SMALL-SCALE IRRIGATED AGRICULTURE PROMOTION PROJECT

PROJECT IMPACT ASSESSMENT

Prepared For

GHANA IRRIGATION DEVELOPMENT AUTHORITY
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

By

MANAGEMENT DEVELOPMENT & PRODUCTIVITY INSTITUTE
POST OFFICE BOX 297
ACCRA, GHANA

TEL 66 65 97/8/9
FAX 66 65 90
E-mail: mdpi@ghana.com

JANUARY 2002

Table of Contents

LIST OF TABLES III

LIST OF FIGURES IV

EXECUTIVE SUMMARY V

1. INTRODUCTION 1

1.1 SCOPE OF REPORT 1
1.2 SOURCE OF AUTHORITY 1
1.3 TERMS OF REFERENCE 1
1.4 ACKNOWLEDGEMENT 1

2. BACKGROUND INFORMATION 2

2.1 SSIAPP STAKEHOLDERS 2
2.2 OBJECTIVES OF SSIAPP 2
2.2.1 Overall Goal 2
2.2.2 Project Purpose 3
2.2.3 Expected Outputs 3
2.3 IMPLEMENTATION OF SSIAPP 3

3. METHODOLOGY OF STUDY 4

4. SITUATIONAL ANALYSIS BEFORE SSIAPP 5

4.1 FARM ASSETS AND FARM IMPLEMENTS 5
4.2 FARMERS ASSOCIATION MEMBERSHIP: BENEFITS AND CONSTRAINTS 5
4.3 LAND HOLDING AND USE 5
4.4 FARMING TYPE 6
4.5 LAND PREPARATION AND PLANTING 6
4.6 PRODUCTION AND YIELDS 6
4.7 CASH EXPENDITURE 7
4.8 IRRIGATION AND WATER MANAGEMENT 7
4.9 TECHNOLOGY DEVELOPMENT AND TRANSFER 8
4.9.1 Extension Service 8
4.9.2 Training 8
4.9.3 Credit and Marketing 8
4.9.4 Life Style 8
4.9.5 Factors affecting start of cropping season 9

5. PROJECT IMPACT ASSESSMENT 10

5.1 IMPROVEMENT OF THE FARMING SYSTEM 10
5.1.1 Land use 11
5.1.2 Water use 12
5.1.3 Means of labour 13
5.1.4 Labour use 14
5.1.5 Credit system 14
5.1.6 Transfer of Technology 16

5.2 CONTRIBUTIONS OF SECTIONS TO PROJECT GOAL AND SUBSEQUENT IMPACT ON THE FARMING SYSTEM 17
5.2.1 Training *17*
5.2.2 Water Management *19*
5.2.3 Farm Management, Extension and Farmers' Organisation *22*
5.2.4 Agricultural Machinery *24*
5.2.5 Cultivation *25*
5.3 IMPROVEMENT IN FARMERS INCOME 26

6. ISSUES ARISING FROM THE STUDY 36

7. SUSTAINABILITY OF THE PROJECT 37

7.1 CAPACITY BUILDING 37
7.2 SPECIAL PROVISIONS AND FEATURES 37
7.3 CONTINUED DELIVERY OF SERVICES 38
7.4 MAINTENANCE OF PHYSICAL INFRASTRUCTURE 38
7.5 LONG-TERM INSTITUTIONAL CAPACITY 38
7.6 SUPPORT FROM KEY STAKEHOLDERS 39
7.7 DISPARITY IN DEVELOPMENT 39

8. CONCLUSION AND RECOMMENDATIONS 41

8.1 CONCLUSIONS 41
8.2 RECOMMENDATIONS 42

APPENDIX 1: QUESTIONNAIRE FOR FARMERS 44

APPENDIX 2: QUESTIONNAIRE FOR SECTIONAL HEADS 45

APPENDIX 3: QUESTIONNAIRE FOR IMPLEMENTORS 46

APPENDIX 4: EXPENDITURE AND INCOME FIGURES FOR SELECTED CROPS 47

List of Tables

Table 5.1:	Impact of SSIAPP's Activities on Farmers	10
Table 5.2:	Increase in yields after SSIAPP	11
Table 5.3:	SSIAPP water management	13
Table 5.4:	Impact of machinery on farming activities	14
Table 5.5:	Impact of input credit scheme on farming activities	15
Table 5.6:	Impact areas of SSIAPP input credit scheme	16
Table 5.7:	Farmer responses on technology acquired under SSIAPP	16
Table 5.8:	Proportion of farmers trained before inception of project	17
Table 5.9	Evaluation of irrigation management	20
Table 5.10:	Evaluation of water availability	20
Table 5.11:	Evaluation of water scheduling	21
Table 5.12:	Evaluation of irrigation system maintenance	21
Table 5.13:	Evaluation of Support Services – Cooperatism	22
Table 5.14:	Evaluation of Support Services – Extension Services	23
Table 5.15:	Evaluation of Support Services – Credit facilities	23
Table 5.16:	Evaluation of Support Services – Farm inputs	24
Table 5.17:	land Preparation methods	25
Table 5.18:	Sources of seed – percentage of farmers	26
Table 5.19:	Increase in farm income	27
Table 5.20:	Response to status of standard of living after inception of SSIAPP	27
Table 5.21:	Selected impact areas of SSIAPP for farmers	35

List of Figures

Figure 5.1:	Income and expenditure per acre for cabbage	29
Figure 5.2:	Income and expenditure per acre for okra	29
Figure 5.3:	Income and expenditure per acre for rice	30
Figure 5.4:	Income and expenditure per acre for maize	30
Figure 5.5:	Income and expenditure growth rates for maize	31
Figure 5.6:	Income and expenditure growth rates for rice	31
Figure 5.7:	Income and expenditure growth rates for okra	32
Figure 5.8:	Income and expenditure growth rates for cabbage	32
Figure 5.9:	Ratio of expenditure to income for maize	33
Figure 5.10:	Ratio of expenditure/income for rice	33
Figure 5.11:	Expenditure/income per acre for cabbage.....	34
Figure 5.12:	Ratio of expenditure/income for okra.....	34

Executive Summary

The Small-Scale Irrigated Agriculture Promotion Project (SSIAPP) is a project type technical cooperation between the Governments of Ghana and Japan. It is being implemented by the Ghana Irrigation Development Authority (GIDA) and the Japan International Cooperation Agency (JICA). It is a five-year project that commenced in August 1997.

The Ashaiman and Okyereko Irrigation Schemes are the two pilot schemes selected for the SSIAPP.

The overall objective of the project is to:

- establish a suitable farming system for small scale irrigated farming; and
- increase the income of farmers.

POSITION

A cursory observation of the prevailing system and focus group discussions with farmers reveal that the problems of untimely and inadequate levels of inputs, which, hitherto, characterized the pre-project period, have been successfully surmounted after the inception of the project by the reorganization and empowerment of the cooperative society.

Irrespective of the disparity in the rate of development between the two models, farmers on the whole, have acquired more knowledge and skills in land preparation, seed preparation, water management, fertilizer application, soil improvement and cooperatism. The project period is characterized by better farm management and more effective management of resources.

There is an overwhelming acknowledgement of the positive impact of SSIAPP on farming activities by the farmers. 100% of respondents in both locations made this confirmation. The impact of the project is evidenced in increased yields at both sites.

Farmers have also acknowledged the increase in income that has enabled them to manage their off-farm expenditures and acquire some possessions. Farm income has increased by an average of 63% in Ashaiman and 64% in Okyereko. A significant comment by farmers is their satisfaction with the regularization of their income during the project period.

A total of seventy nine (79) farmers or 99% of respondents at Ashaiman rated the overall impact of SSIAPP on farming activities as good to very good. At Okyereko, ninety five (95) or 100% of respondents rated the overall impact of SSIAPP as good to very good.

Despite the farmers' acknowledgement of an improvement in the farming system, and the corresponding increase in their income level, several issues were mentioned as requiring consideration and attention. These include:

- accommodation problems - farmers are considering the concept of a settlement farm;
- marketing problems (particularly for rice) as a result of the collective selling strategy: currently, there are tonnes of rice in stock waiting to be sold;
- high rate of interest on input credit and the "short" payment period of six months;
- land sizes which are considered relatively small to generate considerable income;
- lack of or low level of cash credit;
- low rate of follow-up visits from extension officers;
- irregular training for farmers;
- low level of democracy in cooperatives;

Other problems have emerged in the course of project implementation that also require prompt and effective response. They include:

- poor commitment on the part of the Government of Ghana to release matching funds for running the project and furnishing the Training Centre;
- poor incentives such as allowances for Ghanaian counterpart staff;
- improper crop production planning in Ashaiman;
- poor dissemination of information arising from sectional activities;
- lower than expected commitment to cropping activities on the part of Okyereko farmers;
- poor land leveling and irrigation infrastructure despite the rehabilitation;
- difficulty with convincing farmers to pay fees for machinery usage despite the training;
- low price of paddy;
- relatively high cost of production; and
- frequency of changes in experts and organizational direction.

PROPOSAL

A number of recommendations are made and these include:

- The project period should be extended to allow the gains made during the project implementation to be consolidated and to prepare the ground for project sustainability;

- Provision should be made for increased extension services to reduce the gap between research staff and farmers;
- Changes in research topics that have not come to a conclusion should not be encouraged;
- More training should be regularly conducted for farmers;
- Farmers should be encouraged to visit other project sites as part of their training;
- The cooperatives should educate farmers more on the operations of such groupings to make them more receptive to strategies;
- There is the need to develop a realistic irrigation service charge that should be paid by all farmers to ensure project sustainability;
- Farmers should be taught the need to minimise waste in all operations in order to reduce the cost of production;
- The cooperatives should improve the capabilities of their marketing sections to effectively market their produce and create public awareness for their activities;
- There is the need to establish standards for crops; Export transactions should have agreements/contracts;
- There is the need for the Government of Ghana to provide on schedule her counterpart funding as well as funds to furnish the Training Centre;
- GIDA should also allocate some budget towards the furnishing of the Training Centre;
- GIDA should incorporate in its budget an element of project allowance to be paid to the project staff as incentive, which must have clear basis;
- The irrigation infrastructure should be rehabilitated again where necessary;
- There should be adequate control of the use of chemicals on the farms;
- Proper drainage systems should be instituted to avert salinity build up;
- The development of locally made and locally maintainable equipment should be maintained;
- The cooperative societies should be strengthened to impose sanctions on offenders where applicable;
- The possibility of increasing land sizes should be considered in order to increase the income levels of farmers but without sacrificing productivity;
- Training should be extended to all farmers and foreign training could also be extended to farmers on a limited scale;
- Participants of training programmes should be encouraged to share their knowledge with other farmers;
- The issue of scheme manager should be settled as soon as possible;
- The possibility of sourcing micro-credit facility from providers should be considered since the cooperatives can independently manage such transactions without the intervention of GIDA; and
- The issue of accommodation for farmers on the non-irrigable side of the project site could be looked at and discussed.

1. Introduction

1.1 Scope of Report

This report is on the post evaluation of the Small-Scale Irrigated Agriculture Promotion Project (SSIAPP) implemented by Ghana Irrigation Development Agency (GIDA) and Japan International Co-operation Agency (JICA) from 1997 to 2001.

The report covers the background information of the project, the methodology adopted for the post evaluation, findings of the post evaluation, conclusions and recommendations.

1.2 Source of Authority

By a letter of reference ID/ADM-2305/SF.III^{A}/III dated 27/09/01, the Management Development and Productivity Institute (MDPI) was invited to submit a proposal in respect of PROJECT EVALUATION.

