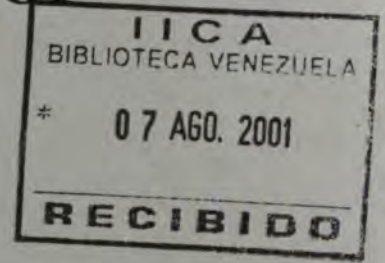


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**THE RIO COBRE WINDOW OF
SUSTAINABILITY
FINAL REPORT**



**The Inter-American Institute for Cooperation on
Agriculture (IICA) and the German Technical
Cooperation (GTZ)**



THE RIO COBRE WINDOW OF

SUSTAINABILITY

FINAL REPORT

November 2000



Prepared by Zithroy Annikie and Chris Smith

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ACKNOWLEDGEMENTS

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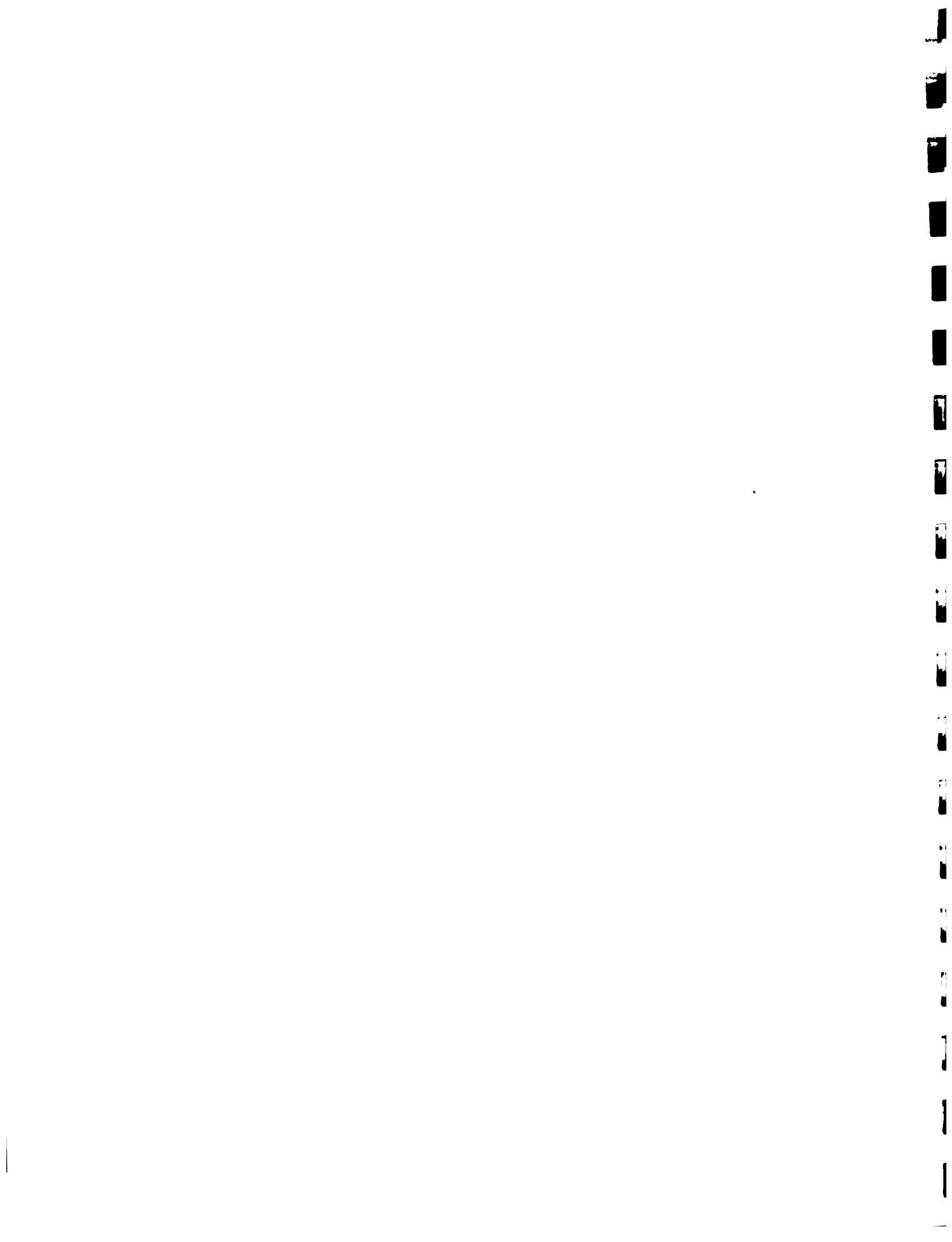


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1. EXECUTIVE SUMMARY

The Window of Sustainability (WS) in Jamaica was initiated in the Rio Cobre watershed area in the parish of St. Catherine in 1997. The Rio Cobre WS was a collaborative effort of the Inter-American Institute for Cooperation on Agriculture (IICA), the German Technical Cooperation (GTZ), the Natural Resource Conservation Authority (NRCA), the Rural Agriculture Development Authority (RADA), Forestry Department (FD), Research and Development Division of the Ministry of Agriculture (R&DD), Water Resource Authority (WRA), the Environmental Foundation of Jamaica (EFJ), US Peace Corps, Coffee Industry Board (CIB), the Caribbean Agricultural Research and Development Institute (CARDI), and other local organizations in the watershed area.

The Rio Cobre area has a number of problems including inadequate extension services, low levels of income, degradation of natural resources, low levels of environmental awareness, unemployment, and weak technology transfer. The WS project was developed to provide solutions to some of the problems facing the area by:

- Analyzing agricultural policies and their influences on integrated management of watershed and generate policy guidelines for validating in the case study.
- Defining and implement operational mechanisms that ensure coordination among national and local NGOs and community based organizations that are relevant to production, processing, marketing, and environmental issues.
- Generating a system of agricultural production with an interdisciplinary focus, the objective being to maintain production, productivity and profitability while avoiding negative impacts on the environment.
- Transferring Best Bet Technologies (BBT) according to different agro-ecosystems of the watershed area in order to enhance the adoption process and raise income.
- Monitoring at local level with particular reference to major activities (within agriculture resources domain) that have impact on the environment.

The major accomplishments of the Rio Cobre WS were the facilitation of cooperation among stakeholder institutions, the strengthening of local organizations, and the transfer of new technologies to the area such as the Goat Agroforestry Production System (GAPS), vermicomposting, and soil conservation practices. Additionally the WS assisted local organizations to develop and implement their own micro-projects (The Rio Cobre Educational Support Project; The Rio Cobre Goat and Vermicomposting Project)



2. INTRODUCTION

Since 1990, the Inter-American Institute for Cooperation on Agriculture (IICA) and the German Technical Cooperation (GTZ), have been producing concepts and instruments for sustainable development in rural areas. From this cooperation the concept of Windows of Sustainability was developed.

