criteria) has been completed.
2. Acceptable sanitary solution (PHI criteria) is under construction.
3. Sanitary solution is used (by all family members over five years of age).
4. Sanitary solution is clean (criteria for "clean" were defined).

Graywater Disposal

5. Formal or informal system exists.

Garbage Disposal

6. No water receptacles seen in the yard (cans, bottles, tires, etc.).
7. No discarded plastic bags seen in yard.

Water Handling & Storage

8. All water storage containers are covered.
9. Water can be poured from drinking water container, or it has a tap.

Handwashing

10. Organized handwashing place exists (basin, water, soap).

To assess the sanitary solution (#1 and 2 above), data collectors (COs) have clear guidelines concerning what elements are required for sanitary solutions to be judged acceptable by the PHI. Information on all of the other indicators can usually be collected by observation, with the exception of #3, which requires questioning a household member. If it is established that the sanitary solution is used, it is recorded as used whether or not it meets PHI criteria of acceptability. Consistency of use is not included in the definition of use.

Baseline data was available from Rose Heights Sections C and A households. However, there were no baseline data from Section B, the site of the first intervention, due to problems with the data collection forms. Those early forms were subsequently revised and finalized. For the post-intervention surveys in Sections C and A, data were collected from random samples of 75 households in each section. The sampling frames for the two monitoring surveys consisted of all lot numbers in the two sections.

Although program monitoring was carried out in an efficient and timely fashion, there is concern regarding opportunity costs entailed by the Community Officers' spending a substantial amount of time in data collection, leaving less time for their behavioral change activities.

Recommendations

a. Revise and update the existing handbook, entitled *Monitoring and Improvement System for the SSU*, developed by an EHP consultant. (This document describes the M&I system and can serve as a resource for data collection and analysis by CRDC/SSU staff.)

b. Carry out end-of-project monitoring surveys in all intervention areas (i.e., Rose Heights Section B and Norwood).

5.2.4 Results of Behavior Change Monitoring

SURVEY FINDINGS FOR ROSE HEIGHTS, SECTION C

Baseline data was collected from households in 280 lots in Rose Heights, Section C in January and February 1996, and a follow-up monitoring survey was carried out six months later (August 1996) using a random sample of 75 households selected from the same population. Figure 1 compares the findings from the baseline and monitoring surveys for all ten indicators. There are striking differences between the baseline and monitoring surveys indicating remarkable improvements in all indicators with the exception of indicator 3. The third indicator, "Sanitary solution is used," was assessed for the best (by PHI standards) sanitary solution on the lot. Since there were many improved sanitary solutions under construction (and not yet in use) at the time of the monitoring survey, the indicator was lower in the monitoring survey than the baseline. This indicator is more meaningful, as shown in Figure 2, when combined with "acceptable sanitary solution," indicators 1 and 4.

Feces Disposal

The proportion of households with solutions currently considered acceptable increased from 28% at baseline to 54.7% at the time of the monitoring survey (see Figure 1). Similarly, the number of acceptable solutions under construction increased from none to 44% of households. Thus, about 99% of households had an acceptable sanitary solution either completed or under construction as of August 1996.

Figure 2 presents a summary of the "bottom line"—that is, solutions that meet the three criteria necessary for health benefits: 1) acceptable by PHI standards, 2) currently being used, and 3) clean (free of fecal contamination). Overall, 21% of households met all three of these criteria at baseline, and 52% met all three criteria at the time of the monitoring survey. The differences between baseline and monitoring surveys are highly statistically significant.

Graywater Disposal

The presence of graywater disposal systems (both formal and informal) at the time of the baseline and monitoring surveys were compared. Overall, the proportion of households with graywater disposal systems increased almost two-fold, from 47% to 89%.

Garbage Disposal

Both the proportion of households with no observable garbage that could hold water and the proportion of households with no discarded plastic bags lying about in the yard increased from about two-thirds at baseline to almost 100% at the time of the monitoring survey.