The assignment was awarded on contract and signed by Mr. T.K.A. Bibilazu of MDPI and Mr. M. Tomikata of SSIAPP/JICA.

1.3 Terms of Reference

Following discussions between MDPI team and that of SSIAPP, our understanding of the assignment is to conduct post-implementation evaluation to assess the impact of the project in terms of farming systems and standard of living of the farmers.

1.4 Acknowledgement

The Management Development and Productivity Institute is grateful to the GIDA and JICA for the opportunity to share its expertise with industry. The Institute is also grateful to the farmers at both Ashaiman and Okyereko, the Executives of the Co-operatives and the National Service Personnel at the Irrigation Development Centre (IDC).

2. Background Information

The Small-Scale Irrigated Agriculture Promotion Project (SSIAPP) is a project type technical cooperation between the Governments of Ghana and Japan. It is being implemented by the Ghana Irrigation Development Authority (GIDA) and the Japan International Cooperation Agency (JICA). It is a five-year project that commenced in August 1997.

The Ashaiman and Okyereko Irrigation Schemes are the two pilot schemes selected for the SSIAPP.

The Ashaiman Irrigation Scheme is located in the Greater Accra Region of Ghana and it is about 25km from Accra and about 5 km from Tema. The Scheme was completed in 1968 and at the moment has an area of about 60 ha under irrigation. The average age of the 90 farmers is 49 years. Five of this number are women. Significant about the farmers is that they were all taking loans from market mummies to finance their farming activities. This practice grossly affects their productivity, as the money is not released on time.

The Okyereko Scheme was completed in 1979 with the help of the Japanese Government and is located at Okyereko which is about 60 km from Accra. The Scheme has a potential area of 111ha for irrigation. The average age of the 96 farmers is 44 years. There are seven (7) women among the farmers. Besides market mummies, the farmers at Okyereko were taking loans from money lenders and other sources to finance their farming activities.

2.1 SSIAPP Stakeholders

The main stakeholders of the project are:

- The Government of Ghana;
- The Government of Japan;
- Ghana Irrigation Development Authority (GIDA);
- Japan International Cooperation Agency (JICA); and
- The Farmers.

2.2 Objectives of SSIAPP

2.2.1 Overall Goal

- The overall goal of the project is to improve the farming system in respect of irrigation schemes under GIDA; and

- Increase the income of farmers.

2.2.2 Project Purpose

The purpose of the project is to establish a model farming system in irrigated agriculture area under the supervision of GIDA.

2.2.3 Expected Outputs

By the end of the five-year period, the following outputs should have been achieved:

- Farmers' situation and farming systems of irrigation schemes are analysed;
- Component technology is improved;
- Farming system is verified in the two model schemes;
- Farming supporting system is improved in the two model schemes; and
- Extension officers, staffs of farmers' organisations and farmers are trained.

2.3 Implementation of SSIAPP

The project is being implemented by

- Ghana Irrigation Development Authority (GIDA); and
- Japan International Co-operation Agency (JICA).

A team of six (6) Japanese experts and about 20 Ghanaian counterpart staff are implementing the project. The main project office is at the Irrigation Development Centre (IDC) at Ashaiman. Five technical support sections of the project include:

- Cultivation;
- Water Management;
- Farm Management, Extension and Farmers Organisation;
- Agricultural Machinery; and
- Training.

3. Methodology Of Study

The methodology adopted for the post evaluation was as follows:

- Review of baseline survey ;
- Questionnaire design;
- Questionnaire administration and collation;
- Questionnaire analysis;
- Comparison of analysis with baseline survey;
- Direct interaction with the individual farmers and leaders of the Co-operatives (focus group discussion);
- Deduction of trend of project.

The baseline survey was thoroughly reviewed to gather indicators for comparison. Based on the study, questionnaires to gather the current situation of the project were designed.

The questionnaires captured data from the five components of the project:

- Farm Management, Extension and Farmers Organisations;
- Cultivation Section;
- Agricultural Machinery Section;
- Water Management; and
- Training Section.

Sample questionnaires are attached in the Appendices.

4. Situational Analysis Before SSIAPP

4.1 Farm Assets and Farm Implements

The most commonly used implements in both Schemes were the hoe, cutlass, sickle, spade/shovel, mattock, pick axe and the levelling board. The farmers, however, used the services of a power tiller machine.

4.2 Farmers Association Membership: Benefits and Constraints

Farmers associations existed in both schemes. Among the benefits received from the Association were:

- Assistance during social functions;
- Supply of certain inputs – fertilizer, seed;
- Access to water;
- Provision of farm machinery service for land preparation; and
- Extension services.

The Associations however were confronted by many constraints, which affected their performance. These constraints included:

- Lack of financial support;
- Lack of visionary leadership;
- Poor attitude of members;
- Lack of training for the executives;
- Poor knowledge of the concept of co-operatives;
- Lack of full time staff for the society;
- Lack of office facilities; and
- Lack of administrative procedures.

4.3 Land Holding and Use

The average land size for farmers on the Ashaiman scheme before the project was about 1.3 acres. It was about 2.4 acre for the farmers at Okyereko.

Land use implies the use to which the land was put in the cropping year. Cropping intensity in Ashaiman was 85% to 90%. The main crops cultivated were rice, various vegetables and maize.

Cropping intensity in Okyereko was 50% and the main crop cultivated was rice.

4.4 Farming Type

About 36% of the farmers in Ashaiman cultivated only rice, while 33% cultivated only vegetables and 31% cultivated both rice and vegetables.

Within the Okyereko area, a single crop was cultivated throughout the year – maize, cassava or vegetables.

4.5 Land Preparation and Planting

Land preparation is done with tractor at Okyereko followed by ploughing and harrowing. Planting is done by broadcasting. In Ashaiman, farmers use the services of a power tiller.

Seed preparation before planting in both schemes involves

- Seed selection;
- Seed treatment;
- Germination test;
- Soaking; and
- Pre-germination.

4.6 Production and Yields

It was realised that in Ashaiman, yields during the rainy season were higher than the dry season. There were two categories of planting season namely:

- Rainy season planting; and
- Dry season planting.

For each season farmers either adopted direct planting or transplant methods. Farmers at Okyereko however were engaged only in direct planting and it was during the dry season.

The average yield of rice for the two seasons and the two types of planting are summarised in the table below:

Rice Yield at both Ashaiman and Okyereko before Ssiapp

Planting Type	Ashaiman		Okyereko	
	Rainy season	Dry season	Rainy season	Dry season
Direct planting	3.6 (t/ha)	3.2 (t/ha)	0	3.8(t/ha)

Transplant	4.0 (t/ha)	3.4(t/ha)	0	0

The proportions of Income and expenditure for farming activities at both Schemes before SSIAPP were as tabulated below:

Sowing Type	Season	Proportion (%)	
		Income	Expenditure
Direct	Dry	54.2	45.8
	Rainy	59.4	40.6
Transplanting	Dry	25.5	74.5
	Rainy	47.1	52.9

4.7 Cash Expenditure

Cash expenditure over here is limited to expenses incurred on farm work only. In both Schemes, the expenses cover the following areas:

- Farm inputs:
  - Seed cost
  - Fertilizers
  - Weedicides
  - Others
- Land development;
- Labour costs:
  - Handpicking
  - Harvesting
  - Sowing costs
  - Drying
  - Bird scaring
- Haulage costs;
- Irrigation Service Charge;
- Post-harvest costs:
  - Threshing
  - Winnowing

4.8 Irrigation and Water Management

Prior to the project, water delivery to farmers' plots at both Ashaiman and Okyereko was not reliable. Farmers had to fight over water for days.

4.9 Technology Development and Transfer

4.9.1 Extension Service

Extension services were provided by staff of GIDA. The main activity was in the provision of technical assistance at both Schemes. Activity areas like credit, input supply and marketing were neglected. Little attention was paid to irrigation.

4.9.2 Training

The survey indicates that the farmers at Okyereko had not had any training in farming. However a few of them had seen demonstrations before.

Only twenty-one percent (21%) of the farmers at Ashaiman had had some form of training. Such training was organised by the Food and Agriculture Organisation (FAO).

4.9.3 Credit and Marketing

Most farmers at Ashaiman depended on credit from market mummies to whom the produce was pledged. These same women dictated the selling price of the produce. The credit was in cash form for farm inputs.

Farmers sought credit from the market mummies for the simple reason that no collateral nor guarantors were required. Only few people took loan from other source.

Unlike Ashiaman, the farmers of Okyereko had access to credit from a variety of sources. Notable among these were:

- Friends and family members;
- Churches;
- Banks ;and
- NGOs.

At both Schemes, marketing of the farm produce was very poor. Oftentimes the produce was sold soon after harvest when prices would be low. The biggest problem is the preference of the market for imported rice.

There was no structure to oversee the marketing aspect of the business.

4.9.4 Life Style

Ashaiman is a town just five kilometres from Tema. It is connected to the national grid. Okyereko on the other hand is a rural village and not connected to the national grid. The farmers at Ashaiman had television sets and other electrical gadgets whereas those at Okyereko had none.

The people of Ashaiman have access to potable drinking water and good toilet facilities. These facilities do not exist at Okyereko.

4.9.5 Factors affecting start of cropping season

Factors that affected the start of the cropping season at both Schemes included:

- Lack of machinery;
- Lack of water;
- Insufficient of capital;
- Lack of seed; and
- Lack of labour force.

5. Project Impact Assessment

5.1 Improvement Of The Farming System

An analysis of a farming systems survey conducted by the Farm Management, Extension and Farmers' Organisation Section of SSIAPP on the model schemes between October and November 1998, concluded that the start of the farming season is delayed as a result of the lack of credit, capital, and machinery. Lack of credit and capital especially affected the timeliness in certain operations vital to high yields such as weeding and fertilizer applications. The end result is the persistent low yields (Farm Management, Extension and Farmers' Organisation). Prior to the inception of the project, rice yields per acre averaged 17 bags.

In Ashaiman, crop areas in pre-SSIAPP period averaged 1.47 acres with the maximum being 5.00 acres. The equivalent figures for post-SSIAPP period are 1.1 acres and 1.8 acres respectively. Of the 73 farmers who responded to the questionnaire, 52 (71.2%) and 9 (12.5%) cultivated only one crop and two crops respectively before the project. For the post-project period, the corresponding figures were 47 (64.4%) and 19 (26%) respectively.

At Okyereko, pre-SSIAPP period was characterized by farms sizes averaging 1 acre. Farm sizes under post-SSIAPP period averaged 1 acre with 3 acres as the maximum size. Of the 90 respondents, 10 (11%) grew one crop, 29 (32%) cultivated two crops, while 25 (28%) cultivated 3 crops respectively during the period before the inception of the project. 56 of the farmers currently cultivate one crop, while 17 cultivate two crops.

A cursory observation of the prevailing system and focus group discussions with farmers reveal that the problems of untimely and inadequate levels of inputs, have been successfully surmounted after the inception of the project by the reorganization and empowerment of the cooperative society. Table 5.1 shows the reaction of the farmers to the extent of influence of the SSIAPP project on farming activities.

