



LAC-IEE-04-53

ENVIRONMENTAL THRESHOLD DECISION

PROJECT LOCATION: Jamaica

PROJECT TITLE **Improved Production of Pineapple For Sustainable Livelihoods (IPPFSL)**
*(Grant Proposal Request under the **Ridge to Reef Watershed Project**) Project (R2RWP), Contract No.532-C-00-00-00235-00)*

LIFE OF PROJECT: **IPPFSL**– 12 months, PACD: March 2005
(R2RW – 5 years, PACD – July 2005)

FUNDING: **IPPFSLP** - J\$ 2,590,400 (~US\$ 42,400)
(R2RW -US\$ 5,900,000)

SUMMARY OF RECOMMENDED THRESHOLD DECISION: A negative determination is recommended as the IEE indicates that the proposed action will not have a significant effect on the environment. Where practicable, provisions for minimizing environmental effects have been considered and designed into the project.

IEE PREPARED BY: **Ridge to Reef Watershed Project:**
Joseph Suah - Agronomic Specialist
Hugh Graham - Watershed Mgt Specialist
Mark Nolan - Chief of Party

Bureau Threshold Decision: Negative Determination with Conditions

Comments:

The Threshold Decision is based on the completion by USAID/Jamaica of the attached IEE - PERSUAP, which follows USAID's Pesticide Procedures, 22 CFR 216.3 (b)(1)(i)(a - 1). An overall condition is that the USAID Regional Environmental Advisor for the Caribbean will review the compliance to these conditions at least once each year of implementation.

For future commodities, pests and pesticide products to be considered under this program implemented, but not covered in the present PERSUAP as amended, a further condition is stipulated. An additional amendment to the PERSUAP shall be submitted, pursuant 22 CFR 216.3 (b)(1)(i)(a - 1). Any additional amendment to the PERSUAP must be cleared by the USAID-Guatamala MEO and USAID-Caribbean REA before submission to the Mission Director for signature and before review by the BEO. Finally, the third condition is that all recommendations in the attached IEE and PERSUAP will be adhered to and all mitigating actions shall be part of the implementing agents' contracts or grants.

Based on these conditions a **Negative Determination is issued.**

CTOs are responsible for making sure environmental requirements are met. It is the responsibility of the SO Team to ensure that the SOAG and MAARDs or contracts and grants contain specific instructions to this effect.

_____ Date _____
George R. Thompson, P.E.
Bureau Environmental Officer
Bureau for Latin America and the Caribbean

- Copy to : Karen Turner, Director, USAID/ Jamaica
- Copy to : Mcdonald-gayle, Karen, Car/ORD, USAID/Jamaica
- Copy to : Dormer, Diane, Car/ORD, USAID/Jamaica
- Copy to : Batson, Howard, Car/ORD, USAID/Jamaica
- Copy to : Jeffrey Miller, REA
- Copy to : Gerald Barth, LAC/CAR
- Copy to : IEE File

Attachment: IEE

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INITIAL ENVIRONMENTAL EXAMINATION

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*(Grant Proposal Request under the Ridge to Reef Watershed Project) Project (R2RWP),
Contract No.532-C-00-00-00235-00)*

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IEE PREPARED BY: **Ridge to Reef Watershed Project:**
Joseph Suah - Agronomic Specialist
Hugh Graham - Watershed Mgt Specialist
Mark Nolan - Chief of Party

April 2004

Introduction

This Initial Environmental Examination (IEE) is a requirement of USAID cited in the Automated Directives System (**ADS 204.5.1**). The purpose is to determine the impact of pesticides to be used for a project activity and “assure that the resources made available by USAID in the form of commodities make a positive contribution to development”¹. It has been prepared in accordance with the guidelines set out in the United States Agency for International Development (USAID) *Environmental Procedures (22 Code of Federal Regulations (CFR) 216)*. **Section 216.2(e)** requires compulsory application of these procedures in the “assistance for the procurement or use of pesticides”. The procedures require an IEE to reflect the ‘reasonably foreseeable effects of the proposed action on the environment’.