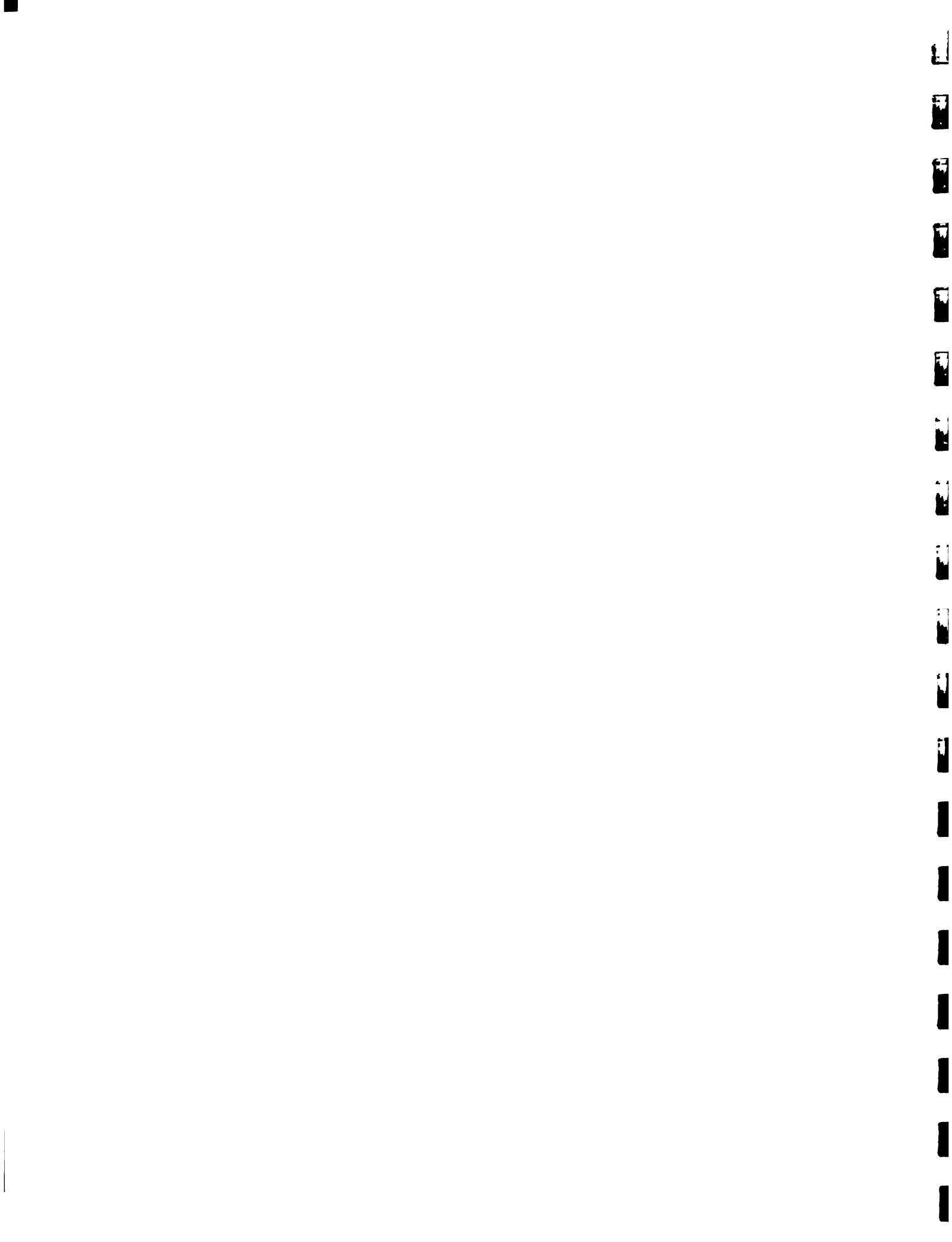
Windows of Sustainability (WS) are practical models, which aim to demonstrate and to develop *in situ* the concepts and methods of sustainable development, in its economic, social, ecological and political dimensions. WS currently are implemented in cooperation with local counterparts in Costa Rica (1997), Jamaica (1997) Mexico (1998) and the Dominican Republic (1998).

The objective of the WS is to help to improve the social, economic, and environmental status of the stakeholders in rural areas. One of the major goals is the inclusion of stakeholders in the decision making process.

The WS project has been implemented by the IICA Office in Jamaica in collaboration with local counterparts in the Rio Cobre Watershed area. The major goals of this project include:

- Analyze agricultural policies and their influences on integrated management of watershed and generate policy guidelines for validating in the case study.
- Define and implement operational mechanisms that ensure coordination among national and local NGOs and community based organizations that are relevant to production, processing, marketing, and environmental issues.
- Generate a system of agricultural production with an interdisciplinary focus, the objective being to maintain production, productivity and profitability while avoiding negative impacts on the environment.
- Transfer Best Bet Technologies (BBT) according to different agro-ecosystems of the watershed area in order to enhance the adoption process and raise income.
- Monitor at local level with particular reference to major activities (within agriculture resources domain) that have impact on the environment.

The WS in Rio Cobre demonstrated that a low cost, participatory approach could be used to successfully empower stakeholders to improve their way of life.



3. BACKGROUND

For over a decade IICA Jamaica, jointly with national institutions, has been involved in hillside agriculture projects. These were funded by international agencies such as Inter-American Development Bank (IDB), USAID and most recently by EU. Its concentration has been on cropping systems research in hillside areas that deal with annual and perennial food crops to address two major problems. First, that of generating additional income for hillside small farmers, and secondly introduction of tree crops in the cropping systems that prevent soil degradation. These experiences are mostly obtained through "On Farm Adaptive Research" (OFAR), and hence has meant working directly with institutions of research and extension on the one hand, and with small farmers of Jamaica on the other.

The concept of WS has been under conceptualization since about 1992 in IICA-GTZ, and takes into consideration a holistic view of natural resource management within the context of agriculture production and marketing systems. This integral vision such as in watershed management provides, not only a systematic approach to define sustainable cropping systems that include tree crops, but also allows more integral analysis of economic and social variables within a given organizational and institutional setting.

Most of Jamaica is hilly, has high rainfall and easily erodible soil. Arable land is under pressure and many small and medium scale farming is done on hillsides often in watersheds. There is evidence of high pollution of water from heavy use of agro-chemicals, and increasing salinization on the lowlands from agricultural activities. Excessive soil losses are observed in many hillside farming areas, and deforestation is increasing for industrial and agricultural purposes or from encroachment on marginal lands and forest edges. Measures to address these problems are therefore urgently needed to compensate the negative effects in social, economic and technical aspects.

The commitment of the country to incorporate considerations of "Sustainable Agricultural Production Systems" is reflected in the significant financial resources expended in this area. Conservative estimates indicate that between US\$30-40 million worth of grants and loans had been devoted to programs and implementation of measures to arrest degradation of agricultural resources prior to 1997. However, these grants and loans rarely produced measurable indicators suggesting that the aforementioned problems were not being addressed.

4. PROJECT STAFF

Mr. Zithroy Annikie IICA-GTZ Consultant 1997-2000

Dr. Bomat Ramikrishma IICA Consultant 1997-1998

Mr. Christopher Smith US Peace Corps Volunteer 1999-2000



5. PROJECT OBJECTIVES

5.1 Within the framework of IICA-GTZ and the local partners, the WS in Jamaica was designed to produce concrete experiences of sustainable rural agriculture. The objective was to produce tangible, practical cases of sustainable rural development, and develop a conceptual model for the promotion and evaluation of sustainable agriculture. This model can then serve as a solid foundation for IICA-GTZ and other participating entities to process and share information.

5.2 General Goals

- Analyze agricultural policies and their influences on integrated management of watershed and generate policy guidelines for validating in the case study.
- Define and implement operational mechanisms that ensure coordination among national and local NGOs and community based organizations that are relevant to production, processing, marketing, and environmental issues.
- Generate a system of agricultural production with an interdisciplinary focus, the objective being to maintain production, productivity and profitability while avoiding negative impacts on the environment.
- Transfer Best Bet Technologies (BBT) according to different agro-ecosystems of the watershed area in order to enhance the adoption process and raise income.
- Monitor at local level with particular reference to major activities (within agriculture resources domain) that have impact on the environment.

5.3 Specific Goals:

- Formalize institutional cooperation
- Formalize and strengthen farmers association
- Promote Goat Agroforestry Production Systems (GAPS)
- Expansion of vermiculture technology
- Develop research proposal for organic pesticide
- Assist farmers association to develop micro-projects
- Select indicators of sustainability at the watershed level
- Identify funding for testing of Matrix indicators
- Identify key indicators at the farm level and collect information