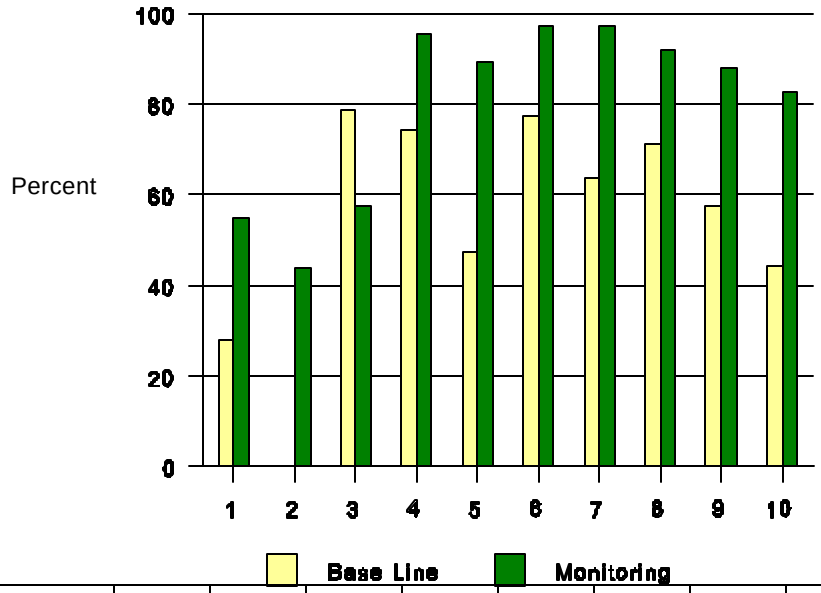
Water Handling and Storage

All water storage containers were covered in 92% of households at the time of the monitoring survey, compared to 71% at baseline. Similarly, the proportion of households with drinking water storage containers from which one can pour or which have a tap increased from about 58% at baseline to 88%.

Handwashing

The proportion of households with an organized handwashing place almost doubled from baseline (44%) to monitoring survey (83%). In both Sections C and A, of the three items necessary for "an organized handwashing place" (basin, water, and soap), soap was the item most frequently missing.

Figure 1
Comparison of Baseline and Monitoring Surveys of 10 Key Indicators, Rose Heights Section C



INDICATORS	1	2	3	4	5	6	7	8	9	10
Base Line	28.0	0.00	78.7	74.1	47.3	66.2	63.5	71.2	57.5	44.4
Monitoring	54.7	44.0	57.3	95.3	89.3	97.3	97.3	92.0	88.0	82.7

MONITORING INDICATORS:

FECES DISPOSAL
1. Acceptable sanitary solution (P.H.I. Criteria) completed
2. Acceptable sanitary solution (P.H.I. Criteria) under construction
3. USED
4. CLEAN

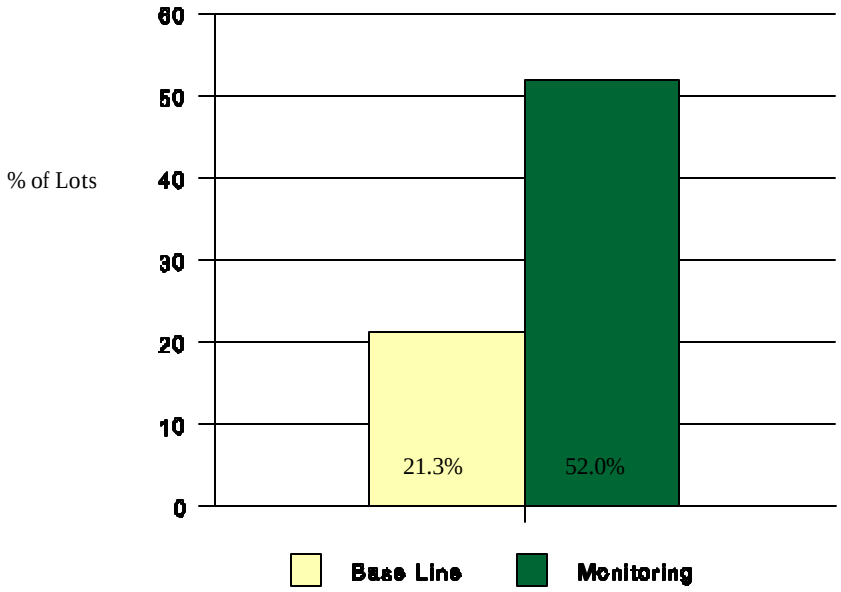
GREY WATER DISPOSAL
5. Formal or informal system exists

GARBAGE DISPOSAL
6. No water receptacles in the yard (cans, bottles, tires, etc.)
7. No discarded plastic bags in the yard

WATER HANDLING & STORAGE
8. All water storage containers are covered
9. Can pour from drinking water container, or it has a tap

HANDWASHING
10. Organized handwashing place exists (basin, water, soap)

Figure 2
Feces Disposal (3)
Acceptable, Used & Clean Solutions



SURVEY FINDINGS FOR ROSE HEIGHTS, SECTION A

In Rose Heights, Section A, baseline data was collected from 548 households in May, June, and July 1996, and the monitoring survey was conducted approximately a year later, in May 1997. As in Rose Heights, Section C, a random sample of 75 households was selected from the baseline population. Summarized in Figure 3 are the results, with comparison of baseline and monitoring findings on the 10 key indicators.

SUMMARY OF SURVEY FINDINGS

The major finding that emerges from comparison of baseline and monitoring results is one of substantial improvements in both hygiene behaviors and the number of acceptable sanitary facilities in Sections A and C of Rose Heights. In most cases, the improvements were statistically significant.