Improved Production of Pineapple For Sustainable Livelihoods (IPPFSL) is a proposed sub-grant under the Ridge to Reef Watershed Project (R2RW), a bilateral environmental development initiative of the Government of Jamaica's National Environment and Planning Agency (NEPA) and the United States Government through its Agency for International Development (USAID). The Project is a five-year effort to form a synergy of interventions contributing to the achievement of USAID's strategic objective (SO2) "Improved quality of key natural resources in selected areas that are both environmentally and economically significant." It supports a community-based approach to addressing national priorities. The IPPFSL resulted from local stakeholders' concerns about the increased degradation of the environment due to poor cultural practices of pineapple and low production. The IPPFSL involves demonstration areas of pineapple using best agricultural practices, which aim not to totally eradicate pests but to bring these to manageable and economically optimal levels through the use of mechanical, cultural, and biological, and minimal chemical practices. In the Caribbean, the approach to Integrated Pest Management (IPM) has been to maximize the potential of natural agents in pest control, to inspect fields regularly to determine whether a pest problem warrants action, to utilize non-chemical methods where possible, and to minimize the use of chemicals.

Report Outline

This report provides the following:

- (i) Introduction
- (ii) A general description of the site;
- (iii) Description of Project;
- (iv) Related Activities or Partners
- (v) Lessons Learned from /similar Activities
- (vi) Integrated Pest Management
- (vii) Discussion of Environmental Impact

Description of the site

¹ ADS 312.2.1

General characteristics and topography – The project is proposed for the parishes of St. James, Hanover, Westmoreland and St. Elizabeth. The area consists of varying slopes from under 10% to over 25%. The elevation is about 2250 feet (700m) above sea level and annual rainfall in the area averages 60 inches (150 mm). In general, the rainfall pattern is bimodal with peaks in March and September. Temperature averages 32°C.

Flora/fauna – The area is of mixed vegetation from wooded areas through perennial and annual crops to pastures and rinate. Pineapple is the dominant cash crop removed during the land preparation exercise. As reflected in the checklist attached, no rare, endemic or endangered species were identified in the area.

Soil characteristics – The soil type is primarily Bonnie Gate loam, which in some areas is interspersed with many others, well distributed in the profile. The pH varies from neutral to slightly acid, which is ideally suited for pineapple.

Table 1 General Physical Characteristics of the Bonnie Gate Soils

Bonny Gate Loam
Shallow
Rapid drainage
Bed rock 12-18 inches below surface
Moisture supply low
Root penetration limited
Erosion hazard high

The soil has been sampled and analyzed to determine chemical composition. This will inform the fertility management programme and is built in the design of the project along with erosion control practices and moisture management. The Government of Jamaica’s Rural Agricultural Development Agency (RADA) extension services will provide technical support.² They will be supported by the Rural Physical Planning Division of the Ministry of Agriculture.

Description of the project

Problem Analysis

a) Background

A valid assumption is that poverty or the lack of opportunity to earn a decent livelihood from gainful occupations has led many, especially in the rural areas, to practice unsustainable farming methods. This has also prevented them from contributing to the protection of the environment. The main occupation in the Great River Watershed is farming, and this comprises the major contributor to pollution through improper or in-appropriate agricultural practices. Fortunately, many of the deleterious practices can be prevented or corrected. This provides an opportunity for the Ridge to Reef Watershed Project to make a valuable intervention. There exists a fair amount of knowledge of how to deal with many of the problems. Several farmers have expressed a willingness to change their practices and adopt new and improved ones. Other persons have expressed the desire to assist in practical and affordable interventions.

² Please see Appendix 1 for background information on these local agricultural agencies.

The demand for improved income through sustained livelihoods is great and immediate, and persons usually expect a Project to solve many of their problems. But it is not practical for the Ridge to Reef Watershed Project, given the limited time and resources, to meet all the requests. It can best use the knowledge and resources available to develop a few interventions that will have widespread, sustainable and affordable effects and that can be applied by the participants. In addition, these interventions may be replicated in other watersheds. The activities of this Project present a combination of past experience, good income generation potential, satisfaction of immediate demands, improvement of income, introduction of new resources, and will provide valuable lessons for subsequent projects.

b) Statement of the Problem

Unemployment or under-employment by residents in the Great River Watershed inhibits participation in environmental improvement practices and encourages alternate survival strategies that may be harmful to the environment. Opportunities for employment in agriculture are limited and sporadic, as most farmers and their families provide the necessary labor. Hireage is done mostly for land preparation or at harvesting. In some areas farm labor is expensive and farmers tend to invest in less demanding enterprises. The pineapple growers in the Great River Watershed experience all these issues.

Pineapple has been growing in the Great River Watershed for nearly 30 years for agro industry and the fruit trade. Recently, because of low production and unacceptable small size and poor quality, the demand for processing ended. Some of the fruits are now sold on the fresh fruits market, but at a low price.