Table 5.1: Impact of SSIAPP's activities on farmers

Attributes	Ashaiman		Okyereko	
	Respondents	Percentage	Respondents	Percentage
Yes (Positive impact)	80	(100)	96	(100)
No (No impact)	0	(0)	0	(0)

Source: Evaluation of SSIAPP Activities (2001), Farm Management, Extension and Farmers' Organisation

100% of respondents in Ashaiman confirmed that SSIAPP activities including training have brought about positive changes in their farming activities. 100% of

respondents in Okyereko also consented to these changes. Yields have generally increased as a result of a combination of factors including better water management, regular and relevant training for farmers, and the credit facilities available from the cooperative society. Current rice yields average 30 bags per acre. Table 5.2 shows the responses of farmers with regards to increase in yields.

Table 5.2: Increase in yields after SSIAPP

Level of increase	0	20%	40%	60%	80%	100%	More than 100%	Total Num. of respondents	Average
ASHAIMAN Number of respondents	0	6	9	26	16	17	7	81	72%
Percentage	(0)	(7)	(11)	(32)	(20)	(21)	(9)		
OKYEREKO Number of respondents	1	11	12	21	32	17	0	94	66%
Percentage	(1)	(12)	(13)	(22)	(34)	(18)	(0)		

Source: Evaluation of SSIAPP Activities (2001), Farm Management, Extension and Farmers' Organisation.

In the period preceding the implementation of the project, most farmers sourced their seeds from the market, financed their farms by themselves or through credit from market mummies, and marketed their crops through these same market mummies to whom they compelled to mortgage the produce from their farms.[1]

The situation has changed. Seeds are sourced mostly through the project facility, farms are financed through input credit from the cooperatives, and while individual marketing of produce continues to exist, there is a predominance of collective marketing, in the case of rice in particular.[2]

Improvement in the farming system is assessed in accordance with the basic framework of area farming system consisting of the five subsystems of land use, water use, means of labour, labour use, and credit management.

5.1.1 Land use

Land use currently is characterized by more planning, better organization and better crop management. While rice, for example, was grown once, only in the main season before the inception of the project, it is presently cropped twice in a year. Other crops like maize and vegetables such as cabbage and cucumber are cropped twice within a season.

[1] Questionnaire (December, 2001), and focus group discussions
[2] ibid

Pre-SSIAPP land use was very low – about 40%. Land preparation took relatively more time as there were very few or no power tillers. The use of the hoe was more predominant.

Effective and efficient use of weedicides have considerably reduced the frequency of in weeding of crops. Under the project, training in land preparation for farmers has improved the use of land. While in Ashaiman, we have 200% - 300% cropping intensity, only 50% of rehabilitated land in Okyereko has been cropped.

Lack of commitment on the part of farmers towards seed development encouraged the use of seeds from previous harvests or seeds brought in by market mummies. This resulted in low yields.

The use of power tillers for land preparation and tractors for ploughing and harrowing for vegetable cropping has intensified the use of the land. Farmers have come to understand the essential need of starting with good seeds and have embraced the seed production technology introduced by the project. In the case of rice, for example, farmers undertake seed multiplication to provide seeds for subsequent planting. In the case of vegetables, farmers have learnt to use certified seeds for good yields.

There is more appropriate use and application of herbicides.

The project period has witnessed significant contribution of the cooperatives to land use by the provision of information on crops to be grown during the season as well as a cropping calendar. Coupled with this is the preparation of individual farmers of Farm Plans as a framework for cropping activities. The plans provide information on:

- area of land to be cropped;
- types of crops to be planted;
- the period for planting;
- type of land preparation and machines needed;
- fertilizers and chemical-types rates of application;
- a budget for all activities;
- harvesting period; and
- the amount of labour required.

5.1.2 Water use

Water use before the inception of the project was very poor. Most water was lost before reaching the farmlands to the extent that the efficiency of water use was less than 30%[3]. The period was characterized by fights and disputes over water.

[3] Focus group discussions with farmers

Farmers were reluctant to pay irrigation service charges because of insufficiency of water and unreliability of water flow. Poor water availability and scheduling resulted in irregular cropping.

The project brought in its wake 60% efficiency in water use[4]. Water flow is regular and takes much less time to get to plots. Wastage was considerably minimized coupled with a considerable improvement in the use of water on the farms by farmers. There has been more planning in water use and farmers are themselves actively involved in the maintenance of irrigation structures from the valve through the laterals. There is an overwhelming satisfaction among farmers with the SSIAPP water management structures as shown in Table 5.3.

Table 5.3: SSIAPP water management

Attributes	Ashaiman		Okyereko	
	Respondents	Percentage	Respondents	Percentage
Yes (improvement)	81	(100)	92	(96)
No (no improvement)	0	(0)	4	(4)

Source: Evaluation of SSIAPP Activities (2001), Farm Management, Extension and Farmers' Organisation.

There is a high level of satisfaction with the distribution of water with the presence of distribution boxes to farms. There are much less disputes and more understanding and cooperation among farmers with respect to water use.

According to the farmers, workshops on water management have helped to encourage more efficient and effective use of water on their farms[5]. Because of the satisfaction of farmers for water distribution, there is a much higher level of payment of irrigation charges with no refusal of payment. Furthermore, the farmers themselves manage funds from these charges.

In a survey evaluating SSIAPP activities as at September 2001, 81 (100%) farmers at Ashaiman responded that SSIAPP had improved water management for farmers while the figure for Okyereko was 92, with 4 disagreeing on the issue.

However, there is still room for improvement in on-farm water management practices.

5.1.3 Means of labour

Basic tools like the hoe continue to be used. In the period prior to the implementation of the project, the source of machinery for land preparation in Ashaiman were private contractors. And the services from these providers had to be paid for in cash.

[4] Focus group discussions with farmers
[5] Focus group discussion

The project has made available power tillers, rotavators, and small tractors for land preparation. There are also two bullocks for carting manure to farms. These machinery are put under the management of the cooperatives. Regular training provided by the project, have produced better operators and machine handlers and the method of tilling has improved.

The farmers from both irrigation sites acknowledge that the provision of machinery under SSIAPP has had a positive impact on their farming activities as evidenced in Table 5.4.

Table 5.4: Impact of machinery on farming activities

Attributes	Ashaiman		Okyereko	
	Respondents	Percentage	Respondents	Percentage
Yes (Positive impact)	80	(100)	96	(100)
No (No impact)	0	(0)	0	(0)

Source: Evaluation of SSIAPP Activities (2001), Farm Management, Extension and Farmers' Organisation.

5.1.4 Labour use

Family labour and hired labour continue to be employed in farm work. The pre-SSIAPP period saw relatively more use of family labour even though hired labour was also used of the farm. Post-SSIAPP continues to exhibit the use of family and hired labour with more emphasis on the latter. Hired labour is particularly used in hoeing, harvesting and drying. Most vegetable growers benefit from the use of "customer labour" during harvest. This is an arrangement, which benefits both the farmer and the buyer of the produce.

It is pertinent to establish that the cooperative initiates the hiring of labour for farmers who are in dire need and yet constrained by cash. It also provides cash to help farmers to pay for labour cost for harvesting. This was not the case before the advent of the project.

Baseline studies show that only farmers in Ashaiman (4.1%) considered labour availability as a factor affecting the start of cropping in the dry season.

5.1.5 Credit system

Market mummies constitute the main source of credit in the pre-SSIAPP period. In a 1998 farming systems survey, 74.2% of the respondents in Ashaiman and 63.2% of those in Okyereko identified lack of capital as the most important single factor that determined the start of the cropping season[6]. These credits were characterized by inadequate levels and untimely availability. Furthermore, there

[6] Report on the SSIAPP Activities Aug 1997 – March 2000, SSIAP Project.

were harsh conditions attached to the loans. Because the credit providers pre-financed the farming activities, farmers had to pledge all their produce to the lenders and were thus unable to store the produce and take advantage of the high prices offered in the period of scarcity (Farm Management, Extension and Farmers' Organisation Section).

The cooperative currently runs a well organized credit system with a reasonable interest rate to generate capital to sustain their operations. Hitherto, farmers exercised very little control in cooperative affairs. The situation is, however, remarkably different with the cooperative more independent of IDA, the latter playing a more facilitating role. The funds are managed by the farmers themselves.

However, some farmers have expressed concern that the interest rate is too high (24.7 % of Ashaiman farmers surveyed said the interest rate was high)[7]. The cooperative society, therefore, regularly undertakes education to explain the need for the present level of interest rates to be maintained to generate capital and increase the revolving fund to ensure availability of inputs. Furthermore, prevailing prices constitute the basis for determining input prices, which are reviewed every season for the ultimate benefit of all the members of the cooperative.

The cooperative has more control now on purchases and leadership intends to source inputs more efficiently and at competitive prices.

Despite the concern on the high interest rates, the level of satisfaction of the input credit scheme is reflected in Table 5.5 below. 100% of the farmers at both locations responded that SSIAPP input credit scheme had had a positive impact on their farming activities.

Table 5.5: Impact of input credit scheme on farming activities

Attributes	Ashaiman		Okyereko	
	Respondents	Percentage	Respondents	Percentage
Yes (Positive impact)	80	(100)	94	(100)
No (No impact)	0	(0)	0	(0)

Source: Evaluation of SSIAPP Activities (2001), Farm Management, Extension and Farmers' Organisation.

The areas of impact and farmers responses is shown in Table 5.6. Increased yields was accepted by the majority of farmers in both Ashaiman and Okyereko as a high impact area.

[7] Questionnaire (December, 2001)

Table 5.6: Impact areas of SSIAPP input credit scheme

Impact Areas	Ashaiman		Okyereko	
	Total number of respondents - 80		Total number of respondents - 94	
	Respondents	Percentage	Respondents	Percentage
Increased yield	67	84	84	89
Increased farm income	59	74	65	69
Made farm operations smooth	47	59	71	76
Others	3	4	4	4

Source: Evaluation of SSIAPP Activities (2001), Farm Management, Extension and Farmers' Organisation.

It is encouraging that the farming input credit scheme has a very high rate of recovery.

5.1.6 Transfer of Technology

Baseline survey results showed that training as a means of transferring technology had never been undertaken at Okyereko. All 68 respondents said they had never been involved in any training before the SSIAPP and demonstrations were seldom carried out. Only 6 (8.8%) of the people claimed to have seen a demonstration at Okyereko (Report on the SSIAPP Activities, Baseline Survey Studies, 1998).

Out of 74 respondents in Ashaiman, only 21 (28.4%) had been involved in training. This training was organized by the Food and Agriculture Organisation (FAO), in which selected farmers were taken through a four-month training in Integrated Pest management (IPM). The rest, 53 (71.6%) said they had not been involved in training before. However, only 8 of the farmers (10.7%) said they had seen a demonstration farm (ibid.)

With the inception of the SSIAPP, the farmers now acknowledge that they have learned some improved farm technology, going through specific training areas and workshops to learn new and more efficient and effective ways of going about their farming activities. 100 % of respondents in both Ashiaman and Okyereko admitted learning improved farming technology under SSIAPP. The type of technology learnt is categorized in Table 5.7.

Table 5.7: Farmer responses on technology acquired under SSIAPP

Technology	Ashaiman		Okyereko	
	Total number of respondents - 79		Total number of respondents - 93	
	Respondents	Percentage	Respondents	Percentage
Land preparation	60	76	88	95
Seed preparation	33	42	76	83
Water management	50	63	63	68
Fertilizer application	52	66	65	70
Soil improvement	20	25	41	44
Others	10	13	10	11

Source: Evaluation of SSIAPP Activities (2001), Farm Management, Extension and Farmers' Organisation.