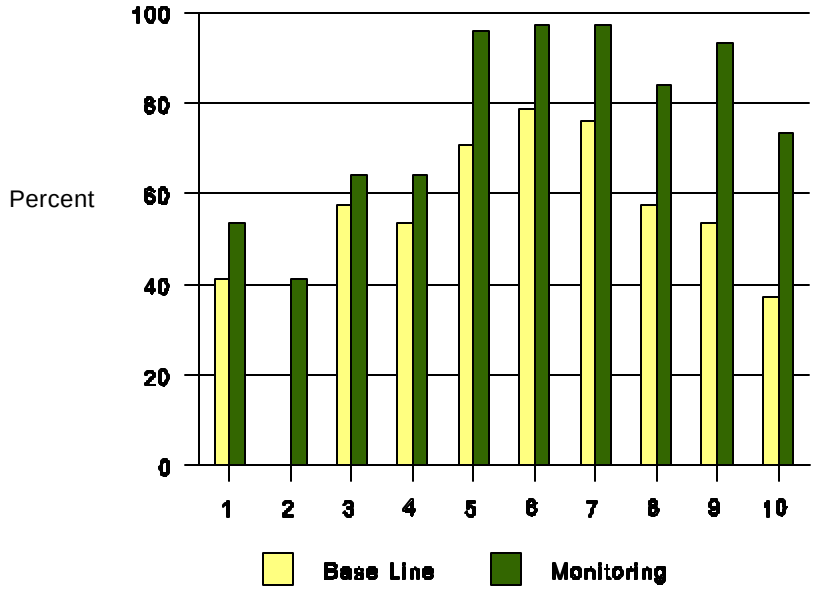
Although the overall results from Sections A and C are similar, differences do exist (see Figure 4). On the whole, improvements were greater in Section C than Section A. The differences were neither large nor consistent, except that Section C's sanitary solutions were considerably cleaner. One would have expected to see more progress in Section A because the monitoring survey was carried out there almost a year after the baseline, in contrast to where the interval was only six months. As shown in Figure 5, Section C made greater progress than Section A in 7 of the 10 indicators. One explanation may be that Section A, with 540 lots, is almost twice the size of Section C (280 lots) but has the same number of animators to motivate and promote behavioral change. Moreover, the animators in Section A received only informal training, not the formal training workshops provided for Section C animators.

Definitive interpretation of the data is not possible because the two sections may have important differences—in education and socioeconomic status, for example, two variables which correlate highly with adoption of improved sanitation and good hygiene behaviors.

During the monitoring, usage of the latrine (a valuable indicator for hygiene) was investigated in addition to the physical presence of an acceptable solution. The 10 indicators which were selected for monitoring reflect program activities well. They have provided critical information on progress made in environmental conditions and health behaviors.

It is well known that good personal hygiene and the presence of sanitary facilities are important in preventing sanitation-related infections. The challenge for program planners and implementors is to establish plausible linkages between behaviors and health outcomes. The evaluation team was not able to quantify the relationship between behavioral changes and diarrheal disease in the intervention communities. In Montego Bay, health service statistics were purportedly available but were not disaggregated for the individual intervention areas. In truth, health service statistics have very limited value for monitoring diarrheal disease patterns because the majority of cases are not seen at a health facility. A practical alternative would have been to collect data on diarrheal disease prevalence in young children during the baseline and monitoring surveys. Seasonality might have posed a problem, but such data could have provided information for making valid estimates of health outcomes related to program activities.

Figure 3
Comparison of Baseline and Monitoring Surveys of 10 Key Indicators, Rose Heights Section A



INDICATORS	1	2	3	4	5	6	7	8	9	10
Base Line	41.33	0.00	57.33	53.33	70.67	78.67	76.00	57.33	53.33	37.33
Monitoring	53.33	41.33	64.00	64.00	96.00	97.33	97.33	84.00	93.33	73.33

MONITORING INDICATORS:

FECES DISPOSAL
1. Acceptable sanitary solution (P.H.I. Criteria) completed
2. Acceptable sanitary solution (P.H.I. Criteria) under construction
3. USED
4. CLEAN

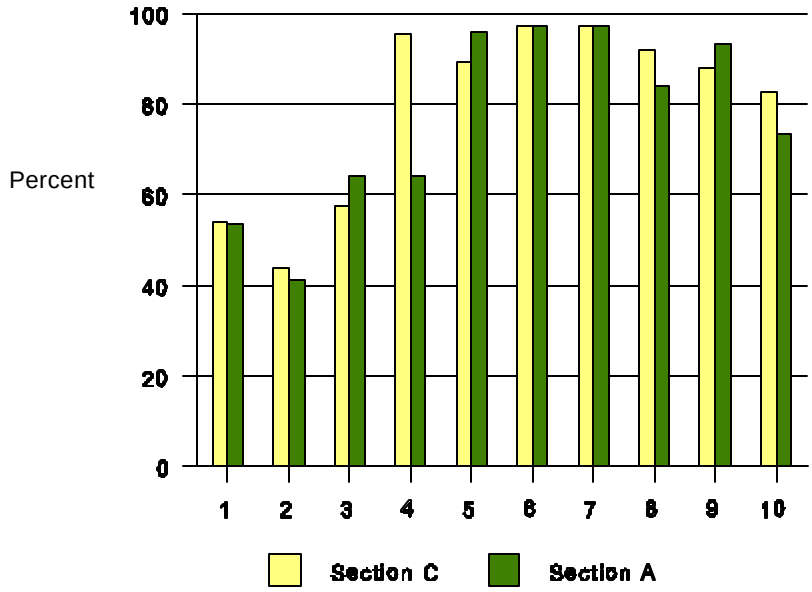
GREY WATER DISPOSAL
5. Formal or informal system exists