Concentration on a single-crop allows for easier application of various strategies to attain a specific goal, and allows for greater ease in evaluating their effects.

c) Causes of the Problem

The problem of low-income generation in the Great River Watershed as it concerns agriculture, is caused by many factors. These include:

Physical

The farms vary in size from large tracts to small plots. The small land space forces many persons into undesirable agricultural practices such as over-cropping and clean cultivation. Lack of land tenure e.g. rental and illegal acquisition of land, discourages good agricultural practices (GAP) such as proper soil conservation and the establishment of perennial crops.

Cultural

Poor cultural practices are usually derived from lack of proper knowledge or from bad traditions. Many farmers grow a number of crops each of which has its own requirements of space, plant nutrition, pest control and marketing. Over Ratooning of pineapple is widely practiced and results in low yields. The lack of GAP results in deforestation, clean cultivation, over-tillage, contamination of rivers with agricultural chemicals, and poor storm water control.

Economic

Marketing of the crops becomes difficult because of inadequate and fluctuating supplies, and sometimes poor quality and size, unsure demand and prices. Many of these problems are unavoidable but can be managed. Steep hillsides are denuded and can be planted with forests or perennial fruit trees to increase income. Fragile soils can also be planted with perennial crops or treated with proper soil conservation measures. The growing of too many crops at one time should be avoided; hence the planting of pineapple is being encouraged by the Project. Some existing crops like fruit trees may be better managed e.g. by cutting them back to manageable heights. Improved cultural practices not only increase production, but also decrease the incidence of pests, diseases and weeds.

d) Local Capacities

The farmers have persisted with pineapple cultivation and have expressed a willingness to adopt improved production practices. Many have volunteered their land and some labor for the establishment of demonstration plots. There are local services for training and monitoring from organizations such as RADA, the JAS, and Pesticides Control Authority (PCA).

e) Area for Intervention

The Great River Watershed covers an estimated 34,000 acres of land spread over four parishes of St. James, Hanover, Westmoreland and St. Elizabeth, the largest part being in St. James. The land is divided into various sized parcels, from large farms to very small plots. The vegetation consists of natural forests, small woodlands and scrub pastures and rinate. The land is cropped in perennial fruit such as banana, plantain, and pineapple. Sugarcane, some root crops and some vegetables are also cultivated.

f) Population Profile

The population of the Great River Watershed is estimated at 85,000 persons spread over four townships and over 40 rural villages. It consists of primarily farming communities with the majority of the persons of school age. Most of the middle class either migrated, or commute to the urban areas for employment. Apart from agriculture, other occupations are provided in eco-tourism, mining, wood working and trading.

g) Related Activities or Partners

In order to ensure success and sustainability, it is essential that existing activities complement those of the project, and that the partners have long tenure and involvement in them. The partners include:

- Rural Agricultural Development Authority who will be responsible for the Agricultural implementation of the project.
- NEPA is responsible to enforce environmental protection laws and also to assist in preventing or ameliorating activities that can lead to damage of the environment.
- Forestry Department who will assist in the tree planting programme
- Pesticides Control Authority who will provide guidance on the appropriate use of and type of chemicals utilized for cultivation of the pineapples.
- Jamaica Agricultural Society is already organizing farmers into groups to receive agricultural benefits such as from the pineapple development project.
- Jamaica 4-H Clubs is desirous of activities that will usefully engage young persons.

- Several other local organizations with interests in agro-processing and marketing etc.

h) Lessons Learned From Similar Activities

There has not been any recent or developmental activity on pineapple or a similar crop in Jamaica in recent years. However, the experience from cocoa, another environment friendly crop, could be useful. In recent years many cocoa farms were neglected due to low economic returns. Recently the Cocoa Industry Board supported by the Ministry of Agriculture began a cocoa resuscitation drive. The development strategy entailed intense sensitization and training of cocoa farmers, followed by the establishment of demonstration plots. Provisions have been made to supply seedlings of improved cocoa cultivars to under plant low yielding ones, or to bud improved cultivars on existing rootstocks. Already there has been a significant increase in production from treated fields and many farmers are improving their cultural practices. These strategies and lessons may be transferred to resuscitating the pineapple industry in the GRW.