5.2 *Contributions of sections to project goal and subsequent impact on the farming system*

The impact of SSIAPP on the farming systems and ultimately farmers' incomes, requires an examination of the role and achievements of the component technologies comprising the various sections of the project and their contributions towards the achievement of the overall goal of the project.

5.2.1 Training

The section has:

- strengthened the capacity of GIDA extension officers in the improvement of farming systems;
- improved the project management abilities of major stakeholders including farmers, project managers, leaders of farmers' organization, and lateral leaders; and
- increased the knowledge and skills, as well as improved the attitudes of farmers, leading to the adoption of improved technologies on fields resulting in increased yields.

The figures in Table 5.8 show that much less farmers were trained in Okyereko before the project than in Ashaiman.

Table 5.8: Proportion of farmers trained before inception of project

Training Area	Ashiaman		Okyereko	
	Total number of respondents - 73		Total number of respondents - 90	
	Number of respondents	Percentage	Number of respondents	Percentage
Land Preparation	39	56.5	12	12
Seed Selection	36	52.1	9	11
Farming Process	36	52.1	10	13
Record Keeping	37	53.6	4	5

Source: Questionnaire (December, 2001)

The SSIAPP placed immense emphasis on training. Training programs in basic store-keeping and basic accounting for the executives of the farmers' cooperatives have built up their capacities for better record keeping and more effective management of the resources of the cooperatives. Better management of the cooperative has resulted in high responsiveness to farmers' input needs to achieve high productivity.

Another impact of training is the active involvement of farmers in the project management on the model schemes. With the training in input credit management, farm inputs are supplied on time and credit repayment is high. Furthermore, farmers appear more conscious and in attends meetings regularly.

For the period of the SSIAPP, 65 farmers in Ashaiman, 91.5% of respondents have benefited from training. Areas of training listed by farmers include:

- Credit Management
- Crop Cultivation
- Farm Management
- Water Management
- Fertilizer and Chemical Application
- Land Irrigation
- Land Preparation
- Integrated Pest Management
- Crop Management
- Record Keeping
- Marketing
- Leadership
- Crop Production Processes
- Machine Operations
- Cooperative Farming and Management
- Maintenance of Irrigation Facilities
- Extension Services

64 farmers out of 66 respondents or 97% on the Ashaiman site and 87 out of 90 respondents (97%) in Okyereko agreed that training during the SSIAPP had been of immense benefit to them. Farmers listed the following as areas they have benefited from.

Ability to cultivate all year
Easy and timely detection of diseases and their management
Better application of fertilizers and other chemicals
Better cultivation/farming practices
Better farm management
Better record keeping
Better skills in rice and vegetable production
Better field maintenance
Better monitoring of crop cultivation and production
Changes in attitudes
Better utilization and operation of equipment and machinery
Increase in yield
Good seed selection and multiplication
Better formation and management of cooperatives
Efficiency in water use
Better cropping techniques

Source: Questionnaire (December, 2001)

Only 4 farmers out of 62 respondents in Ashaiman (6.5%) and 7 out of 90 (7%) in Okyereko, have experienced at least one obstacle to applying knowledge and skills acquired from training, listing such obstacles as too much vegetative growth, scarce labour and unwillingness to change.

Indeed the Project has facilitated the construction of a Training Centre.

5.2.2 Water Management

The Water Management Section has contributed to the improvement in the farming systems through:

- the monitoring of water level in the reservoir;
- the improvement of the water delivery system according to cropping schedule;
- the improvement of more efficient water utilization technologies;
- the increase in responsibilities and business sharing of operations and maintenance;
- the creation of a feedback system of technical information; and
- the improvement of proper utilization and payment of irrigation service charges.

The irrigation facility is characterized by good structures such as canals, laterals, division boxes, roads and drainage after the rehabilitation. Water wastage has been considerably minimized due to these facilities and better monitoring on farmers fields. The reservoir stores adequate water due to much better water management.

Proper water-use technology has led to increase in yields and relatively impressive payments of irrigation service charges on the whole, even though, there have been situations where the collection has been described as not encouraging and with high default. These charges are collected by the cooperative using lateral leaders and sanctions have been introduced for defaulters.

On the whole, there has been effective monitoring of irrigation facilities, effective data collection, creation of awareness to pay irrigation service charge (ISC) and the farmers have realized the need to use water efficiently. All the respondents in Okyereko, however, responded that the irrigation service charges were too high.

There is now continuous cropping by farmers guided by their farm plans, and with the assurance of water reliability.

Tables 5.9, 5.10, 5.11, and 5.12 show results of farmers' evaluation of the management of the irrigation facilities.

Table 5.9: Evaluation of irrigation management

Attributes	Ashaiman		Okyereko	
	Number of Respondents	Percentage	Numbers of Respondents	Percentage
Excellent	1	1.4	0	0
Very good	3	4.1	11	12.2
Good	51	69.9	74	82.2
Average	13	17.8	4	4.4
Below average	2	2.7	1	1.1
No response	3	4.1		

Source: Questionnaire (December, 2001)

The majority of respondents in both project locations confirmed that the irrigation management was good (69.9% in Ashaiman and 82.2% in Okyereko). Only 2.7% of farmers in Ashaiman and 1.1% of farmers at Okyereko thought that the irrigation management was below average.

Table 5.10: Evaluation of water availability

Attributes	Ashaiman		Okyereko	
	Number of Respondents	Percentage	Number of Respondents	Percentage
Excellent	0	0	0	0
Very good	5	6.8	20	22.2
Good	55	75.3	67	74.4
Average	10	13.7	1	1.1
Below average	2	2.7	2	2.2
No response	1	1.4		

Source: Questionnaire (December, 2001)

An appreciable percentage of 75% in Ashaiman and 74.4% in Okyereko respectively believed water availability was good, indeed much better than pre-SSIAPP period. A focus group discussion with the farmers during the evaluation exercise confirmed water availability as satisfactory. In the baseline study, 52% and 47% of respondents in Ashaiman and Okyereko respectively agreed that water availability affected the start of cropping in the dry season.

Table 5.11: Evaluation of water scheduling

Attributes	Ashaiman		Okyereko	
	Number of Respondents	Percentage	Number of Respondents	Percentage
Excellent	0	0	0	0
Very good	5	6.8	16	17.8
Good	53	72.6	64	71.1
Average	9	12.3	4	4.4
Below average	4	5.5	6	6.7
No response	2	2.7		

Source: Questionnaire (December, 2001)

72.6% of respondents in Ashaiman and 71.1% of those at Okyereko believe that water scheduling is good. Distribution has been efficient and satisfactory as it is based on scheduling.

Table 5.12: Evaluation of irrigation system maintenance

Attributes	Ashaiman		Okyereko	
	Number of Respondents	Percentage	Number of Respondents	Percentage
Excellent	0	0	0	0
Very good	5	6.8	14	15.6
Good	52	71.2	74	82.2
Average	10	13.7	1	1.1
Below average	3	4.1	1	1.1
No response	3	4.1		

Source: Questionnaire (December, 2001)

A majority of farmers in both locations (71.2% of farmers in Ashaiman and 82.2% of farmers in Okyereko) were impressed with the maintenance of the irrigation system, which they evaluated as good. The farmers are actively involved in the maintenance of the irrigation system. It is now the responsibility of the cooperative to maintain the entire system, except the head works. Through communal labour, weeding, desilting and block works are carried out on the main canal, drain, lateral roads and valve gates. For example, in Ashaiman, communal labour was carried out 10 times in 1999 and 12 times in 2000. By May, 2001 it had been carried out 5 times in that year[8].

[8] Internal Evaluation of Activities on Ashaiman Irrigation Scheme (GIDA and JICA, June 2001)

5.2.3 Farm Management, Extension and Farmers' Organisation

Through the activities of this section:

- crop yields have increased on the average by 72% in Ashaiman and 66% in Okyereko[9];
- cropping intensities have improved;
- farmers prepare their own farm plans, do their own record keeping, and control their own budgets;
- an efficient farm input credit system has been established;
- a support system for the women farmers and the formation of farming groups have been achieved.

The impact of the activities of the Farm Management, Extension and Farmers' Organisation is evident in the farmers ability to:

- regularly prepare their farm plans;
- effectively operate the farm input credit scheme;
- strengthen the cooperative societies to make them more functional and improve cooperative membership relations;
- form such groups as the Export Farmers Group; and
- reinforce business activities through the farmers' own purchase of inputs and collective use of machinery and other equipment.

A notable result of sectional activities is the linkages established between farmers, farmers groups and other related organisations like Dawhenya Cooperative Society, JICA, and the Department of Cooperatives.

Table 5.13: Evaluation of support services- Cooperatism

Attributes	Ashaiman		Okyereko	
	Number of Respondents	Percentage	Number of Respondents	Percentage
Very good	10	13.7	17	18.9
Good	46	63.0	65	72.2
Average	10	13.7	8	8.9
Below average	6	8.2	0	0
No response	1	1.4		

Source: Questionnaire (December, 2001)

The Baseline study listed a number of constraints for the cooperatives as:

- lack of financial support;
- lack of strong leadership;
- poor attitude of members;

[9] Questionnaire (January, 2002)

- lack of training for executives;
- poor knowledge of the cooperative concept;
- lack of full time staff;
- lack of office facilities; and
- lack of knowledge about administration procedures.

All these constraints are currently non-existent. However, a few respondents in Okyereko were of the opinion that the cooperative there needed to be autonomous to be able to carry out its work effectively. It is believed that the presence of the local chief on the executive committee of the cooperative as its chairman is quite intimidating. This prevented other members from voicing out their opinions freely.

Cooperatism, however, has been strengthened through a series of training and workshops for the executives, lateral canal leaders, and members covering a range of topics. Training have covered such areas as principles of cooperative practice, basic book keeping and farm records, and financial management. Credit payment for all the crops have been 100% unlike pre-SSIAPP period whose balances are still outstanding.

Table 5.14: Evaluation of support services- Extension Services

Attributes	Ashaiman		Okyereko	
	Number of Respondents	Percentage	Number of Respondents	Percentage
Very good	2	2.7	21	12.2
Good	30	41.1	61	67.7
Average	12	16.4	8	8.9
Below average	28	38.4		
No response	1	1.4		

Source: Questionnaire (December, 2001)

Farmers in Ashaiman were relatively unimpressed with extension services provided (Table 5.14). While 67.7% of respondents at Okyereko thought extension services were good, 54.8% of respondents at Ashaiman evaluated the delivery of such services as average and below average.

Table 5.15: Evaluation of support services- Credit facilities

Attributes	Ashaiman		Okyereko	
	Number of Respondents	Percentage	Number of Respondents	Percentage
Very good	2	2.7	11	12.2
Good	50	68.5	63	69.9
Average	4	5.5	3	3.3
Below average	14	19.2	13	14.4
No response	3	4.1	-	-

Source: Questionnaire (December, 2001)

Despite the opinion of some farmers that interest rates were high, respondents at both locations (68.5% at Ashaiman and 69.9% at Okyereko) believe credit facilities are good (Table 5:15).

Table 5.16: Evaluation of support services- Farm inputs

Attributes	Ashaiman		Okyereko	
	Number of Respondents	Percentage	Number of Respondents	Percentage
Very good	4	5.5	12	13.3
Good	57	78.1	59	65.6
Average	8	11.0	14	15.6
Below average	3	4.1	5	5.5
No response	1	1.4	-	-

Source: Questionnaire (December, 2001)

Most farmers 83.6% (Ashaiman) and 78.9% (Okyereko) rated the availability of farm inputs as good to very good (Table 5.16). A great percentage of those who rated this facility as average did so on the basis of what they considered to be the high rate of interest charged on the inputs.