GARBAGE DISPOSAL
6. No water receptacles in the yard (cans, bottles, tires, etc.)
7. No discarded plastic bags in the yard

WATER HANDLING & STORAGE
8. All water storage containers are covered
9. Can pour from drinking water container, or it has a tap

HANDWASHING
10. Organized handwashing place exists (basin, water, soap)

Figure 4
Comparison of Follow-Up Monitoring Results of Behavior Changes in Section A and Section C, Rose Heights, Montego Bay



INDICATORS	1	2	3	4	5	6	7	8	9	10
Section C	54.0	44.0	57.3	95.3	89.3	97.3	97.3	92.0	88.0	82.7
Section A	53.3	41.3	64.0	64.0	96.0	97.3	97.3	84.0	93.3	73.3

MONITORING INDICATORS:

FECES DISPOSAL
1. Acceptable sanitary solution (P.H.I. Criteria) completed
2. Acceptable sanitary solution (P.H.I. Criteria) under construction
3. USED
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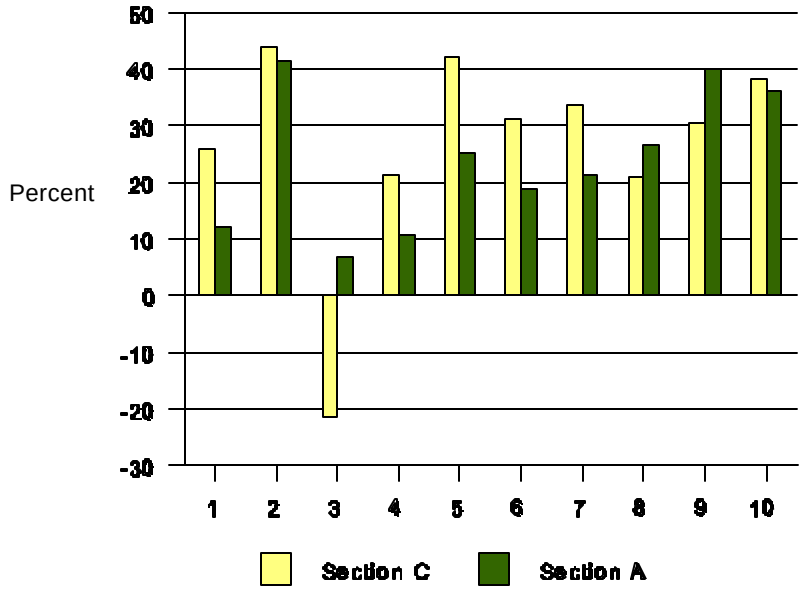
9. Can pour from drinking water container, or it has a tap

HANDWASHING
10. Organized handwashing place exists (basin, water, soap)

Figure 5
Percent Behavior Change Improvement
Section A and Section C, Rose Heights



INDICATORS	1	2	3	4	5	6	7	8	9	10
Section C	26.0	44.0	-21.4	21.2	42.0	31.1	33.8	20.8	30.5	38.3
Section A	12.0	41.3	6.67	10.7	25.3	18.7	21.3	26.7	40.0	36.0

MONITORING INDICATORS:

FECES DISPOSAL
1. Acceptable sanitary solution (P.H.I. Criteria) completed
2. Acceptable sanitary solution (P.H.I. Criteria) under construction
3. USED
4. CLEAN

GREY WATER DISPOSAL
5. Formal or informal system exists

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6. No water receptacles in the yard (cans, bottles, tires, etc.)
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WATER HANDLING & STORAGE
8. All water storage containers are covered
9. Can pour from drinking water container, or it has a tap

HANDWASHING
10. Organized handwashing place exists (basin, water, soap)

6 KEY CONCLUSIONS, RECOMMENDATIONS, AND SUCCESS FACTORS

6.1 Key Conclusions

- Overall, the project has been highly successful in meeting its performance targets. All nine of the performance targets have been or will be met (or surpassed) by the end of the project, December 1997.
- The project has been successful in influencing the public sector. In the past, MOH normally served notice if householders did not have adequate sanitation facilities. Today, policymakers have begun to change their perspective and approach to working with indigent people. They recognize the importance of changing from a punitive to a proactive approach. As stated by MOH Public Health Inspector T. K. Allen, "When you have to issue a summons, then it means that you have failed—because we should have been able to create a solution."
- The program has improved the hygiene behaviors of a large proportion of the households in the intervention areas. The difference in key hygiene behaviors between the baseline and monitoring is significant.
- The project has reduced the amount of sewage effluent discharged into Montego Bay and has prevented potentially much greater amounts in the future from polluting the Bay (with increased provision of water in the communities).
- Environmental consciousness has been raised among the community members of Rose Heights and Norwood.
- The program has demonstrated an effective model for providing basic urban environmental services to families living in poor peri-urban areas of Jamaica.
- CRDC's SSU office in Montego Bay is financially self-sufficient and institutionally sustainable. The urban sanitation program model could be replicated by CRDC in similar peri-urban areas elsewhere in Jamaica if credit were to be made available to households for the construction costs.
- The technical solutions which were offered are affordable for the target community. The solutions have achieved wide acceptance, and are technically and environmentally sound.
- As of this evaluation, 520 families are using new sanitary solutions as a result of this project.