Integrated Pest Management (IPM) – Traditionally, farmers in Jamaica have treated pests with spraying broad-spectrum chemicals, usually in excess (above manufacturer’s specifications). According to the Food and Agricultural Organization (FAO), *the presence of pests does not automatically require control measures, as damage may be insignificant...a system of non-chemical pest methodologies should be considered before a decision is taken to use pesticides.*

The project is intended to demonstrate this approach through participatory *Integrated Pest Management (IPM)*, which puts emphasis on the process of enabling farmers to attain “agro-ecological” knowledge as a basis for sustainable production. It enhances ecological awareness and stresses the responsibility of farmers for diagnosing pest problems and actively seeking solutions best suited to the situation in their fields. IPM programs use the concept of an economic threshold level (ETL or ET), also known as an action threshold. Cost savings are also anticipated through the reduction in the purchase of pesticides and pesticide application equipment.

The list of chemicals that are to be used is found in the following table. These will only be used as required depending on the level of infestation, and if other methods such as mechanical (e.g. removal of diseased plants) and cultural (e.g. field sanitation) methods fail and the level of pests exceeds Economic Injury Levels for the farmers. The potential pesticides are on the USEPA list of approved pesticides (USEPS 40 CFR Ch.1) and are also approved by Jamaica’s Pesticides Control Authority (PCA). Farmers will be provided with the appropriate protective clothing and spraying equipment. Additionally, training in the IPM approach and the safe handling of chemicals will be conducted throughout the project by the PCA.

Table: List of Approved Pesticides for Pineapple

Pesticide	Types of pest control	Commercial name	Application rate
Malathion	Aphids, etc.	MALATHION 55	5-2lb actual/100 gal of water
Admire	Mites, cockroaches, aphids, moths, scale insects, ants, whiteflies etc	ADMIRE	1 teaspoon to the gallon
Dimethoate	Aphids, mites, grasshoppers, scale, thrips, leaf miners, etc	DIMETHOATE 2.67 EC	$\frac{3}{4}$ -1 pt./A

Section 216.3(10)(b)

Section 216.3(10)(b) of the *USAID Environmental Procedures* outlines the factors to be considered in a project using pesticides. Below are the requirements in response to the issues raised:

USEPA Registration Status

All pesticides listed are registered with the United States Environmental Protection Agency (USEPA) as General Use Pesticides (GUPs). Their USEPA PC Codes are as follows:

Malathion	-	PC Code is 057701
Admire	-	PC Code is 129059, 129099
Dimethoate	-	PC Code is 035001

The pesticides are also registered and approved by Jamaica's Pesticides Control Authority (PCA).

Extent of IPM approach

As outlined in the description of the project, IPM is the foundation and basis of this project. Training and awareness in minimizing pesticide use and maximizing mechanical and cultural farming techniques will be a major element of the project. Methods for detecting pests and monitoring, such as the use of hand lens examination, sweep nets and sticky traps, will be used by Extension Officers (when necessary) to determine pest types and levels, and the need for and method of management. Pests of economic importance include mealy bugs, thrips, root knot nematodes (*Meloidogyne spp.*) and rats. While chemical control will be judiciously applied, cultural practices will be a principal method of pest control and will include fallowing after 3-4 ratoons.

Vectors mealy bug and thrips transmit the major diseases of pineapple such as the mealy bug wilt and yellow spot, respectively. Pest control is therefore important in disease control strategies. Heart and root rot caused by *Phytophthora cinnamomi* is controlled by improved cultural practices, primarily drainage. The demonstration of proper drainage (trenching, etc.) is an integral part of the anchor project, and is incorporated into the demonstration plots. Soft rot of fruits can be prevented through proper harvesting techniques and post harvest handling.

Proposed methods of application and safety equipment

Where pesticides are required, the application will be carried out according to minimum manufacturer's specification using sprayers or as a dip, if necessary. Monitoring for pests will allow early detection and the use of physical methods, and in the case where chemicals have to be used, spot spraying if possible. Protective clothing will be provided under the project, according to manufacturer's recommendations, and expected to include coveralls, chemical-resistant gloves and boots, protective nose guard, eyewear, and chemical-resistant apron when cleaning equipment. Applications will be done to minimize the chances of contact to others not wearing protective clothing. Pesticides will not be applied when it is windy, as this would result in waste and violate the safety of persons conducting the application and others upwind.

Toxicological hazards and mitigation measures

When not handled properly, chemicals are toxic to wildlife and aquatic invertebrates. Manufacturers' guidelines will be used along with rigid safety procedures to avoid long-term toxicological hazards. **The tables below details the toxicological hazards and the mitigation measures to be adopted to eliminate negative impacts.** For example, pesticides will not be directly applied when surface water is present, during periods of precipitation, or when runoff may contaminate neighboring areas. Application will be closely monitored to ensure no adverse effects on beneficial insects or other wildlife. Applications will be minimized, according to IPM objectives and actual levels of pests detected in the field, after other cultural and physical management practices have been tried.