Farmers appear more focused and market oriented. They have their records of production costs in relation to profits and their socio-economic life is changing. Generally, cooperative members are able to prepare crop budgets, farm plans, operation and maintenance schedules and use input distribution forms.

5.2.4 Agricultural Machinery

The Agricultural Machinery Section has achieved considerable impact on the farming system. Impact results include:

- improved land preparation through tilling and leveling, provision of leveling board and floater improvement;
- improved harvesting of rice through the development and provision of sickles, threshers and winnowing machines;
- improved operation and management of machinery.

The result is better land preparation leading to increased yields. Farmers now acknowledge the need to have level fields before planting, and practice row planting to enable the use of a rotary weeder. Furthermore, rice winnowing is carried out using a winnowing machine.

Farmers have been trained in the efficient use of machines. Training has covered powertiller operations, bullock operations, and tractor operations.

Adaptable farm machinery like winnowing machines and bullocks, have been developed to encourage machinery integration in farming practices.

The skills acquired in the use of machines have resulted in an improvement in land preparation and post-harvest processes. Table 5.17 shows a considerable level of appreciation for mechanized land preparation though the cost involved is high.

The percentage of farmers in Ashaiman employing mechanised land preparation rose from 78.1% to 93.1% after the introduction of the project while that for manual land preparation decreased from 21.9% to 6.9% with the introduction of the SSIAPP. A similar trend could be said for Okyereko, where the percentage of farmers employing mechanized land preparation rose from 61%, before the project, to 96% after the SSIAPP.

Table 5.17: Land preparation methods

	Pre-SSIAPP		Post-SSIAPP	
	Ashaiman	Okyereko	Ashaiman	Okyereko
Manual	21.9%	39%	6.9%	4%
Mechanised	78.1%	61%	93.1%	96%

Source: Questionnaire (December, 2001)

Farmers now insist on having a level field before planting. Row planting is practiced to enable the use of a rotary weeder.

5.2.5 Cultivation

The section has encouraged farmers to grow crops such as okra, cassava and tomatoes on the banks of their farms. However, farmers do not strictly adhere to the cropping pattern drawn at the beginning of each cropping season. There is still much to do in the area of weed control.

Seed rates of rice in direct broadcast dropped from an average of 260 kg in pre-SSIAPP period to 70-80kg per hectare during the project period. Rates for transplanting have dropped from 120kg to about 40-45 kg per hectare. Good

Vegetables pest and disease control has been enhanced by the use of neem extract and rotation of crops as well as the use of organic matter such as compost and chicken manure to reduce the cost of production.

The section through its activities has facilitated the development of good quality seed screening techniques. However, this has been mainly in the case of rice. Weeds have been identified and catalogued and appropriate fertilization methods developed.

The trend for seed sources has shifted from market women, who were the main source of credit for inputs, and previous harvests during the pre-SSIAPP period to the farmers' cooperatives, with the implementation of the project. Table 5.18 shows the percentages of farmers sourcing seeds from the various sources during the pre-SSIAPP and SSIAPP periods.

Thus farmers now depend on the project for their seed inputs than before the SSIAPP.

Table 5.18: Sources of seed – percentage of farmers

Attributes	Pre-SSIAPP		Post-SSIAPP	
	Ashaiman	Okyereko	Ashaiman	Okyereko
Market women/Market	22.1%	37%	4.2%	5%
Previous harvest/farmers	64.8%	31%	39.7%	4%
GIDA/Cooperative	0	10%	45.4%	84%
Seed company	4.2%	22%	8.3%	6%
Other				

Source: Questionnaire (December, 2001)

Methods of harvesting continue to remain manual for farmers in both project sites. The trend is the same for post harvest activities. More than 80% of farmers harvest their crops through manual means with relatively little or no post harvest activities.

5.3 Improvement in farmers income

Despite concerns raised by farmers with regards to small farm sizes, high interest rates, low level of micro credit finance, and other personal problems like accommodation, they do acknowledge a significant increase in incomes over the period that the project has been implemented. Farmers in Ashaiman, for instance, site an example in which the improvement in income levels has enabled most farmers pay back a poverty alleviation fund (PAF) loan contracted from the Tema Municipal Assembly before the inception of the project.[10] Furthermore, they consider it very important that their source of income has been regularized since they can now attest to a regular source of employment from a more stable and regular cropping schedule.

The income obtained from farming has provided them the means to pay school fees, buy clothing, radios and other possessions, food and means of transport like bicycles.[11] Farmers admit to a change in attitude from idling and drinking.

[10] Focus group discussions
[11] Questionnaire (December, 2001) and focus group discussions

Table 5.19: Increase in farm income

Level of increase	0	20%	40%	60%	80%	100%	More than 100%	Total Num. of respondents	Average
ASHAIMAN Number of respondents	0	8	12	30	18	7	3	78	63%
Percentage	(0)	(10)	(15)	(38)	(23)	(9)	(4)		
OKYEREKO Number of respondents	3	7	20	20	23	15	2	90	64%
Percentage	(3)	(8)	(22)	(22)	(26)	(17)	(2)		

Source: Evaluation of SSIAPP Activities (2001), Farm Management Extension and Farmers' Organisation

Table 5.19 is the result of a survey to evaluate SSIAPP activities. Farmers incomes have increased by an average of 63% in Ashaiman and 64% in Okyereko according to an impact survey conducted by the Farm Management, Extension and Farmers' Organisation section in September 2001.

The table shows that, on the average, farmers accept that the project has achieved a significant level of increase in income. Most farmers, 76% at Ashaiman and 70% at Okyereko believe their income level has been increased by between 40% and 80%. 17% and 9% of respondents at Okyereko and Ashaiman respectively confirmed that their income had increased by 100% during the project period.

Relatively more farmers in Okyereko (81.1%) thought there had been some level of improvement in their standard of living as against 64.4% of farmers in Ashaiman (Table 5.20).

Table 5.20: Response to status of standard of living after inception of SSIAPP

Attributes	**Ashiaman**		**Okyereko**	
	Number of Respondents	Percentage	Number of Respondents	Percentage
Can't tell	1	1.4	4	4.4
Worse	2	2.7	4	4.4
The same	20	27.4	9	10
Just better	31	42.5	36	40
Much better	16	21.9	37	41.1

Source: Questionnaire (December, 2001)

A variety of causes, indications and comments were assigned for the responses to this question about living standards. They have been produced verbatim. They include:

- better yield, higher income;
- assistance provided farmers on a regular basis by cooperatives;

- continuous farming;
- availability, timeliness and reliability of input credit;
- better living but problem with marketing;
- happiness with farming operations;
- high interest rate on credit and loans take all the profit;
- higher income, better job satisfaction;
- small acreages, high interests;
- things have not improved;
- small plot sizes, same yield;
- timely production, better yield;
- no cash receipts for sales to cooperatives;
- living is still hard;

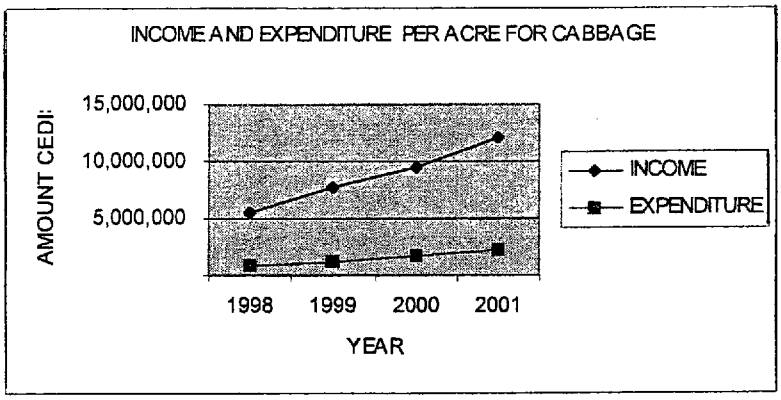
It is notable that 20 farmers (27.4%) at Ashaiman and 9 farmers (10%) at Okyereko believed that the standard of living had not changed appreciably with the inception of the project. 2 farmers at Ashaiman and 4 farmers at Okyereko though they were worse off during the project period.

Training activities have led to the adoption of new technologies for increased yields and ultimately higher net profits for farmers (Table 5.1). The introduction of the Farmers Bank and the training offered in the Bank's management have reduced the reliance on loans with high interest rates from market women.

Yields of rice have increased from 3-4 tonnes per hectare to 5-6 tonnes per hecatare on the average. The cost of production of both rice and vegetables has been maintained and yields have increased due to better management and the availability of good varieties with the result of a higher profit margin.

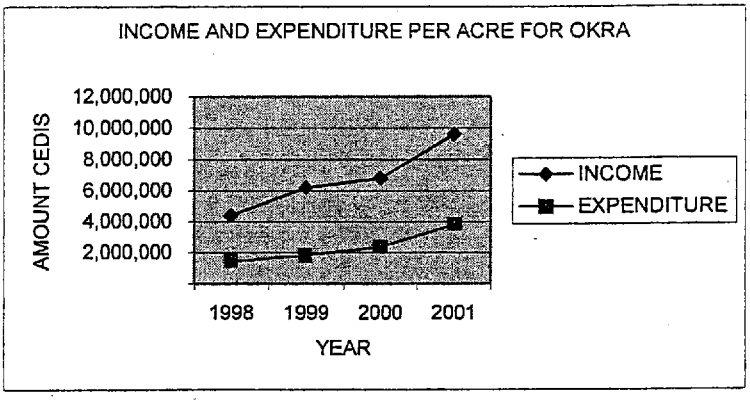
Figures 5.1 to 5.4 below show the progression of expenditure against income for various selected crops – cabbage, rice, okra, and maize. The graphs illustrate the increase in incomes and expenditure over the period 1998 to 2001, the project period.