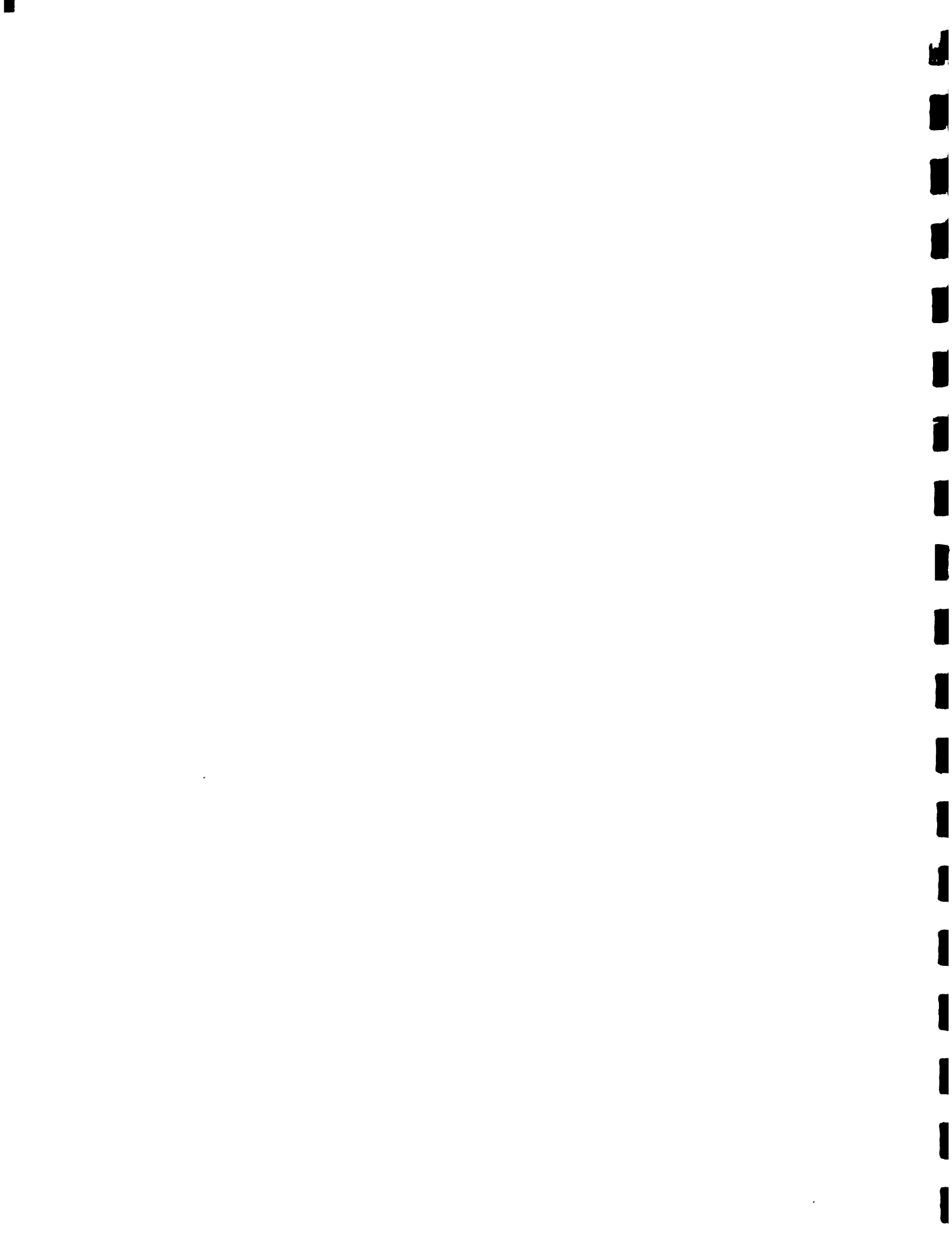


6. LOCATION



A view of the upper Rio Cobre watershed area

The Rio Cobre watershed area is located in the northeastern part of the island, 40km from Kingston. It covers an area of approximately 64,000 hectares with rolling terrain. The climate is humid tropical with annual rainfall of between 1300mm – 1900 mm. The soils are deep with good drainage. Population density is less than 3 persons per hectare. The area has good roads that link the main population centers of the region. One third of the local farmers belong to producers' organizations that market coffee, cocoa, sugar cane, pepper, nutmeg, mango, avocado, vegetables, and various species of lumber trees.



Some of the Communities of the Rio Cobre Watershed

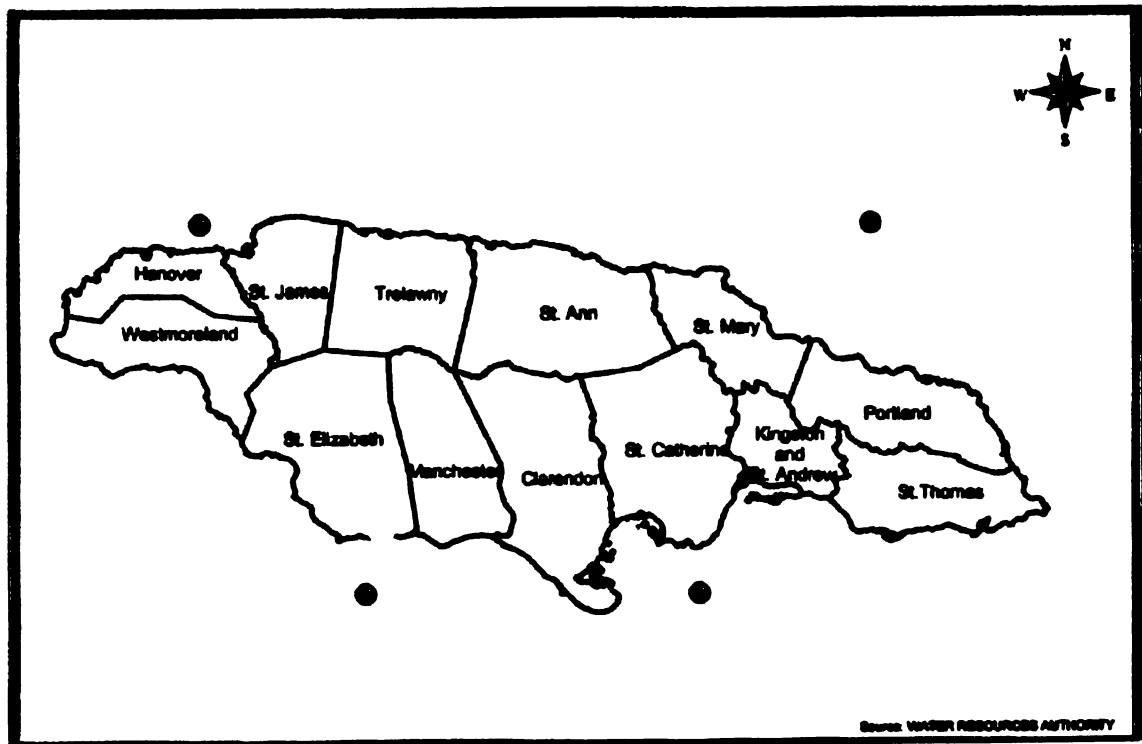
Upper Watershed

Facey
Guys Hill
Top Mountain
Troja

Middle Watershed

Ewarton
Gobay
Hampshire
Ham Walk
Harewood
Jubilee Town
Linstead
Redwood
Riversdale
Riversdale– Crawle
Williamsfield

JAMAICA PARISH MAP





7. STRATEGY

The IICA-GTZ WS project in Jamaica was a four-year effort (1997-2000) undertaken jointly with counterparts such as NRCA, RADA, Forestry Department, R&DD, WRA, EFJ, US Peace Corps, CIB, CARDI, and other local organizations in the watershed area.

The project had a direct relationship to the interests and needs of national institutions in the area of policies on natural and agricultural resources, and addressed some of the bottlenecks encountered by donor agencies.

The following strategies were utilized in the project:

The overall activities programmed were intended to provide field experiences to formulate a conceptual framework and prepare practical guidelines for other watershed areas of the country.

The training of national counterparts was based on project activities to ensure institutional continuity with operational commitments of local organizations.

The efforts of IICA-GTZ were articulated with NRCA, RADA, Forestry Department, R&DD, WRA, EFJ, US Peace Corps, CIB, CARDI, and other local organizations in the watershed area.

IICA-GTZ initiated problem solving oriented OFAR activities in order to generate information about crop bio-diversity and cropping / livestock systems (agro-forestry) that increase farm income, but also conserve the natural resource in the watershed area.

8. BENEFICIARIES

The direct beneficiaries of the project were identified at two levels:

- 8.1 The first level includes institutions involved in sustainable development and natural resource conservation. They are NRCA, RADA, Forestry Department, R&D, WRA, EFJ, US Peace Corps, CIB and CARDI.
- 8.2 The second target group included NGOs, Community Based Organizations and OFAR farmers at the upper, middle, and lower level of watershed. Most of these beneficiaries were identified in the first semester of the project implementation. Some of the leaders and farmers in the area were known to IICA Jamaica in their HASP-USAID project (1989-93)

— — — — —

9. ACTIVITIES

9.1 Introduction Soil Conservation Practices

Farmers were trained in a variety of methods of soil conservation. These included gully plugging, trash barriers, live barriers, inter-cropping.