Table: Toxicological hazards and mitigation measures- Pesticides

Pesticide	Toxic Levels and Environmental Hazards	Mitigation Measures
Admire	Birds and fish are susceptible. Toxic to bees.	▪ Minimal application will be spot applied

	Toxic to shellfish. LD ₅₀ 152 mg/kg.	<p>or use as a dip.</p> <ul style="list-style-type: none"> ▪ Will not be used in the presence of any surface water or when rain is likely. ▪ Protective clothing will be provided.
Dimethoate	Toxic to wildlife and aquatic invertebrates. Dimethoate is highly toxic to bees exposed to direct treatment or from residues on blooming crops or weeds. LD ₅₀ 225 mg/kg	<ul style="list-style-type: none"> ▪ Will not be applied directly to areas of surface water or during periods of precipitation. ▪ Will not be applied when bees are noticeable in the area, or directly to areas where it might affect blooming plants. ▪ Groundwater table is deep, but will not be applied in areas of shallow water tables with permeable soils.
	Harmful or fatal to humans if swallowed. May cause eye irritation.	<ul style="list-style-type: none"> ▪ Protective clothing will be provided. ▪ If used in enclosed area, respirator will be provided.
Malathion	Toxic to fish, bees, aquatic invertebrates, and aquatic life stages of amphibians. Toxicity level is LD ₅₀ 1375 mg/kg.	<ul style="list-style-type: none"> ▪ Will not be applied directly to areas of surface water or during periods of precipitation. ▪ Will not be applied when bees are noticeable in the area, or directly to areas where it might affect blooming plants. ▪ Groundwater table is deep, but will not be applied in areas of shallow water tables with permeable soils.
	Harmful if swallowed. Skin contact should be avoided	<ul style="list-style-type: none"> ▪ Protective clothing will be provided.
	Harmful to humans if swallowed or absorbed through the skin	<ul style="list-style-type: none"> ▪ Protective clothing will be provided ▪ Training in handling, use, and disposal will be provided

Table: Toxicological hazards and mitigation measures – Other Pollutants

Pollutant	Toxic Levels and Environmental Hazards	Mitigation Measures
Inorganic fertilizer	<ul style="list-style-type: none"> ▪ Causes water pollution if washed into nearby rivers and streams. ▪ If over-used can cause nutrient enrichment of rivers increasing algae bloom that use up dissolved oxygen in water – affecting fish ▪ High levels of nitrate in drinking water is toxic to infants 	<ul style="list-style-type: none"> ▪ Fertility management will involve rational fertilizer application – only what the plants need - determined by soil tests conducted by the Rural Physical Planning Unit of the Ministry of Agriculture. ▪ Runoff will be insignificant given minimal use and application by direct placement methods. ▪ Use of inorganic fertilizers is part of a fertility management program. Additionally, the use of compost and mulching will add humus to the soil, increasing the ability of the soil to fix and retain nutrients - leaching will therefore be insignificant. ▪ Given groundwater depth and distance to surface waters, the risk of contamination is insignificant.
Manure	<ul style="list-style-type: none"> ▪ Nutrient enrichment of rivers if raw manure is used ▪ Contribute to fecal coliform if not broken down before use 	<ul style="list-style-type: none"> ▪ No raw manure will be used, only compost, which is applied into planting holes prior to planting. ▪ No effluent will be produced by the project. Farmers with access to livestock waste (manure) are encouraged to make compost. The composting process reduces manure to a harmless and very useful material that conditions soil and improve fertility. The heat generated by microbial decomposition in this process kills pathogens including fecal coliform.

Jamaica’s ability to regulate pesticide

In Jamaica, The Pesticides Control Authority (PCA) is the governing body mandated through the Pesticides Act of 1975 to carry out the regulation and control of pesticide usage. Its Registrar’s Office, the working arm of the PCA, addresses matters pertaining to registration, importation, manufacture, retail, use and disposal of pesticides. The Pesticides Control Regulations of 1996, updated to include a schedule of registered and banned substances, guide the PCA in its work. *For more on PCA, see their website at www.caribpesticides.net and pick ‘Jamaica’.*

Provisions for training

Training will be an integral part of the project. Several field days will be devoted to introducing the project and critical aspects of land and pest management. All aspects of IPM, from monitoring to determining economic thresholds to safe handling and disposal of pesticides, will be included in the project. R2RW will provide the training, in collaboration with RADA and PCA, and evaluate the results.