Figure 5.1:



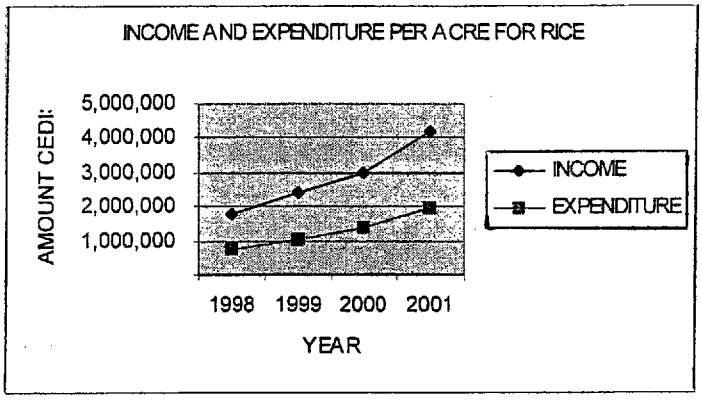
Source: Farmers Cooperative (Ashaiman)

Figure 5.2:



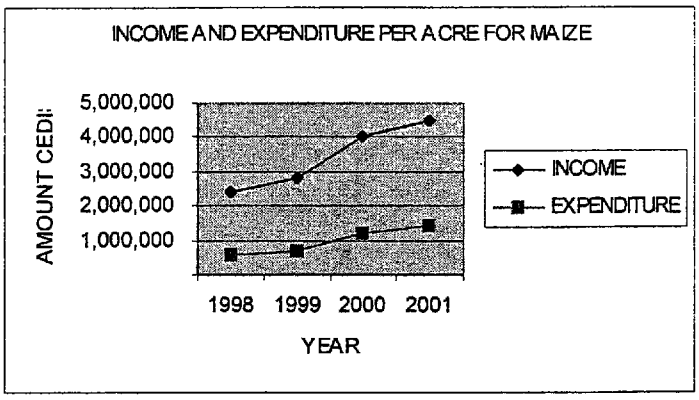
Source: Farmers Cooperative (Ashaiman)

Figure 5.3:



Source: Farmers Cooperative (Ashaiman)

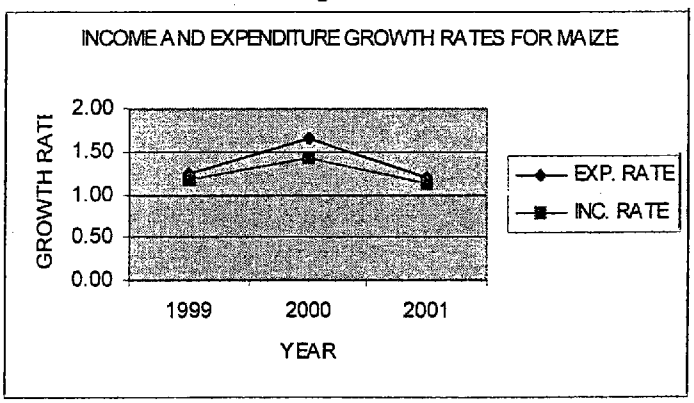
Figure 5.4:



Source: Farmers Cooperative (Ashaiman)

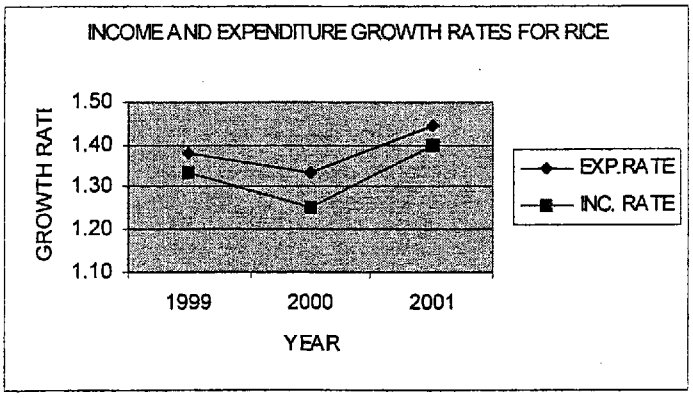
Figures 5.5 to 5.8 depict the growth rates for income and expenditure for the respective crops.

Figure 5.5



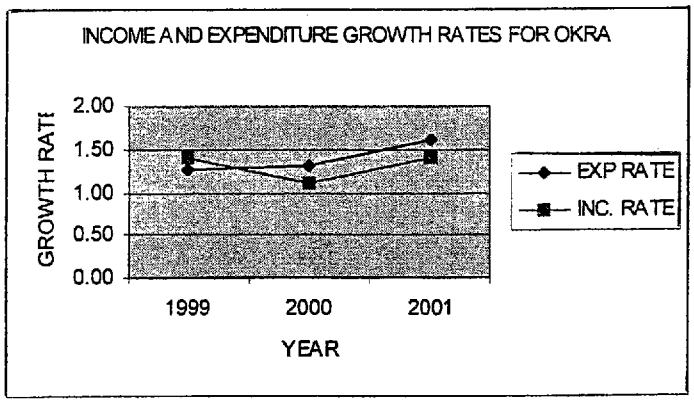
Source: Farmers Cooperative (Ashaiman)

Figure 5.6



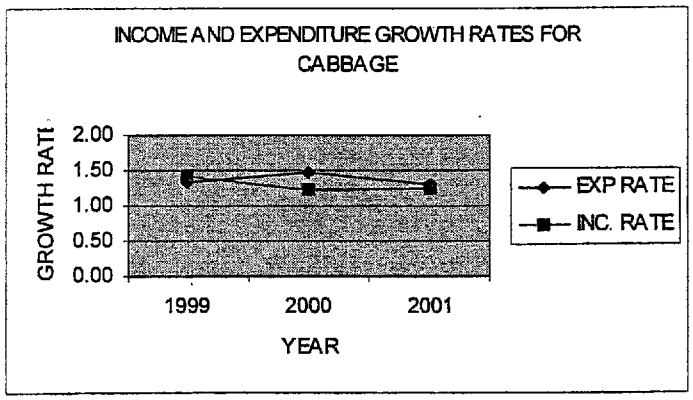
Source: Farmers Cooperative (Ashaiman)

Figure 5.7



Source: Farmers Cooperative (Ashaiman)

Figure 5.8

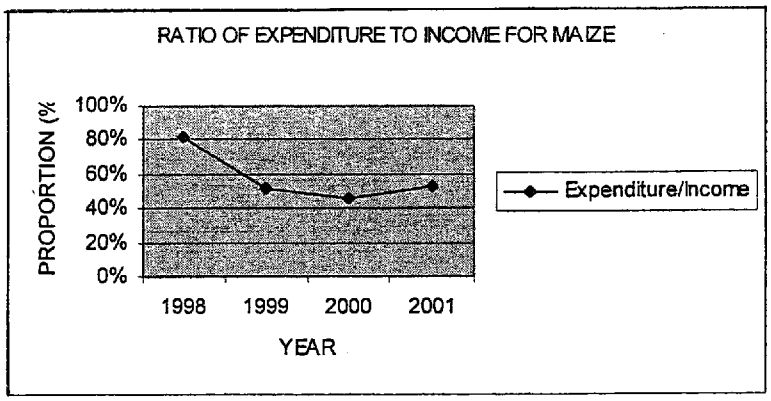


Source: Farmers Cooperative (Ashaiman)

32

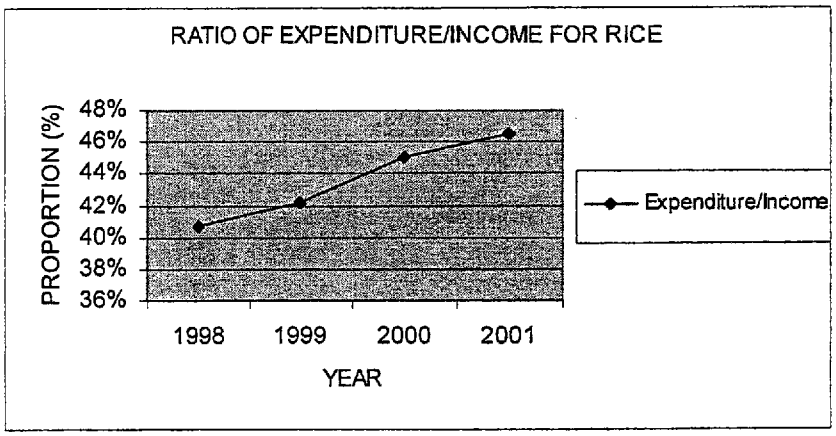
Figures 5.9 to 5.12 show the ratio of expenditure to income for the selected crops. These show an increasing trend of cost of production and calls for measures to increase income at a much faster rate than expenditure.

Figure 5.9



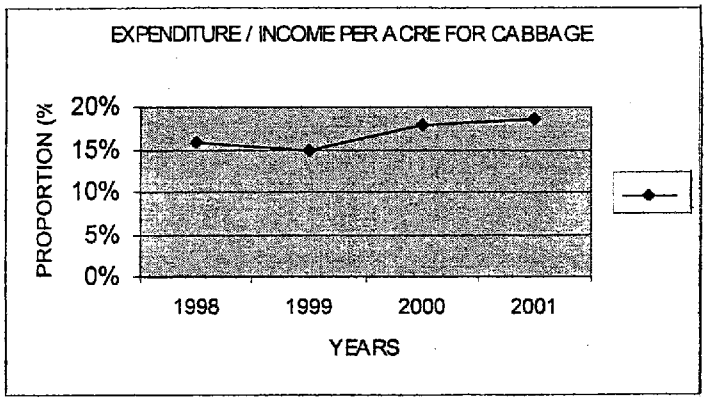
Source: Farmers Cooperative (Ashaiman)

Figure 5.10



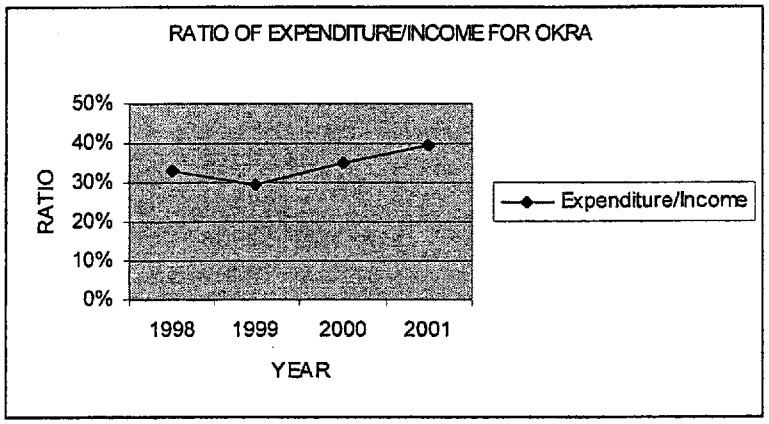
Source: Farmers Cooperative (Ashaiman)

Figure 5.11



Source: Farmers Cooperative (Ashaiman)

Figure 5.12



Source: Farmers Cooperative (Ashaiman)

We observe that the ratio of expenditure to income in all cases except for maize, had a rising trend from 1999. Significantly, there was a decrease in the ratio for all the crops with the exception of rice from 1998 to 1999, implying an increase in net income over the period.

Table 5.21: Selected impact areas of SSIAP for farmers

Impact Areas	Number of farmers (%) Responding YES (positive impact)			
	Ashaiman		Okyereko	
	Number of Respondents	Percentage	Number of Respondents	Percentage
Shelter	18	24.7	25	27.8
Food	21	28.8	82	91.1
Material wealth	11	15.1	63	69.9
Health	22	30.1	67	74.4
Savings	4	5.5	33	36.7
Children's education (fees)	21	28.8	75	83.3
Entertainment	15	20.5	20	22.2

Source: Questionnaire (December, 2001)

With regards to the selected impact areas, items such as food, health and children's education (fees) stand out as areas of relatively higher impact. 28.8%, 30.1%, and 28.8% of respondents at Ashaiman respectively acknowledged some impact in the areas of food, health and fee. The corresponding figures for Okyereko were 91.1%, 74.4%, and 83.3% respectively.

6. Issues Arising From The Study

Despite the farmers' acknowledgement of an improvement in the farming system, and the corresponding increase in their income level, several issues were mentioned as requiring consideration and attention. These include:

- accommodation problems - farmers are considering the concept of a settlement farm;
- marketing problems (particularly for rice) as a result of the collective selling strategy: currently, there are tonnes of rice in stock waiting to be sold;
- high rate of interest on input credit and the "short" payment period of six months;
- encroachment on project lands (particularly in the case of Ashaiman);
- land sizes which are considered relatively small to generate considerable income;
- lack of or low level of cash credit;
- problems of soil salinity;
- low rate of follow-up visits from extension officers;
- irregular training for farmers;
- low level of democracy in cooperatives;

Other problems have emerged in the course of project implementation that also require prompt and effective response. They include:

- poor commitment on the part of the Government of Ghana to release matching funds for running the project and furnishing the Training Centre;
- poor incentives such as allowances for Ghanaian counterpart staff;
- improper crop production planning in Ashaiman;
- poor dissemination of information arising from sectional activities;
- lower than expected commitment to cropping activities on the part of Okyereko farmers;
- poor land leveling and irrigation infrastructure despite the rehabilitation;
- difficulty with convincing farmers to pay fees for machinery usage despite the training;
- low price of paddy;
- relatively high cost of production;
- frequency of changes in experts and organizational direction; and
- change of research topics which have not come to a conclusion.