Farmers being trained to use an A-Frame to line conservation barriers on hillsides in Harewood





Pineapples used as conservation barriers in Redwood

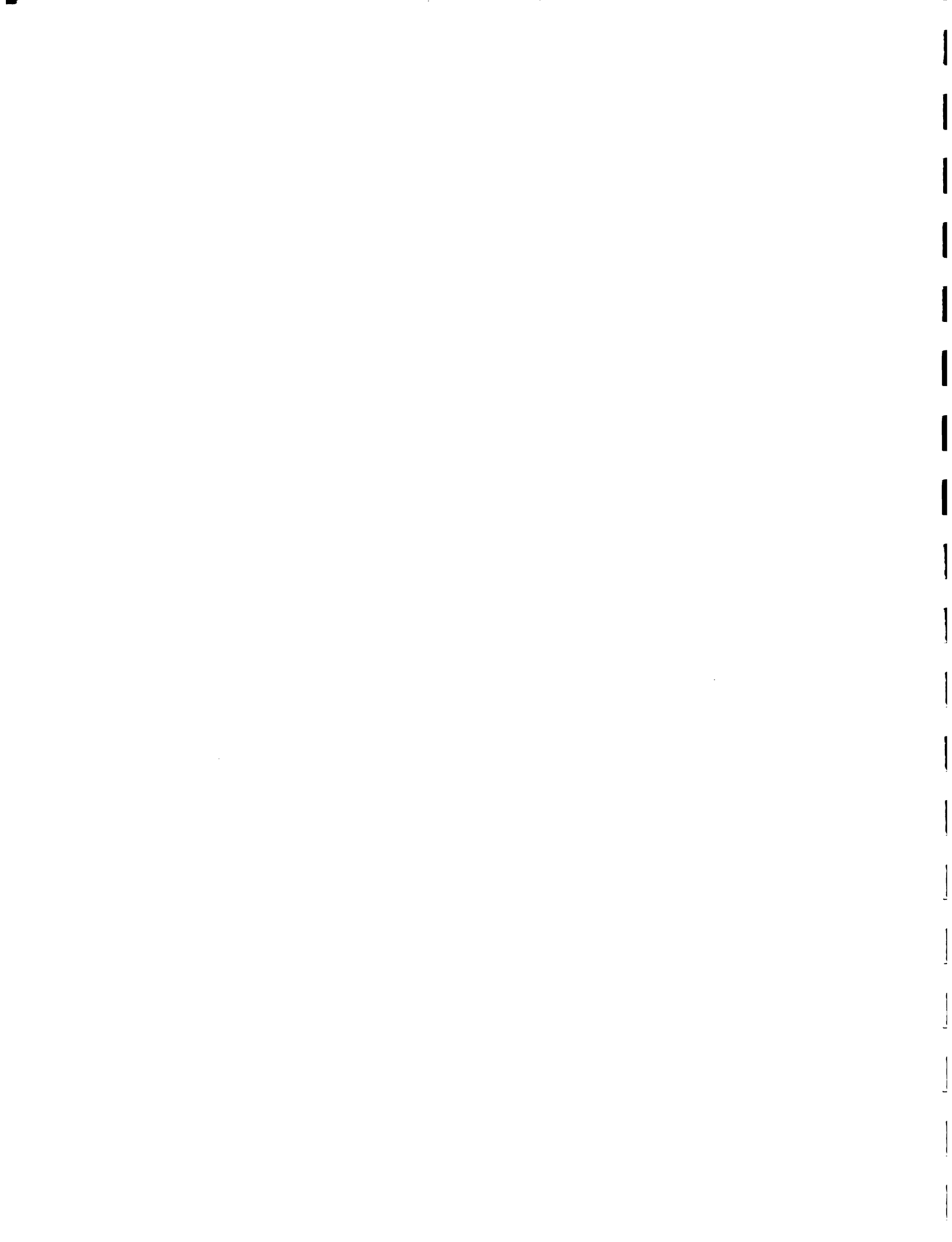




A gully plug constructed to reclaim a severely eroded area in Redwood

9.2 Introduction of Cash Crops

Cash crops such as peanuts, pumpkin, and pineapples were introduced to farmers in the project area. These crops were introduced to level out income generation throughout the year.



9.3 *Assisted in the formation of four rural women's groups*

The formation of these women's groups came about in response to the low levels of participation of women in development projects. These groups developed two micro-projects (A sewing and embroidery project, and a goat production project) to help address some of the problems facing the area.



A meeting of a women's group in Riversdale

9.4 *Training of Farmers*

Farmers were trained in a number of areas including micro-project preparation, project implementation, record keeping, land husbandry, livestock herd management, vermiculture technology, and small business operation. Field trip training sessions have included goat production farms in St. Elizabeth and Clarendon, a chips factory in Portland owned and operated by a women's group, a workshop on community based organization management in Kingston, and an organic farm in St. Catherine.





Farmers being trained in the preparation of micro-projects at the RADA office in Linstead

9.5 *Introduction of the Goat Agroforestry Production System (GAPS)*

In 1998 the project funded a trip to Costa Rica by an area farmer to observe sustainable technologies. After observing the GAPS in Costa Rica the farmer returned to Jamaica and constructed his own GAPS. Through the Local Management Committee (LMC) this technology was disseminated to farmers in the area. Enthusiasm for this technology was extremely high and as a result this technology became the major focus of the project. GAPS technology has become a major small farming enterprise across the island.



A Goat Agroforestry Production System goat house in Guys Hill

9.6 *Assisted in the formation of the Rio Cobre Goat Breeders Association (RCGBA)*

In response to the increasing popularity of GAPS, the farmers created the Rio Cobre Goat Breeders Association in November 1999.





President (Mr. Franklyn Brown) and Vice President (Ms. Marlene Jackson) of the Rio Cobre Goat Breeders Association

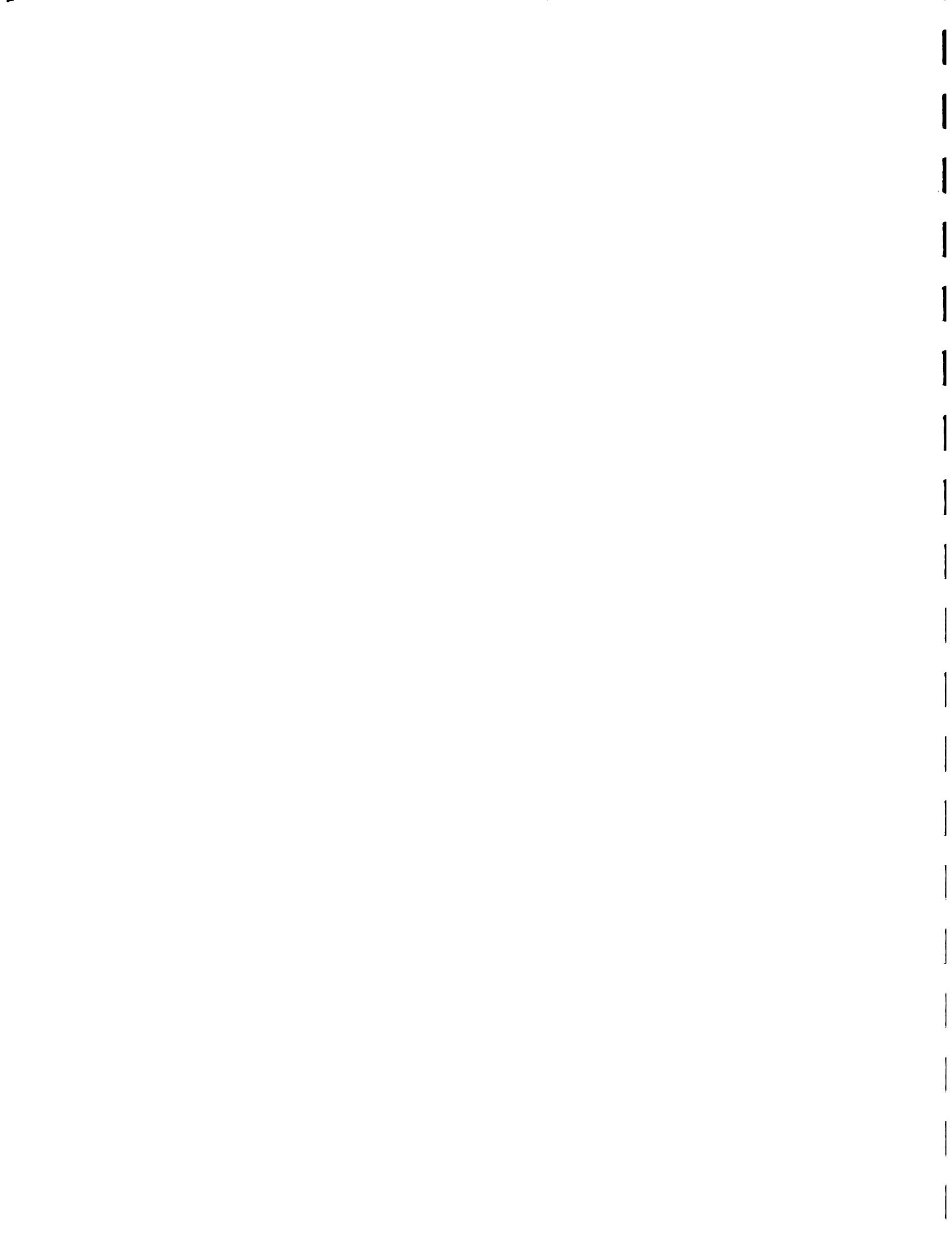


Quarterly meeting of the RCGBA held at the RADA office in Linstead

9.7 Developed Micro-projects

- 9.7.1 The Rio Cobre Education Support Project was created by the LMC and funded at a level of J\$40,000 by EFJ. This project was designed to expose and educate stakeholders in the different ways of managing the watershed and to involve stakeholders in policy discussions.**
- 9.7.2 The Rio Cobre Goat and Vermicomposting Project was created by the RCGBA and funded at a level of J\$2.1 million by EFJ. This project was designed to address some of the major environmental problems facing the stakeholders of the Rio Cobre**
- a. Introduction of environmentally friendly and economically efficient agricultural practices;**
 - b. Creation of a sustainable plan to improve the environmental, social, and economic conditions in the Rio Cobre watershed;**
 - c. Education of local farmers with respect to the impact of agriculture on the health of the watershed;**
 - d. Utilization of polluting farm and agro-industry waste in the creation of a marketable organic fertilizer.**