Provisions for monitoring and controlling the use of pesticides

During the project PCA and RADA will monitor the supply of and all activities involving the use of pesticides. In addition, the results of the demonstration activity will be closely determined and the lessons learned widely disseminated to extension staff, local pineapple growers, and relevant NGOs and Government agencies. Monitoring will not only be done to determine the effectiveness of any pesticides used, but also to evaluate the effectiveness of the IPM approach, such as degree to which physical and cultural practices were used instead of pesticides, and means to improve IPM to make it relevant to Jamaican farmers and to improve existing practices to reduce the level of pesticides used in farming.

Occupational Health and Safety Precaution – Emphasis will be placed on training farmers in the proper handling of pesticides, cultural practices that limit pesticide use, use and care of equipment, proper pesticide disposal methods, and protective gears and clothing.

Appropriate spray equipment will be provided and farmers will wear protective clothing during the application of pesticides. In addition to the ongoing training, field days are planned to ensure the effective transfer of know-how and experiences. All pesticide containers will be disposed of according to manufacturers recommendations, requirements of PCA, and in proper landfills or recycling centers.

Discussion of Environmental Impacts

The Integrated Pest Management (IPM) methodology that will be demonstrated through this project is designed and based on minimal use of USDA and PCA certified pesticides, which will minimize negative effects. The scoping exercise conducted using USAID/Jamaica's Environmental Guidelines (Appendix 2), indicate that there are only a few activities that could have a minimal environmental impact as a result of this project and these are of short duration. Where these impacts occur, mitigative measures have been designed into the project to minimize the effect.

With regard to the monitoring of these measures, the team led by the USAID Project's (R2RW) technical staff, in collaboration with the professionals from PCA and RADA, will provide strong technical support to ensure that the farming protocols will be adhered to. Additionally, the strong emphasis on training should ensure effective transfer of the sustainable agricultural practices.

The proposed IPPFSL should therefore result in no significant environmental impacts and the proposed mitigative measures will ensure minimal effects on human health or the environment.

Recommended Environmental Threshold Decision

A negative determination is recommended as the IEE indicates that the proposed action will not have a significant effect on the environment. It is therefore recommended that the proposed pesticide use for the Ridge to Reef Watershed Project be approved.

The IEE does not indicate any potentially unreasonable risk arising from the use of the pesticides. The project is designed using Integrated Pest Management techniques, preventive, natural genetic, biological, and cultural, which promote and encourage sound environmental management. Mitigation measures and monitoring procedures have also been included in the project design to minimize effects on the environment.

Clearance of Mission Environmental Officer

I have reviewed the above statement and concur with the recommended Environmental Threshold Decision.

Howard Batson
Mission Environmental Officer
USAID/Jamaica-Caribbean

Date

Concurrence of Mission Director

The Mission concurs with the above-recommended Environmental Threshold Decision for the Improved Production Pineapple for Sustainable Livelihoods Proposal Request under the Ridge to Reef Watershed Project.

Karen Turner
Mission Director
USAID/Jamaica-Caribbean

Date

Clearance:

SO2: DDormer _____

PDM: JTaffe _____ LVega _____

APPENDICES

APPENDIX 1:

Overview of Relevant Agencies

Rural Agricultural Development Authority (RADA) is a statutory body under the Ministry of Agriculture. It is the government agricultural extension agency, which provides support for and works with farming communities to improve crop quality and productivity. Their mandate is:

- To enhance the development of farming through an effective, efficient and sustainable extension service
- To supplement information to rural development agencies, thereby assisting to advance improvements in rural infrastructure
- To provide the supplemental social services required for the improvement of the quality of life of farm families
- To provide technical advice to farmers
- To provide a reliable agricultural marketing information service
- To assist in the implementation of specified rural development projects

In Jamaica, the Pesticides Control Authority (PCA) is the governing body mandated through the Pesticides Act of 1975 to carry out the regulation and control of pesticide usage in Jamaica. The PCA is made up of representatives from public sector organizations that are involved in pesticide control. The Authority meets monthly and sets the policies for the control and regulation of the industry. Through the Registrar's Office, which is the working arm of the Authority, matters pertaining to Registration, Importation, manufacture, retail, use and disposal of pesticides are addressed. *For more on PCA, see their website at www.caribpesticides.net and pick 'Jamaica'.*