6.2 Key Recommendations

- CRDC and CRDC/SSU senior management should spend significant effort over the next six months documenting the results of the program and disseminating the urban sanitation model and lessons learned with GOJ policymakers, NGOs, external bilateral and multilateral agencies, and other sector professionals.
- CRDC/SSU should develop an urban sanitation program "handbook" that would facilitate promotion and replication of the program in other areas of Jamaica. The "handbook" could include program "tools" such as drawings demonstrating the types of technology used, construction costs, sample contract documents with contractors, loan agreement forms for households, data

collection instruments for the monitoring and improvement system, reporting formats, and the like.

- USAID should work with CRDC to identify new sources of credit to finance the construction of sanitation solutions for additional peri-urban households in Montego Bay and other parts of Jamaica.
- CRDC/SSU should develop a brief O&M manual detailing how and when to have sludge pumped from absorption pits.
- CRDC/SSU should carry out additional monitoring surveys before the end of the project.
- CRDC/SSU should work with the local engineering consultant, Jeff Reid, to develop illustrations which show graywater management methods and how to construct them.
- Although the CRDC/SSU Cooperative Agreement did not call for it, a periodic monitoring of loan repayments to CHFC would provide useful information to both CRDC and USAID. Replicability of the on-site sanitation program depends, in part, on the success of financial agencies to recover loans to households.

6.3 Ingredients for Success

The CRDC/SSU program has proven to be an effective model for helping families living in urban informal areas to improve their environmental sanitation. Efforts to replicate this program should take into consideration the critical factors which were essential for CRDC/SSU's success. These include the following conditions:

- *Effectively involving the community in decision-making*. The CRDC/SSU staff provided technical advice and facilitated decision-making by community members themselves. Respect for local priorities has been the key to the development of CRDC/SSU's good relations with the community and the successful completion of so many new sanitary solutions.
- *Effective demand creation*. Through the efforts of the Community Officers, a climate of change has been created, which has not only increased individual knowledge and motivation. This improved climate and optimism have also changed social norms, so that the community as a whole supports actions to improve sanitation and hygiene behaviors.
- *Effective multidisciplinary teamwork*. The Community Officers and Technical Officers of CRDC/SSU have shared objectives, communicated effectively, and clearly understood their respective roles to support improved sanitation and hygiene behaviors. This sense of teamwork includes non-staff people as well: the community animators, contractors, PHIs, and engineering consultants.
- *Creating a learning organization*. CRDC/SSU? s monitoring of project implementation began early in the project cycle. Over the life of the project many adjustments and improvements were made as to how the program would be implemented. Changes were based on sound analysis of the problems, and were readily embraced and implemented once a decision was reached.
- *A balanced hardware and software approach*. CRDC/SSU works with an appropriate balance of hardware and software, where demand is created, specific technical solutions are chosen by the lot owner, and technical assistance is provided to ensure that the lot owner receives a high-quality solution. This balance is embodied in CRDC/SSU staffing patterns, where there are an equal number of Community Officers and Technical Officers with equal status in the organization.
- *Coordination with local agencies*. Though there is room for improvement in this area, CRDC/SSU is concentrating on networking with other organizations and accomplishes as much as is reasonably possible. Without sufficient coordination with CHFC and MOH in particular, the accomplishments of the project would not have been realized.

- *Access to capital financing for hardware.* The loans that were made available through CHFC were a necessary ingredient in allowing the plot holders to build their sanitary solutions. The terms of the loans—even more than the actual cost of the hardware—made the chosen sanitary solutions affordable.
- *Charging fees for services rendered*. The plot holders paid fees for the services provided by CRDC/SSU. Typical fees of J$4,500 represent 7.5% of the total J$60,000 loan for the sanitary solution. The fees allow CRDC/SSU to become financially self-sufficient and transform the plot holders relationship to the organization from "beneficiaries" to "clients."
- *Efficiency provided by use of private contractors.* There was a dramatic change in CRDC/SSU's efficiency and productivity when the decision was made for CRDC/SSU to facilitate a contracting relationship between the plot holders and existing private-sector contractors, rather than having SSU manage all the implementation components themselves.
- *Clear role as a facilitator, not implementor*. CRDC/SSU did not build any sanitary solutions or provide loans. Instead, CRDC/SSU served as an important bridge between formal governmental institutions such as CHFC and private-sector contractors, facilitating access to important inputs that allowed plot holders to improve their sanitary conditions.
- *Delivering what was promised*. CRDC/SSU staff believe that an important reason for the credibility they achieved with community members is due to the fact that they were very serious about only making promises that they could keep, and then keeping their word.
- *High-quality project management and dedicated staff with personal commitment*. One important staffing component was that some of the staff members came from the same communities they were working in and could "speak the same language" as many of the sanitation solution recipients.
- *Patience*. An important ingredient to the success of this project was recognition on the part of CRDC/SSU that the initial stages of the project required a big time commitment to make the program operate efficiently in the long run.
- *Effective and consistent external assistance*. CRDC/SSU received periodic external technical assistance from international experts during the course of the project. An important feature was that the same experts returned (some several times, in fact) to provide follow-through and support or reinforcement.