The production of goats has the potential to achieve the above mentioned goals in the watershed. Advantages of goat rearing include simple integration into the small farming systems found in the area, a high rate of multiplication, the utilization of farm waste and intensively grown fodder, easy management by women and youth, and the ability to significantly contribute to farm income.



10. ACHIEVEMENTS

10.1 Institutional Strengthening

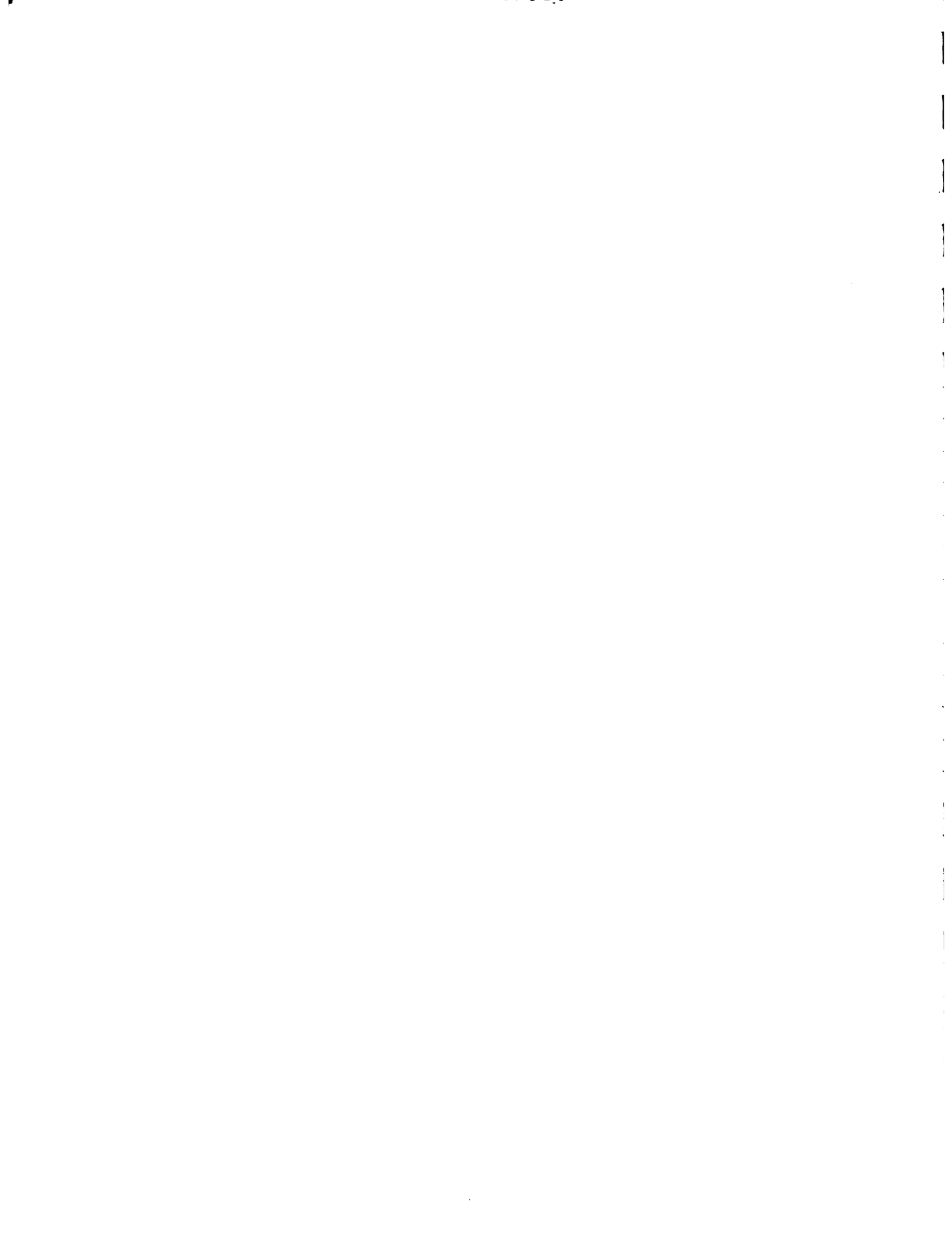
The Jamaican institutions have played a critical role in the execution of the WS project by coordinating activities that increase the level of environmental awareness. These institutions are IICA-GTZ, NRCA, RADA, Forestry Department, R&DD, WRA, EFJ, US Peace Corps, CIB, and CARDI. The WS project brought these institutions together at bimonthly meetings in 1997. By 1999 the institutions were meeting on a monthly basis and were planning and implementing training activities together. In early 2000 these institutions formulated and signed a working agreement. This document established a formal framework for cooperation and implementation of activities that respond to agreed proposals developed to improve the sustainability of agricultural development. The major areas of cooperation are joint training activities, support of micro-projects, implementation of projects, preparation of publications, research and studies, financial support to the project, and any other mutually agreed area.

10.2 Strengthening of Local Organization

The Local Management Committee (LMC) was the primary community based farmer organization of the project area. The LMC was composed of community leaders from the various Farmer Action Committee Teams (FACT) in each district. Farmers involved with the LMC received training in farm management, micro-project development and implementation, and environmental awareness. In 1999 the LMC developed The Rio Cobre Education Support Project that was successfully implemented.

In 1997 members of the LMC formed four rural women's groups to increase the participation of women in the projects in the area. These women's groups designed two micro-projects to increase the level of involvement of women and youth in agriculture.

The Rio Cobre Goat Breeders Association (RCGBA) was formed in 1999 by farmers of the LMC to specifically target goat production. Interest in goat production in the area was very high due to the introduction of GAPS technology. The RCGBA developed the Rio Cobre Goat and Vermicomposting Project, which was implemented in June 2000.



10.3 Transfer of Technology

The most popular technology introduced was the Goat Agroforestry Production System (GAPS). GAPS is a semi-intensive goat production system made up of three components: a goat house, fodder bank, and vermicomposting bin. IICA-GTZ developed a GAPS manual that is used widely by extension officers and interested goat producers on the island. As of November 2000 twenty GAPS have been constructed across the island as a direct result of the WS. Funding is in place through The Rio Cobre Goat and Vermicomposting Project to construct additional 12 GAPS over the next two years.

The WS has promoted the use of vermicomposting technology across the island. Eleven schools and over 30 local 4-H clubs have received this technology in the form of the Red California Earthworm *esenia foetida* and educational materials. The CIB received the earthworms and conducted experiments to determine the effect of the worms on coffee pulp waste. In addition the RCGBA has constructed a medium scale vermicomposting unit to transform goat waste and coffee pulp into marketable organic fertilizer.