7. Sustainability of the Project

7.1 Capacity building

Since 1997, various levels of personnel have been trained in Japan under the project. Trained personnel included, Directors and Deputy Directors, Sectional Heads, Agricultural Extension Officers, Unit Heads, Agricultural Economists, Engineers, Agronomists, and Cooperative Officers.

The duration of courses have ranged from 2 weeks to 9 months. Fields of training that have been covered include:

- Irrigation Agriculture;
- Irrigation and Drainage;
- Vegetable Cultivation Technology for Extenson;
- Agricultural Cooperative Management;
- Agricultural Machinery Management;
- Rice Cultivation;
- Farm Management;
- Agricultural Cooperatives and Marketing;
- Irrigation, Drainage and Rural Development;
- Irrigation, Drainage and Water Management; and
- The Role of Agricultural Cooperatives in Activation of Rural Economy.

There have been training in other countries like Egypt and Indonesia. Considerable success (80%) has been achieved in each area of training extension officers on irrigation schemes, training for staff of farmers' organizations, and training for farmers. Numerous local courses have been organized to achieve this level of success and a total of eight hundred and one (801) participants have been trained from September 2000 to December, 2001,

Participants have acknowledged the high applicability of the knowledge acquired to their work and the relevance of the training towards project sustainability.

7.2 Special provisions and features

The SSIAPP had as it target group, farmers at Ashaiman and Okyereko. The target population is 94 and 131 farmers in Ashaiman and Okyereko respectively.

The project is characterized by some provisions that distinguish it from other similar projects.

- there is an emphasis on the formation of cooperatives among farmers;

- a farmer participatory credit system has been established;
- there is intensive education and training to strengthen the capacity of the cooperatives; and
- there is reliable and easy access to improved technologies and materials for crop production.

Furthermore, the project has certain other special features to ensure sustainability. These features include:

- improved communication among stakeholders;
- integrated activities of farmers cooperatives;
- training of farmers and government staff together;
- a better appreciation and understanding on the part of farmers of their roles and responsibilities;
- institutionalization of farm plans and budgets for a collective cropping programme; and
- the regularization of frequent interaction among farmers and between farmers and project staff.

7.3 Continued delivery of services

A study of the project activities shows that the volume and stability of the services, and the efficiency of service delivery are good. The quality of services, the satisfaction of beneficiaries, and the distribution of benefits among the farmers are also good.

7.4 Maintenance of physical infrastructure

The condition of physical infrastructure, plant and equipment, and the adequacy of maintenance procedures are considered good. The efficiency of cost recovery and adequacy of operating budget are poor. However, there is firm evidence of beneficiary involvement in maintenance procedures.

7.5 Long-term institutional capacity

Analyses of questionnaires administered show that the:

- capacity and mandate of the principal operating agency are considered relatively low;
- stability of staff and budget of operating agency were poor;
- adequacy of interagency coordination was generally described as average;
- Adequacy of coordination with community organizations and beneficiaries are good; and
- Flexibility and capacity to adopt project to changing circumstances are considered good.

7.6 Support from key stakeholders

The stability and strength of support from international agencies are good; however, such support from the national government as well as the local government is poor. The stability and strength of support at the community level is good, and the ability of the project to avoid becoming politically controversial is also quite good.

7.7 Disparity in development

It is apparent that there is a disparity in the development of the two models, at Ashaiman and Okyereko.

The sustainability for the former has been rated as high to very high while that for the latter is considered low to fairly high. The reasons given for this disparity are listed as:

- the difference in the irrigation system inclusive of the irrigation service charge – charges differ in both locations and are less in Ashaiman;
- the presence of more educated farmers in Ashaiman, making them more capable to assimilate and apply any innovation;
- the relatively low capacity and lack of democracy among the farmers cooperative at Okyereko;
- the manifestation of initiative and drive on the part of the Ashaiman farmers;
- there is more cropping intensity in Ashaiman, 200-300% while only 50% of the rehabilitated land is cropped at Okyereko;
- of the target population size, 100% in Ashaiman has access to the project services and inputs while in the case of Okyereko, it is about 70%;
- the proportion of the target population that has received particular services and input so far is 100% for Ashaiman and 75% for Okyereko.
- the proportion of adopting population that used the project services and inputs exactly as expected or instructed is 50-90% for Ashaiman and 45-50% for Okyereko;

Evidence exists that the farmers are aware of the actual and potential benefits of the project. They do also recognize that these benefits will not fully materialize unless the facility is well maintained. However, for the purposes of sustainability, the farmers need to be brought up to understand that organizational and financial capabilities are required to keep a firm commitment to maintain the facility over time and that they should not expect to receive resources for rehabilitating the facility.

It is encouraging to learn of the reasonable level of involvement of farmers in operations and maintenance activities.

The issue of concern is the extent to which farmers are willing to invest some of their own resources and to pay back a reasonable portion of the capital costs (at low interest and over a long period of time, if necessary). Also of concern is the capability of the cooperatives to mobilize resources, allocate benefits and duties, and resolve conflicts.

8. Conclusion and Recommendations

8.1 Conclusions

There is overwhelming acceptance that despite the concerns raised and problems being encountered, there has been considerable and significant improvement in the farming system compared to the situation before the inception of the project. Additionally, this improvement has resulted in better yields and, therefore, higher incomes.

Activities carried out by the various sections have introduced new and better practices into the farming system and these have been well assimilated by the farmers. The farmers acknowledge the relevance and applicability of these practices and processes. The project has built considerable capacity in the project staff, farmers and cooperative officers, as well as extension officers to help sustain it.

An evaluation of the satisfaction level of farmers at both sites show a high level of satisfaction of the project. Seventy-five (75) respondents (83.3%) in Okyereko and 40 respondents (54.8%) in Ashaiman said they were highly satisfied with the project. 30 respondents (41.1%) and 15 respondents (16.7%) in Ashainman and Okyereko, respectively, ranked their level of satisfaction of the project as average. Two (2) farmers in Ashaiman declared low satisfaction for the project.

It is also remarkable that, in Ashaiman, for example, 13 farmers who said their standard of living had not changed, still ranked as high, their level of satisfaction with the project. Still interesting is the ranking by two (2) farmers who described their standard of living as having been made worse and yet were highly satisfied with the project. Sixteen (16) farmers who said their standard of living was just better, also ranked their satisfaction level for the project as high.

Sustainable agriculture on a scheme such as the SSIAPP means:

- continuous availability of water;
- availability of credit;
- ability of the land to support agriculture; and
- availability and affordability of agricultural equipment.

Evidence on the ground suggest that by and large these conditions are being met to an extent. In view of concerns expressed by all stakeholders, there is still room for improvement to enable the gains achieved to be consolidated and to ensure the future sustainability of the project.

8.2 Recommendations

The following recommendations are made based on the concerns raised, an analysis of focus group discussions with farmers and questionnaires administered to farmers, sectional heads, and representatives of project implementers.

- The project period should be extended to allow the gains made during the project implementation to be consolidated and to prepare the ground for project sustainability;
- Provision should be made for increased extension services to reduce the gap between research staff and farmers;
- Changes in research topics that have not come to a conclusion should not be encouraged;
- More training should be regularly conducted for farmers;
- Farmers should be encouraged to visit other project sites as part of their training;
- The cooperatives should educate farmers more on the operations of such groupings to make them more receptive to strategies;
- There is the need to develop a realistic irrigation service charge that should be paid by all farmers to ensure project sustainability;
- Farmers should be taught the need to minimise waste in all operations in order to reduce the cost of production;
- The cooperatives should improve the capabilities of their marketing sections to effectively market their produce and create public awareness for their activities;
- There is the need to establish standards for crops; Export transactions should have agreements/contracts;
- There is the need for the Government of Ghana to provide on schedule her counterpart funding as well as funds to furnish the Training Centre;
- GIDA should also allocate some budget towards the furnishing of the Training Centre;
- GIDA should incorporate in its budget an element of project allowance to be paid to the project staff as incentive, which must have clear basis;
- The irrigation infrastructure should be rehabilitated where necessary;
- There should be adequate control of the use of chemicals on the farms;
- Proper drainage systems should be instituted to avert salinity build up;
- The development of locally made and locally maintainable equipment should be maintained;
- The cooperative societies should be strengthened to impose sanctions on offenders where applicable;
- The possibility of increasing land sizes should be considered in order to increase the income levels of farmers but without sacrificing productivity;
- Training should be extended to all farmers and foreign training could also be extended to farmers on a limited scale;

- Participants of training programmes should be encouraged to share their knowledge with other farmers;
- The issue of scheme manager should be settled as soon as possible;
- The possibility of sourcing micro-credit facility from providers should be considered since the cooperatives can independently manage such transactions without the intervention of GIDA; and
- The issue of accommodation for farmers on the non-irrigable side of the project site could be looked at and discussed.

Appendix 1: Questionnaire for Farmers

MANAGEMENT DEVELOPMENT AND PRODUCTIVITY INSTITUTE (MDPI)

QUESTIONNAIRE FOR THE SURVEY OF BENEFICIARY FARMERS

A

1.0 Location of farm

2.0 No. of years in farming on project site.

3.0 Gender M ☐ F ☐

4.0 Age group Below 30 ☐ 30 - 39 ☐ 40 - 49 ☐ 50 - 59 ☐ Above 60 ☐

5.0 How many dependants do you have?

6.0 What crops were you growing before the project?

	Crop	Total Area cropped	Method of preparing land	Land preparation cost per acre
1				
2				
3				
4				

7.0 How did you get seed?.....

8.0 How did you sow?

1) Crop 1.....

2) Crop 2.....

3) Crop 3.....

4) Crop 4.....

1

Crop		Land preparation cost per acre	Cost of cultivation per acre	Method of cultivation
A				
B				
C				
D				

Crop/ Area	Method of Harvesting	Total cost of harvesting	Cost of harvesting per acre	Total yield (bags)	Yield per acre
A					
B					
C					
D					

9.0 Did you carry out any post-harvest processes?.....

If YES what was it?.....

.....

10.0 How did you market the produce?.....

.....

11.0 What were the selling prices per bag for the various crops?.....

Crop 1.....

Crop 2 .....

Crop 3 .....

Crop 4 .....

2

12.0 What was your expenditure per acre on the following?

Activity	Crop 1	Crop 2	Crop 3	Crop 4
Land preparation				
Seed,				
Sowing				
Cultivation				
Fertilizer				
Fertilizer application				
Harvesting				
Processing				
Marketing				

13 How did you finance your farming business?.....

.....

.....

14.0 Have you had any training in farming organisation:

- Land preparation
- Seed selection
- Farming process
- Records keeping

3

B

AFTER BENEFITTING FROM THE SIAPP PROJECT

1. What is your acreage now?

Crop		Total Area cropped	Method of preparing land	Land preparation cost per acre
A				
B				
C				
D				

2. How do you get your seed.....

3. What is the cost per acre?.....

4. How do you sow?
   Crop 1.....
   Crop 2.....
   Crop 3.....
   Crop 4.....

5. What does it cost per acre?.....

6. How do you cultivate?
   Crop 1.....
   Crop 2.....
   Crop 3.....
   Crop 4.....

7. What does it cost?.....

8. How do you harvest the various crops?

   Crop 1.....
   Crop 2.....
   Crop 3.....
   Crop 4.....