Appendixes A, B, F, G, H and I
are not available electronically.
Please contact EHP for copies.

Appendix C
Statement of Work
Technical Assistance to the Jamaica Urban Environmental Sector Program for On-site Sanitation Final Evaluation

May 1997

BACKGROUND

The Program has been assisted by EHP by an ongoing series of technical assistance interventions during its life. The original PACD of December 31, 1996 was extended to June 30, 1997, for a total Program life of 24 months. As the completion date draws near, a final evaluation of the project is required.

PURPOSE

The purpose is to evaluate the performance of the Construction Resource and Development Center (CRDC) to implement the Urban Environmental Program for On-site Sanitation. CRDC established and staffed a Sanitation Support Unit (SSU) office in Montego Bay centrally located between the beneficiary populations of the Norwood and Rosemont areas.

TASKS

1. Evaluate the Performance of the Sanitation Support Unit

In consultation with USAID/Jamaica and GOJ policy makers, carry out an evaluation of the performance of the SSU employing indicators found in the Cooperative Agreement contract documentation (Attachment II) and the original 18 month Work Plan (Attachment V). The evaluation shall determine if the Unit achieved set objectives and, in those cases where objectives were not met, the cause and degree, with the subsequent consequences, of this lack of achievement. The consultants shall pay particular regard to the sustainability of the SSU and offer recommendations, if and where merited, to improve the chances of sustaining the SSU. The issues to be evaluated include, but are not limited to, the following:

- financial self-sufficiency in regard to operating costs;
- viability of the Cash Reserve Fund;
- number of sanitation solutions approved by regulatory authorities;
- state of the information dissemination center;
- number of workshops held;
- development of social marketing tools;
- adequacy of program monitoring and evaluation tools;
- affordability of sanitation solutions offered to participants;
- actual achievements in relationship to project work plan;
- adequacy of the SSU's management and work plans;
- adequacy of SSU's staff and staffing patterns;
- the environmental suitability of sanitation solutions offered by the SSU; and
- the quality of reporting undertaken by the SSU.

2. Evaluate the Impact of Program Activities on Target Populations

The consultants shall evaluate the impact of program activities on the populations of Rosemont and

Norwood in Montego Bay as well as on associated Public Health Inspectors and small scale contractors. Issues to be addressed include, but are not limited to, the following.

Effective Utilization

- facility use by all family members
- level of possible pollution from sanitation facilities
- long-term health impact
- consistent use of the facility
- community and individual beneficial hygienic behavior changes

Sustainability

- community participation in all aspects of the program
- women in development
- linkages of program to other development efforts
- installed and functioning systems
- environmental conservation
- operations and maintenance

Replicability

- technology acceptance and adaptation by households, builders and engineers
- increased efficiency of effort and administration
- management framework
- production of useful guides and manuals
- finance and cost factors and
- others as appropriate and agreed to by USAID.

FINAL PRODUCTS

The consultant shall provide a report presenting all findings and recommendations to USAID/Kingston not later than four weeks following the contractor's departure from Jamaica. Twenty copies of the report shall be published in a 8 1/2 by 11 inch format and spiral bound. The report shall also be presented on a 3 1/2 inch disk IBM formatted and using Word Perfect 5.0 or 5.2 word processing software. If spread sheets are warranted, they shall employ Lotus 1-2-3 4.0 software

PROFESSIONAL QUALIFICATIONS AND LEVEL OF EFFORT

Program Evaluator: Level of Effort - 15 days (including travel, preparations, team planning meeting and report revision).

A senior program planner with ten years of experience designing, managing and evaluating technical assistance activities related to urban environmental management possessing the skills to lead and coordinate a wide range of technical assistance activities. This individual should possess a wide range of managerial and technical skills and experience with environmental health, urban sanitation, community participation, NGO projects and urban sociology.

Environmental Engineer: Level of Effort - 15 days (including travel, preparations, team planning meeting and report revision).

An engineer with five years professional experience in appropriate technology and alternative systems for wastewater disposal and treatment in developing country informal urban areas. The individual should possess a master's degree in civil/environmental engineering and previous experience evaluating sanitation projects.