Photo showing broken down goat waste and Red California Earthworms (*esenia foetida*)

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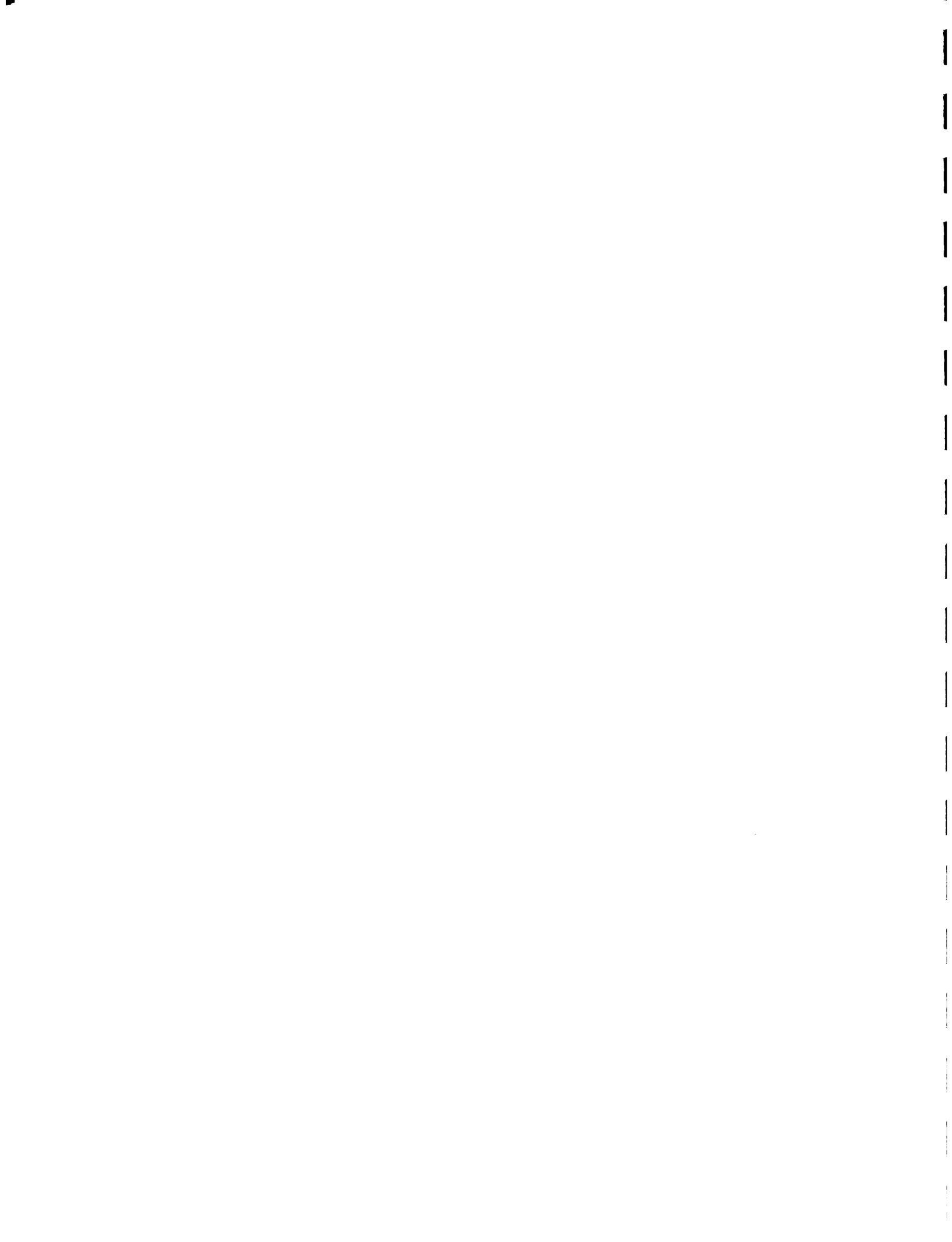


Rio Cobre Goat and Vermicomposting Project vermiculture bins in Redwood.

Farmers were trained in the use of a number of soil conservation technologies. They were shown how to build and use their own A-Frame to establish contour barriers (trash barriers, live barriers, stone barriers, etc.) and to plant crops on the contours.

Farmers were trained in the establishment of gully plugging at field days conducted by IICA-GTZ, NRCA, RADA, and the LMC.

Farmers were introduced to new methods of crop production including intercropping and the production of cash crops.



11. CONSTRAINTS AND RECOMMENDATIONS

11.1 Transportation

Inadequate transportation severely restricted the movement of individuals to meetings and training sessions and the movement of products to markets. This problem has been evident throughout the life of the project and it was only through the use of vehicles of the IICA-GTZ technician and the RADA extension officers that the high levels of community participation were obtained. As IICA-GTZ support comes to an end, and as the EFJ funded initiative comes online, the farmers have been attempting to obtain a vehicle for the RCGBA. The continued success of the project is heavily dependent on the farmers obtaining a vehicle.

11.2 Leadership

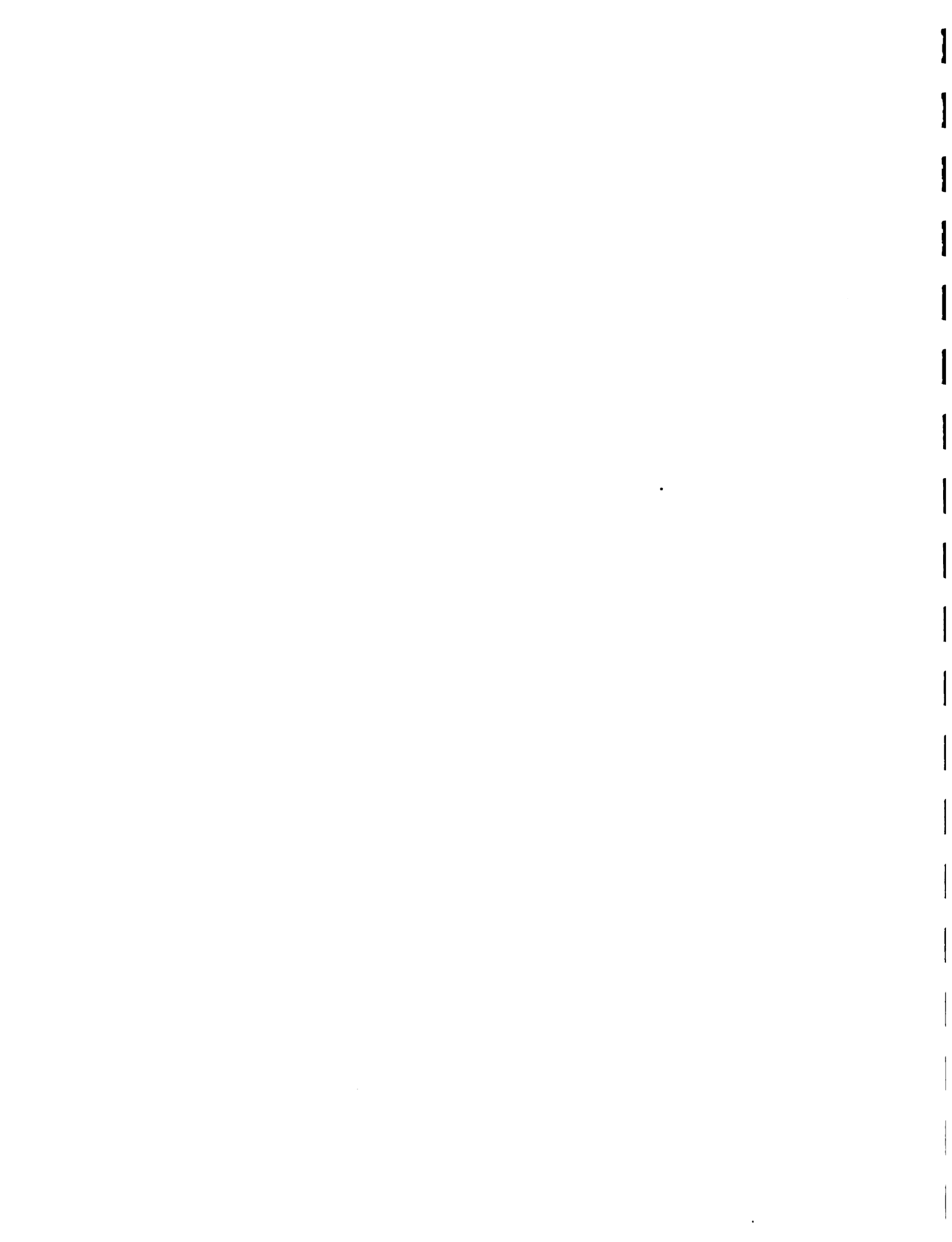
A low level of community leadership continues to hinder the effectiveness of local organizations. In every community organization involved with the project, only a handful of farmers were prepared to take up a real leadership role. This problem is due to a number of factors including the low levels of education, inadequate training, and a mistrust of community organizations. It is vital that potential leaders in the area continue to be trained in the area of management. It is also necessary to create conditions such as regular open discussions that encourage individuals to step forward and take up leadership responsibilities.