The Water Resources Authority (WRA) of Jamaica is responsible for the management, protection, and controlled allocation and use of Jamaica's water resources. Their mission is “to ensure the sustainability of Jamaica's water resources through continual assessment and proper management, promotion of conservation and protection, and optimal development of these resources; to ensure rational and equitable allocation of the nation's water resources; and to reduce conflicts among water users.” The WRA maintains a hydrological database and provides data, information, and technical assistance to government and non-government institutions. *For more on WRA, see their website at www.wra-ja.org*

APPENDIX 2:

Identification of environmental impacts

(From new USAID environmental guidelines and checklist)

Scoping/screening matrix – The table below (Table 3) represents a screening matrix, which has been extracted from USAID-Jamaica’s Environmental Guidelines. **Minimal impacts** are considered as those with a short duration (hours, days, a few weeks); does not result in permanent damage to the environment or human health; and either none or simple mitigation measures are required. **Moderate impacts** are those spanning many weeks or months; may result in permanent damage to the environment or human health; and mitigation measures are required. **Significant impacts** are those with duration of several years and which may continue after the completion of the project; will result in permanent damage even with mitigation measures; and the mitigation measures are usually costly.

The matrix verifies the finding of minimal environmental impact for the project.

Table USAID Screening Matrix

AIR QUALITY (INCLUDING NOISE)	Minimal impact	Moderate impact	Significant impact	Can the impact be reduced or eliminated by a project change or by mitigation measures [State how]
1. To what extent will the following affect air quality?				An IPM approach will be used in the project and this ensures rationale use of pesticides. While the approach allows some pesticides, other methods are employed, for example mechanical and cultural. A decision is made to use pesticides when pests become an economic threat. Application rates are applied to reduce, not eradicate the pest. Additionally pesticides will be applied according to the guidelines of the manufacturer and farmers will be provided with protective clothing and the appropriate equipment. Training of farmers is also an integral part of the project. It may not be necessary to use pesticides more than once during a growth cycle, which is at planting time. A growth cycle (1 planting and 3 ratoons) should be about 4 years.
Use of pesticides	❖			
Use of methyl bromide (ozone depleting substance)	N/A			
Emissions from machinery used for land clearing, construction	N/A			
Fugitive dust from land clearing, quarrying, construction	N/A			
Emissions from increased vehicular movement	N/A			
Emissions from industrial facilities	N/A			
Odors from waste disposal or recycling facilities	N/A			
Odors from wastewater treatment/disposal or recycling facilities	N/A			
Noise & vibration from machinery for land clearing, construction, mining, blasting	N/A			
Noise & vibration from increased vehicular flow	N/A			
2. Is the project designed to comply with the NRCA's national standards/regulations governing air quality and air pollution? Yes___ No___	N/A			
3. What will be the extent of the impact from noise (e.g. from blasting, movement of heavy equipment such as tractors, trucks etc., driving piles)	N/A			

WATER RESOURCES <i>[E.g. rivers, springs, underground water etc.]</i>	Minimal impact	Moderate impact	Significant impact	Can the impact be reduced or eliminated by a project change or by mitigation measures [State how]
1 To what extent will the following affect water resources:				Minimal use and placement applications reduce run-off to insignificant levels.
Contamination from the use of pesticides, fertilizers, manure and other agricultural runoff	❖			
Eutrophication of surface water from fertilizer use and pollution [solid waste or wastewater] upstream	N/A			
Water abstraction from surface or underground water resources or spring	N/A			
Sedimentation/ land filling caused by agricultural practices, construction, quarrying, mining	N/A			
Pollution caused by improper waste and wastewater disposal practices	N/A			
Dams or water retention structures	N/A			
Increased surface runoff due to paved areas including roads, clearing vegetation from land	N/A			
2. Is the project designed to comply with NRCA's trade effluent standards or sewage effluent standards Yes___ No___	N/A			
COASTAL RESOURCES				
1. To what extent will the following affect coastal resources (marine water quality, coral reefs, seagrass beds, etc.)?				See note above.
Contamination from the use of pesticides, fertilizers, manure and other agricultural runoff	❖			No effluent will be produced from this project. Fertility management will involve rational fertilizer application that is 'only what the plant needs. Excess P will be fixed by the soil. Given ground water depth, leachate will have negligible impact. Pesticides are used infrequently at such low levels as to be of no threat to streams or coastal resources
Eutrophication of coastal water from fertilizer use, manure and pollution [solid waste or wastewater] upstream	N/A			
Sedimentation/ land filling of wetlands and bays caused by agricultural practices, construction, quarrying, mining upstream	N/A			
Pollution caused by improper solid waste and wastewater disposal practices	N/A			
Dredging	N/A			
Increased surface runoff due to paved areas including roads and clearing vegetation from land	❖			
Waste oil from boats and other recreational equipment	N/A			
2. Is the project designed to comply with NRCA's trade effluent standards or sewage effluent standards Yes___ No___	N/A			