Behavioral Change/Health Specialist: 15 days (including travel, preparations, team planning meeting and report revision).
A specialist with experience in health education, social marketing, and behavior change in connection with water and sanitation related health and environmental problems. This individual should possess ten years experience working with institutions and communities in developing health education materials and in social marketing strategies for educating communities and changing behaviors.

SCHEDULE
Given the urgent need to carry out this activity while USAID/Kingston support is still in place, the contractor should schedule this activity to begin as of June 2, 1997.

The contractor personnel should travel directly to Montego Bay to carry out the bulk of activity tasks. Upon completion of tasks in Montego Bay, but no later than the last day of the anticipated evaluation period, personnel should return to Kingston to report the team's preliminary findings and conclusions to USAID/Jamaica and others.

Team Planning Meeting:	May 29&30, 1997
Travel to Montego bay:	June 1, 1997
Field Work:	June 2-10, 1997
Report writing:	June 11-12, 1997
Travel to Kingston and debrief Mission:	June 13, 1997
Return home:	June 14, 1997
Revise and submit final report:	by June 30, 1997

Appendix D
Reports on Technical Assistance in Montego Bay

Activity Report 34. *Designing a Sanitation Program for the Urban Poor: Case Study from Montego Bay, Jamaica*, Perez, Eduardo A. and Reddaway, Betsy. Act. 123-CC, EHP, Arlington, Va., May 1997.

Report for the File 5. *Jamaica: Qualitative Report on Existing Hygiene and Sanitation Practices and Preferences among Residents of Norwood and Rose Heights in St. James*, Jackson, Jean. Act. 123-CC, EHP, Arlington, Va., December 1994.

Report for the File 6. *Jamaica Peri-Urban Sanitation, November-December 1994*, McGahey, Chris. Act. 123-CC, EHP, Arlington, Va., December 1994.

Report for the File 30. *Jamaica: Management/Organizational Development Technical Assistance to the Construction Resource and Development Centre; Montego Bay Urban Environmental Program, On Site-Sanitation Program*, Noth, Richard and McGahey, Chris. Act. 199-CC, EHP, Arlington, Va., September 1995.

Report for the File 36. *Manual of Guidelines for Selection and Design of On-Site Wastewater Disposal Systems; Kingston, Jamaica*, McGahey, Chris. Act. 198-CC, EHP, Arlington, Va., October 1995.

Report for the File 51. *Final Report on a Workshop? Jamaica*, Bateman, O. Massee. Act. 226-CC, EHP, Arlington, Va., December 1995.

Report for the File 53. *Monitoring and Improvement System for the SSU (Montego Bay, Jamaica)*, Bateman, O. Massee. Act. 226-CC, EHP, Arlington, Va., December 1995.

Report for the File 66. *Management Information System Working Paper, Sanitation Support Unit, Jamaica Urban Environmental Program*, Church, Mimi. Act. 189-CC, EHP, Arlington, Va., March 1996.

Report for the File 81. *Trip Report: EHP Follow-up Technical Assistance to the SSU, Montego Bay, Jamaica, 15-26 April 1996*, McGahey, Chris and Bateman, O. Massee. Act. 237-CC, EHP, Arlington, Va., May 1996.

Report for the File 106. *Trip Report: EHP Follow-Up Technical Assistance to the SSU, Montego Bay, Jamaica. September 23-October 4, 1996*, Bateman, O. Massee. Act. 261-CC, EHP, Arlington, Va., October 1996.

Report for the File 107. *Preliminary Results from the Monitoring Surveys, Sanitation Support Unit of CRDC, Montego Bay, Jamaica. December 3, 1996*, Bateman, O. Massee. Act. 261-CC, EHP, Arlington, Va., December 1996.

Report for the File 110. *Trip Report: EHP Follow-up Technical Assistance to the SSU/CRDC, Montego Bay, Jamaica, December 9-16, 1996*, McGahey, Chris. Act. 261-CC, EHP, Arlington, Va., December 1996.