11.3 Institutional Leadership

The project area requires a greater level of institutional leadership to support the community organizations. During the project life IICA-GTZ has been the lead institution with respect to support of the LMC, women's groups, and RCGBA. It is important that RADA increase its leadership role as IICA-GTZ funding comes to an end.

11.4 Marketing

There is inadequate marketing capacity by farmers in the project area. Many farmers attempt to source their market after they have started to produce their crops. While the project has attempted to address this problem through training sessions, there is still a need for training in running small farms as businesses.



11.5 Technical Personnel

The low ratio of technical personnel to farmers has resulted in slow dissemination of technologies. In the project area there are more than 17,000 farmers and only six RADA extension officers. To increase the spread of efficient agricultural technologies, the number of extension officers must be increased. Additionally, extension officers with graduate education should take on a greater role of interacting with farmers in the field.

11.6 Record Keeping

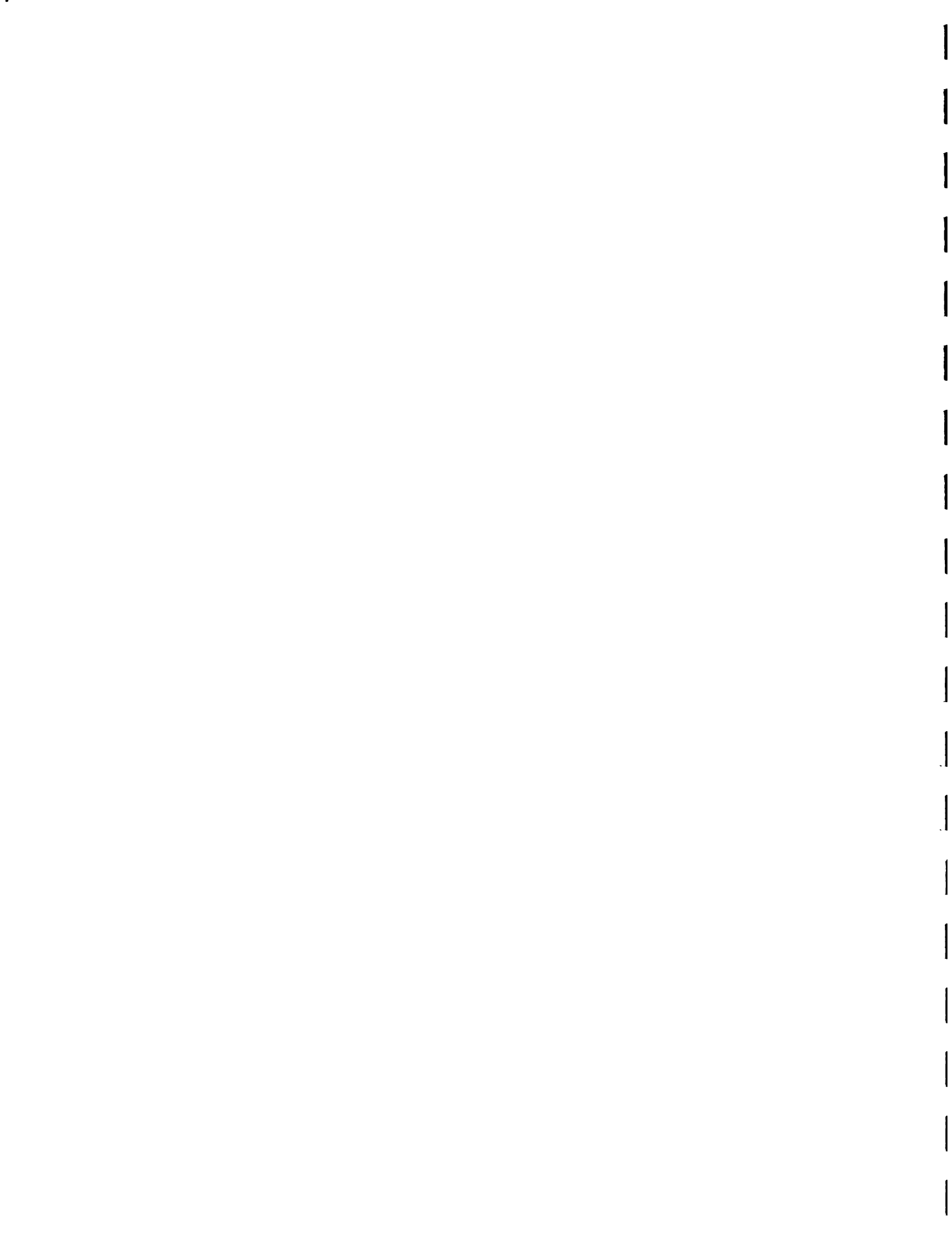
There is very little proper record keeping among the farmers in the area. This contributes to poor planning and inhibits the maximization of profits from the farm. One factor behind this problem is the high rate of illiteracy among farmers. Training in record keeping must continue.

11.7 Planning

The lack of long term planning continues to plague farmers. There is a low level of investment in small farming and this has prevented any significant increases in production among small farmers.

11.8 Value Added Products

There is a scarcity of value added products being developed and produced within the farming communities of the Rio Cobre. To date the only value added product produced by small farmers in the project area is organic fertilizer by the RCGBA. There is a serious need for more value-added production in the area.



12. FUTURE INIATIVES

12.1 Milk Production

The GAPS by increasing goat production allows for the future production of fresh milk. The current efforts in Rio Cobre are to upgrade the local goat with the Nubian breed. The Nubian is not only a good meat goat, but also a good milk producer.

12.2 Cheese Production

In addition to the production of fresh milk, cheese production represents an opportunity to gain added value from goats. Jamaica currently imports goat cheese to satisfy the demand of gourmet restaurants in tourist areas and Kingston. This large domestic market makes the production of goat cheese very attractive.

12.3 Development of Organic Pesticides from local plant Materials

Recently there has been an emphasis on the production of organically grown agricultural products. One of the greatest problems facing the farmers of Jamaica is the use of synthetic chemicals to control pests on crops. There are several local shrubs that seem to display pest repellent properties. Farmers and exporters of farm produce in Jamaica would benefit from research into the possibilities of utilizing local plants to produce an organic pesticide.

13. FINANCIAL STATEMENT

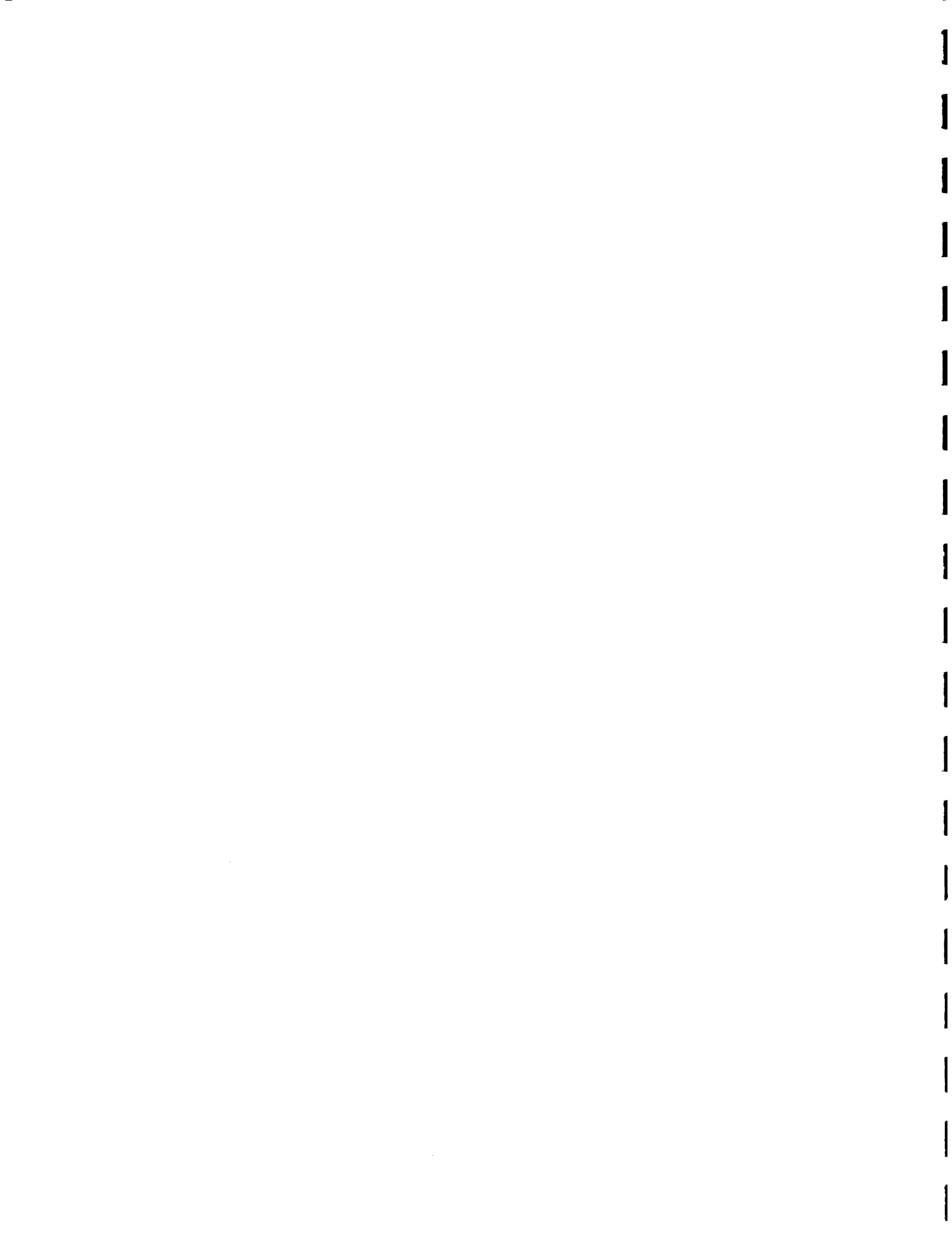
Below is the table of the Rio Cobre WS expenditures.