LAND RESOURCES	Minimal impact	Moderate impact	Significant impact	Can the impact be reduced or eliminated by a project change or by mitigation measures [State how]
1. To what extent will the following affect land resources:				Land is already cleared. The process involves mostly replanting. Plant establishment will be by zero-tillage.
Deforestation (land clearing, fuel wood and construction)	N/A			
Soil erosion (land clearing for construction & farming)	❖			
Mining or quarrying	N/A			
Land filling (wetland or swamps)	N/A			
Disposal of hazardous waste (waste oils, PCBs, asbestos)	N/A			
Disposal of solid waste	N/A			
2. (a) Has reuse or recycling of solid waste been incorporated into the project design? Yes ___ No ___	N/A			The project is designed to introduce environmentally friendly farming techniques and to transfer these to farmers in a process of learning by doing. As a result, preventive measures such as IPM, erosion, moisture, and fertility management are integrated into the farming protocols. The project varies from traditional farming practices in the area and its execution will have far reaching impact on influencing change as the information will be shared and disseminated through the RADA extension service.
(b) Will this enhance the project or mitigate potential adverse impacts? Yes ___*___ No ___				
HUMAN HEALTH				
1. To what extent will the following affect human health:				
Fugitive dust (from construction, mining, quarrying)	N/A			
Noise & vibration (from heavy duty vehicles, blasting)	N/A			
Odors (solid waste, wastewater)	N/A			
2. Will the project cause the release of chemicals that are harmful to health, corrosive, flammable, toxic (e.g. PCBs, asbestos)	N/A			

NATURAL HABITATS & ECOLOGICAL RESOURCES	Minimal impact	Moderate impact	Significant impact	Can the impact be reduced or eliminated by a project change or by mitigation measures [State how]
To what extent will the following affect natural habitats & associated flora & fauna:				Soil conservation is a main benefit from this project
Noise & vibrations (mechanical equipment, vehicles, blasting)	N/A			
Fugitive dust (construction, mining)	N/A			
Deforestation (land clearing, fuel wood)	N/A			
Soil erosion (agricultural practices, construction)	❖			
Disposal of solid waste	N/A			
Disposal of trade & sewage effluent	N/A			
Pesticide & fertilizer use	❖			
1. To what extent will destruction or loss of natural habitat affect endemic plant or animal species (e.g. death, migration etc.)?	N/A			
2. To what extent will destruction or loss of natural habitat affect plant or animal species that are not endemic (death, migration etc.)?	N/A			
3. Will the project be situated in a protected area declared by the NRCA? Yes ___ No *_				
VISUAL RESOURCES				
1. To what extent will views, vistas & aesthetics of the community be affected?	N/A			
2. How will future extensions or expansions to the current project affect views, vistas & aesthetics of the community?	N/A			
HISTORIC & ARCHAEOLOGICAL RESOURCES				
1. To what extent will the project affect historic or archaeological resources	N/A			
2. Will project be site near to any site or structure with historic or archaeological significance? Yes ___ No *_				
OPEN SPACE & RECREATION				
1. To what extent will the project affect current and future open and recreational space	N/A			
2. Is this open and recreational space important to the community? Yes ___ No *_				

COMMUNITIES	Minimal impact	Moderate impact	Significant impact	Can the impact be reduced or eliminated by a project change or by mitigation measures [State how]
1. To what extent will the following aspects of a community be adversely affected:				
Transportation & traffic	N/A			
Population size and density	N/A			
Employment opportunities	N/A			
Housing	N/A			
Farming/agriculture	N/A			
Water	N/A			
Recreation	N/A			
2. Is there any public/community opposition to the project? Yes ___ No_* ___				
EMERGENCY RESPONSE MEASURES				
Have emergency response measures been incorporated into the project? Yes ___ No_* ___				
INDIRECT/CUMULATIVE IMPACTS				
Are there indirect and/or cumulative impacts resulting from project activities? Indirect Yes ___ No_* ___ Cumulative Yes ___ No_* ___				

REFERENCES

Jamaica Exporters' Association; Pesticide Use – Maximum Residue Levels for the USA –Peppers

United States Agency for International Development, October 1980: Environmental Procedures (22 U.S.C. 2381: 42 U. S. C. 4332)

United States Agency for International Development, January 2001: Environmental Guidelines for USAID