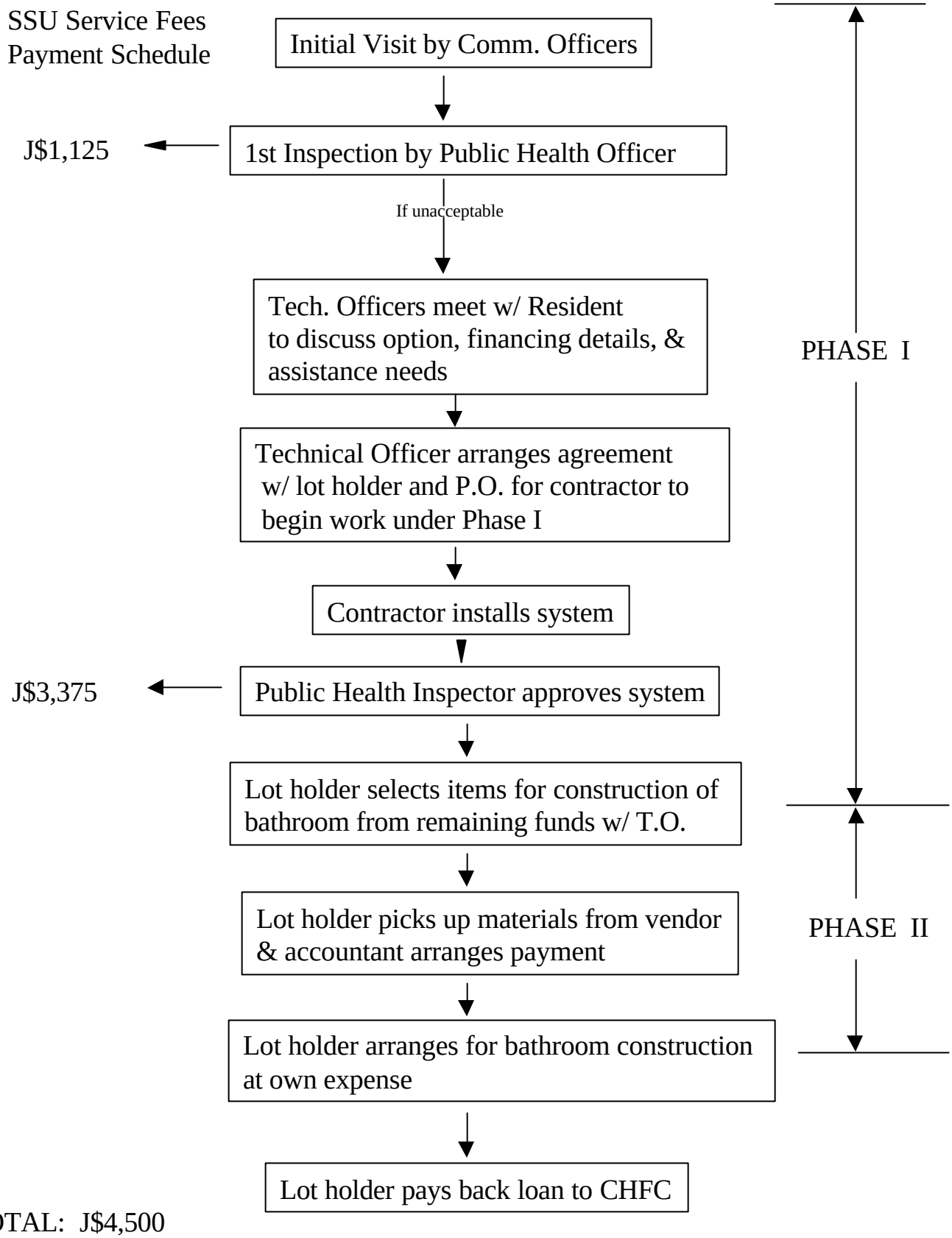
Report for the File 123. *Planning for Future Activities for Montego Bay Squatter Housing Assistance Program, Jamaica*, Perez, E. A. and Austin, John H. Act. 123-CC, EHP, Arlington, Va., September 1994.

Report for the File Act. 124-CC. *Peri-Urban Sanitation Workshop, Montego Bay, Jamaica; December 4-9, 1994*, Lanar, Fancine. Act. 123-CC, EHP, Arlington, Va., December 1994.

Appendix E
List of Contacts

Numerous homeowners in Rose Heights and Norwood
Block meeting attendees from Norwood
Garfield Stone, Contractor
Wilburfor Forrest Byran, Contractor
Michael Supersad, Contractor
T.K. Allen, Public Health Inspector
Audley Grant, SSU Driver
Caludine Scott, SSU Secretary
Delzie Murray, SSU Community Officer
Floretia Campbell, SSU Filing Clerk
Genivene McDaniel, SSU Senior Community Officer/Information Manager
Heather McFarlane, SSU Community Officer
Indeok Oak, SSU Project Coordinator
Karen Mitchell, SSU Accounts Assistant
Neville Williams, SSU Senior Technical Officer
Marsha Williams, SSU Technical Officer
Dervis Lawrence, SSU Technical Officer
Robert Clarke, SSU Accountant/Office Manager
Rosa Johnson, SSU Administrative Assistant
Jeff Reid, Engineer Consultant
Marceleen Wheatle, Health Education Officer, MOH, St James Parish
Nadia McDonald, CUSO, Health Education Officer, MOH, St James Parish
Barbara Hughes, Peace Corps, HIV/STD Program Officer, MOH, St. James Parish
Joyce Johnson, Key Community Person, Rose Heights, Montego Bay
Cleonie Downs, Key Community Person, Rose Heights, Montego Bay
Oida Hutchinson, Community Animator, Rose Heights, Montego Bay
Henry Green, Community Animator, Rose Heights, Montego Bay
Desmond Clarke, Chief Public Health Inspector, MOH, St. James Parish
Stephen Hodges, CRDC Executive Director
Mrs. Thompson, CHFC officer

Appendix J
Sanitation Solution Implementation Process



TOTAL: J$4,500