TABLE 10.1
JAMAICA: IICA/GTZ WINDOWS OF SUSTAINABILITY PROJECT EXPENDITURE REPORT,
IICA/GTZ CONTRIBUTIONS,
April 1997 - October 2000 (US\$)

CATEGORIES OF EXPENDITURES	1997		1998		1999		2000		TOTAL	
	IICA	GTZ	IICA	GTZ	IICA	GTZ	IICA	GTZ	IICA	GTZ
Personnel Cost:										
Coordinators:										
Bommat Ramakrishna	30,000.00		44,540.00						74,540.00	
Enrique Rieger			11,978.00						11,978.00	
Chelston Brathwaite			10,000.00		12,000.00		12,000.00		34,000.00	
Zithroy Annikie		13,570.97		20,421.96		22,743.48		18,271.65		75,008.06
Consultants:										
Glenroy Ennis		722.01		481.34						1,203.35
Dexter Thompson							1,691.00			1,691.00
Franklyn Brown				278.55					278.55	278.55
Other Technical Support Personnel Costs:										
Nelly										0
Carlos Rieche										0
Laura Ramirez										0
Peace corp Volunteer										0
- Sergio Vaquias	4,000.00								4,000.00	4,000.00
Operational Costs: *										
Secretarial/Logistical Support	2,500.00	11,040.80	3,000.00	3,878.13	3,500.00	3,593.46	3,000.00	4,665.21	12,000.00	23,177.60
Office Space/Stationery	1,000.00		1,000.00		1,000.00		1,000.00		4,000.00	4,000.00
Other Costs:										
Farm visit to Costa Rica	5,389.00	724.00							5,389.00	724.00
TOTAL	42,889.00	26,057.78	70,796.55	24,781.43	16,500.00	26,336.94	16,000.00	24,627.86	146,185.55	247,989.56

Notes:
* Include the cost of travels, materials, equipment, supplies, etc.



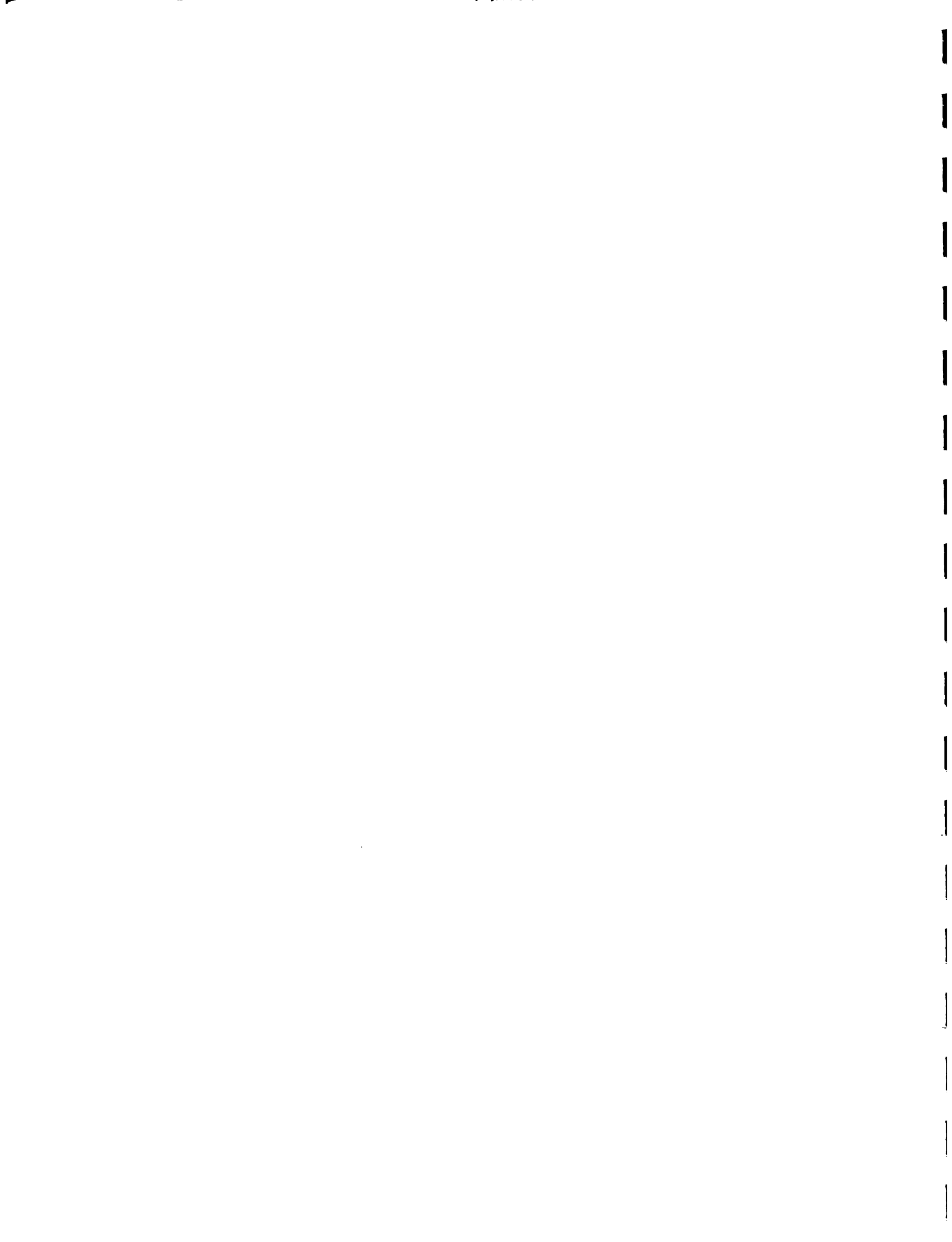
14. SUMMARY

The Window of Sustainability Project has served as a catalyst for the development of low cost, environmentally friendly, and sustainable agricultural technologies in the Rio Cobre area and the island of Jamaica as a whole.

This project was designed to include the input of the stakeholders at all levels. Farmers were given the opportunity to state problems that affected them and it was the farmers who came up with ideas for solutions to those problems. One of the greatest advantages of the Window of Sustainability model is that it allows for flexibility in the project implementation. When farmers expressed interest in the GAPS technology, the project was able to respond to these interests by shifting its primary emphasis from cropping systems to a livestock system. As a result, the project farmers felt empowered because they made their own decisions.

The fact that this project did not have a large budget proved to be a valuable asset in that all of the beneficiaries were forced to take a participatory approach. Lacking large financial resources, the various institutions in the area had to collaborate to achieve their development goals. As a result of the project, these institutions are better equipped to cooperate in the future. The other beneficiaries, small farmers, did not receive handouts and instead invested their own time and money into the new technologies brought to the area by the project. These farmers are more independent and self-sufficient because they are not totally reliant on inputs from projects.

The Rio Cobre Window of Sustainability Project can be used as a model for development in other watersheds in Jamaica and other countries. The WS has shown how a relatively small amount of money, combined with collaborative efforts of stakeholders, can make a significant impact on a rural community. While each application of this model will differ due to local variables (economic opportunities, social situations, the political landscape, cultural history, etc.), the fundamental element for success is the collaborative, participatory approach.



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