4

9. What does it cost per acre?.....

Crop 1.....

Crop 2.....

Crop 3.....

Crop 4.....

10 What is the yield (bags per acre)?.....

Crop 1.....

Crop 2.....

Crop 3.....

Crop 4.....

11 Do you carry out any post-harvest processes?.....

If YES what for the crops

Crop 1.....

Crop 2.....

Crop 3.....

Crop 4.....

12 How do you market the produce?.....

13 What are the selling prices per bag?

Crop 1.....

Crop 2.....

Crop 3.....

Crop 4.....

14 What is your present expenditure per acre on

Activity	Crop 1	Crop 2	Crop 3	Crop 4
Land preparation				
Seed,				
Sowing				
Cultivation				
Fertilizer				
Fertilizer application				
Harvesting				
Processing				
Marketing				

15 How do you finance your farming business?.....

16 How do you describe your standard of living **now** as compared with your standard of living **before** benefiting from the project.

Worse ☐
The same ☐
Just better ☐
Much better ☐

17 Give reasons for your answer

18 Have you had any training in the course of the project?

If YES, What type ?.....

19 Has the training been of any benefit to you? Yes ☐ No ☐

20 How have you applied what you learnt from the training?.....

.....

21 What obstacles did you encounter in the application?.....

.....

.....

22 Have there been any follow-up visits after the training? Yes ☐ No ☐

23 What can be done to improve the training and or its application?.....

.....

24 In what ways has the project been beneficial to you in terms of

- Shelter
- Food
- Health
- Savings
- Children's education
- Entertainment
- Other investment

25 How satisfied are you with the SSIAPP project? High ☐ Average ☐ Low ☐

26 In what ways can the project be improved.....

.....

27 How would you evaluate the support services provided by the project

- Co-operative.....
- Extension services .....
- Credit facility .....
- Farm inputs .....
- Irrigation management .....

7

28 How do you find the irrigation management system

- Water availability .....
- Water scheduling .....
- Maintenance .....
- Any other .....

8

Appendix 2: Questionnaire for Sectional Heads

MANAGEMENT DEVELOPMENT AND PRODUCTIVITY INSTITUTE (MDPI)

QUESTIONNAIRE FOR SECTIONAL HEADS

1. Sectional Activities.

   a) Farm Management, Extension and Farmers Organisation ☐

   b) Cultivation ☐

   c) Agricultural Machinery ☐

   d) Water Management ☐

   e) Training ☐

2) Main functions.

.....

.....

.....

.....

.....

.....

3) With regards to the objectives of SSIAP, what have been the achievements of your section.

   a) Improvement in Farming Systems.

.....

.....

.....

.....

.....

.....

.....

.....

b) Increase in Farmers Income.

.....

.....

.....

.....

.....

.....

.....

c) What activities are farmers performing differently under SSIAPP.

.....

.....

.....

.....

.....

.....

.....

4) Problems encountered during project implementation.

.....

.....

.....

.....

.....

.....

.....

5) Suggested solutions.

.....

.....

.....

.....

.....

.....

6) **Training/Workshops**

i) Have you had any project related training/workshops?
Yes ☐ No ☐

ii) Areas of training.

.....

.....

.....

.....

.....

iii) Application of knowledge to your work.

a) Highly Applicable ☐ b) Applicable ☐

c) Not Applicable ☐

iv) Relevance of training towards project sustainability.

a) Very Relevant ☐ b) Relevant ☐

c) Not Relevant ☐

v) How many other departmental staff have had project related training?

.....

.....

.....

.....

.....

Appendix 3: Questionnaire for Implementors

MANAGEMENT DEVELOPMENT AND PRODUCTIVITY INSTITUTE (MDPI)

QUESTIONNAIRE FOR THE SURVEY OF PROJECT IMPLEMENTORS

The overall goal of the Small-Scale Irrigated Agriculture Project (SSIAPP) is to establish a suitable farming systems for small-scale irrigated farming and consequently to increase the income of farmers.

The Management Development and Productivity Institute (MDPI). as the Consultant, has been contracted to conduct a post implementation project evaluation of all the components of the SSIAPP.

The purpose of this questionnaire is to assess the effectiveness SSIAPP from the viewpoint of the implementers. Please help us by completing the questionnaire as frankly as possible.

Thank you.

SECTION A

1. What is your role in the SSIAPP ?

....

....

....

....

....

2. Have you ever been involved in a project similar to SSIAPP? Yes ☐ No ☐

3. If yes. please provide details (Nam and location):

Project a).... ....

Project b).... ....

Project c).... ....

Project d).... ....

Project e).... ....

1

4. What is the status of those other projects?

a) Operational	☐	In a poor state	☐	Abandoned	☐
b) Operational	☐	In a poor state	☐	Abandoned	☐
c) Operational	☐	In a poor state	☐	Abandoned	☐
d) Operational	☐	In a poor state	☐	Abandoned	☐
e) Operational	☐	In a poor state	☐	Abandoned	☐

5. Explain your responses to question 5.

Project a).... ....

Project b).... ....

Project c).... ....

Project d).... ....

Project e).... ....

6. Are there any special provisions in SSIAPP as compared to the projects?

....

....

....

7. What are the special features introduced in SSIAPP so as to ensure sustainability?

....

....

....

8. How would you rate the sustainability of the projects?

	Ashaiman	Okyereko
• Very high	☐	☐
• High	☐	☐
• Fairly high	☐	☐
• Low	☐	☐

9. Give reasons for your responses to Q8. ....

....

....

....

10. Who constitute the target group of the SSIAPP?

....

11. What is the target population size? (No. of farmers)
Ashaiman..... .... .Okyereko..... ....

12. What proportion of the target population has access to the project services and/or inputs?

Ashaimn .....

Okyereko.....

13. What proportion of the target population received particular services and/or inputs so far?

	1999	2000	20001
Irrigation services			
Land preparation			
Credit services			
Extension services			

14. In your view, what proportion of the adopting population used the project services and/or inputs exactly as expected or instructed?

Ashaiman.....

Okyereko.....

3

SECTION B

Please tick as appropriate

1- Very Poor 2- Poor 3 - Average 4 - Good 5 - Very Good

Rating	1	2	3	4	5
A. Continued delivery of services					
Volume & stability of services					
Efficiency of service delivery					
Quality of services					
Satisfaction of beneficiaries					
Distribution of benefits among economic and social groups					
B Maintenance of physical infrastructure					
Condition of physical infrastructure					
Condition of plant and equipment					
Adequacy of maintenance procedures					
Efficiency of cost recovery and adequacy of operating budget					
Beneficiary involvement in maintenance procedures					
C Long-term institutional capacity					
Capacity and mandate of the principal operating agency					
Stability of staff and budget of operating agency					
Adequacy of interagency coordination					
Adequacy of coordination with community organisations and beneficiaries					
Flexibility and capacity to adopt project to changing circumstances					
D Support from key stakeholders					
Stability and strength of support from international agencies					
Stability and strength of support from national government					
Stability and strength of support from local government					
Stability and strength of support at the community level					
Ability of project to avoid becoming politically controversial					

THANK YOU

Appendix 4: Expenditure and Income Figures for Selected Crops

EXPENDITURE ON MAIZE PER ACRE				
ACTIVITY	MAIZE			
	1998	1999	2000	2001
Land Preparation	260,000	300,000	420,000	500,000
Seed	12,000	24,000	48,000	60,000
Chemicals	85,000	90,000	120,000	150,000
Fertilizer	120,000	150,000	350,000	420,000
Harvesting	0	0	0	0
Labour	100,000	150,000	250,000	300,000
Total	578,998	715,999	1,190,000	1,432,001

EXPENDITURE ON RICE PER ACRE				
ACTIVITY	1998	1999	2000	2001
Land Preparation	120,000	180,000	200,000	300,000
Seed	45,000	60,000	80,000	50,000
Chemicals	85,000	120,000	140,000	150,000
Fertilizer	150,000	210,000	350,000	450,000
Harvesting	260,000	320,000	400,000	500,000
Labour	70,000	120,000	180,000	500,000
Total	731,998	1,011,999	1,352,000	1,952,001

EXPENDITURE ON OKRO PER ACRE				
ACTIVITY	1998	1999	2000	2001
Land Preparation	270,000	350,000	420,000	800,000
Seed	100,000	150,000	250,000	200,000
Chemicals	300,000	450,000	600,000	1,000,000
Fertilizer	320,000	370,000	550,000	1,200,000
Harvesting	0	0	0	0
Labour	450,000	500,000	550,000	600,000
Total	1,441,998	1,821,999	2,372,000	3,802,001

EXPENDITURE ON CABBAGE PER ACRE				
ACTIVITY	1998	1999	2000	2001
Land Preparation	260,000	350,000	420,000	400,000
Seed	160,000	200,000	320,000	400,000
Chemicals	100,000	150,000	250,000	500,000
Fertilizer	150,000	180,000	350,000	320,000
Harvesting	0	0	0	0
Labour	200,000	270,000	350,000	600,000
Total	871,998	1,151,999	1,692,000	2,222,001

MAIZE				
	1998	1999	2000	2001
INCOME	2,400,000	2,800,000	4,000,000	4,500,000
EXPENDITURE	578,998	715,999	1,190,000	1,432,001
Expenditure/Income	24%	26%	30%	32%

RICE				
	1998	1999	2000	2001
INCOME	1,800,000	2,400,000	3,000,000	4,200,000
EXPENDITURE	731,998	1,011,999	1,352,000	1,952,001
Expenditure/Income	41%	42%	45%	46%

OKRO				
	1998	1999	2000	2001
INCOME	4,400,000	6,200,000	6,800,000	9,600,000
EXPENDITURE	1,441,998	1,821,999	2,372,000	3,802,001
Expenditure/Income	33%	29%	35%	40%

CABBAGE				
	1998	1999	2000	2001
INCOME	5,500,000	7,800,000	9,500,000	12,000,000
EXPENDITURE	871,998	1,151,999	1,692,000	2,222,001
Expenditure/Income	16%	15%	18%	19%

EXPENDITURE GROWTH RATE FOR MAIZE				
YEAR	1998	1999	2000	2001
	578,998	715,999	1,190,000	1,432,001
GROWTH RATE	0	1.24	1.66	1.20

EXPENDITURE GROWTH RATE FOR RICE				
YEAR	1998	1999	2000	2001
	731,998	1,011,999	1,352,000	1,952,001
GROWTH RATE	0.00	1.38	1.34	1.44

EXPENDITURE GROWTH RATE FOR OKRA				
YEAR	1998	1999	2000	2001
	1,441,998	1,821,999	2,372,000	3,802,001
GROWTH RATE	0.00	1.26	1.30	1.60

EXPENDITURE GROWTH RATE FOR CABBAGE				
YEAR	1998	1999	2000	2001
	871,998	1,151,999	1,692,000	2,222,001
GROWTH RATE	0.00	1.32	1.47	1.31

INCOME OF CROPS PER ACRE					
CROP	YEAR	1998	1999	2000	2001
MAIZE		2,400,000	2,800,000	4,000,000	4,500,000
RICE		1,800,000	2,400,000	3,000,000	4,200,000
OKRA		4,400,000	6,200,000	6,800,000	9,600,000
CABBAGE		5,500,000	7,800,000	9,500,000	12,000,000