

survey to two model sites (Ashaiman and Okyereko irrigation schemes), and discussions with relevant officials/staff members and farmers based on the five evaluation criteria mentioned above.

6. RESULTS OF THE EVALUATION

6-1 Relevance

6-1-1 Conformity of the Project Purpose and Overall Goal with the national development policy of the Ghanaian Government

One of the priority strategies for poverty reduction is "Promotion of commercial agriculture using environmental friendly technologies" as described in GPRS (Ghana Poverty Reduction Strategy). Also GPRS mentioned that "modernized agriculture based on rural development to ensure increased production and employment" is one of the five important issues under the government's medium term priorities (2003-2005). The Government makes efforts to increase the agricultural production in order to be self-sufficient in food crops and become an agro-industrial country.

While, "improvement of productivity and profitability of irrigated agriculture", "research & development and dissemination of appropriate technology", "human resource development and strengthen of agriculture related organization" are important issues in "Food and Agriculture Sector Development Policy (FASDEP) prepared by the Ministry of Food and Agriculture in September 2002.

The Project set its Overall Goal as "Farming systems in all irrigation schemes under GIDA are improved." and Project Purpose as "Guideline and strategy to improve farming systems in irrigation schemes under GIDA are established." respectively. Both Goal and Purpose contribute to production increase, profitability of irrigated agriculture, dissemination of appropriate technologies and strengthening of agriculture related organizations. Therefore, the Project Purpose and Overall Goal are very much in conformity with the policy of the Government of Ghana.

6-1-2 Relevance to the needs of farmers

The Final Evaluation Report for the SSIAPP prepared in February 2002, mentioned necessity of further improvement of farming system as well as further improvement of farming support system in model sites. So follow up activities to improve farming system in both Ashaiman and Okyereko irrigation schemes are based on the needs of farmers of those

two irrigation schemes.

Improvement of the farming systems in irrigated agriculture is a crucial need for farmers in the other 20 irrigation schemes under GIDA. So the technical guideline for irrigated agriculture, that is made up of basic component technologies about vegetable cultivation, rice cultivation, water management, farm management & extension/farmers' organization and agricultural machinery, will be very useful for dissemination of technologies to farmers. This is so because prior to this there was no guideline which had compiled the necessary basic technologies for irrigated agriculture in one book. The strategies indicating action plans for improvement of irrigated agriculture based on the needs of farmers (through bottom-up decision making) are also very effective. Therefore, the technical guideline and the strategies are in conformity with the needs of farmers in irrigated agriculture.

6-1-3 Conformity with Japan's official development assistance (ODA) policy to Ghana

One of the priority subjects in ODA policy of Japan to Ghana is agricultural development through improvement of agricultural productivity with agricultural technology, farm management and organizing farmer's group, etc.

Agricultural development is also priority assistance subject of JICA to Ghana. Assistance for improvement of productivity and income generation with sustainability in agriculture, forestry and fishery is considered as important issues by JICA. So the Project conforms to Japan's ODA policy and priority assistance subjects of JICA.

6-1-4 Relevance of Japanese technical know-how in the cooperation field

Japan has technologies for irrigated agriculture. JICA has long experience of cooperation in the field of irrigated agriculture in many countries, including Ghana. It is judged to be very rational to execute technical cooperation in the field by JICA.

Conclusion:

The Project Purpose and Overall Goal are very relevant to the development policy of Ghana, needs of farmers in irrigated agriculture, Japan's ODA policy to Ghana, and Japanese technical know-how and experience.

6-2 Effectiveness

6-2-1 Effectiveness in terms of Project Purpose

The Project Purpose, verifiable indicator and degree of achievement of the indicator are as

follows.

Project Purpose: "Guideline and strategy to improve farming systems in irrigation schemes under GIDA are established."

Verifiable indicator for the Project Purpose	Achievement degree of the indicator
Guideline and strategy of GIDA are approved by the Joint Coordinating Committee. (By July 31, 2004)	The Guideline and the Strategy were already prepared by the Project taking into consideration the results of discussions and opinions of all stakeholders. GIDA approved the guideline and the strategy officially as GIDA's document on May 18, 2004. It is expected that Joint Coordinating Committee of the Project will approve the guideline and the strategy at the Joint Coordinating Committee meeting on June 3, 2004.

So the Team concluded that the targets of indicator were achieved. However, it is necessary to evaluate the contents of the guidelines and the strategies from the viewpoints of usefulness and appropriateness for the users (farmers and extension officers, etc.).

6-2-2 Evaluation of the contents of the technical guidelines

As previously mentioned, the technical guidelines for irrigated agriculture are composed of basic component technologies about vegetable cultivation, rice cultivation, water management, farm management & extension/farmers' organization and agricultural machinery. The counterpart personnel of GIDA and Japanese Experts evaluated highly the contents of the guideline on the following points:

- (a) Appropriateness to solve existing problems and needs of farmers.
- (b) Applicability to 22 irrigation schemes under GIDA.
- (c) Suitability of technical level for introducing its technology by farmers.
- (d) Ease of understanding by farmers and extension officers of GIDA.

It is very important to point out that the technical guidelines have been prepared through consultation with representatives of farmers in 22 irrigation schemes using draft guidelines, including solutions to problems that farmers frequently ask. The guidelines used a lot of illustrations, photos and tables for easy understanding.

It is worth mentioning that prior to this, there was no guideline like this in Ghana, which had compiled the necessary basic technologies for irrigated agriculture in one book.

Technologies explained in the Technical Guidelines vary from engineer level to farmers' level by Chapters. They are expected to be utilized by a wide range of people.

While the Project's tremendous efforts to prepare the first comprehensive technical guidelines for wide range of people are highly appreciated, it is recommended that the technical guidelines be improved further in future with due consideration to the following.

(1) Clarification of necessary technologies and methodologies for improvement of irrigation farming systems

As the Guidelines introduce many technologies and methodologies possible to be applied theoretically, readers may be puzzled which technologies should be applied. It is recommended that as a guideline, advantages and disadvantages of each technology be explained if there are options for application in a particular circumstance.

(2) Uniformity of the technical level

Technical level of the contents of the Guidelines¹ varies much chapter by chapter. Some parts of the guidelines look more like practical extension manuals² for farmers (e.g. Chapter 2 Rice Cultivation), while other parts look more like textbook³ to be used in technical school (e.g. Chapter 3 Water Management; Chapter 5 Agricultural Machinery). If it is expected to be utilized as a comprehensive guideline, it is recommended that anticipated readers be specified and that technical level of each content be simplified as much as possible.

(3) Clear definition of "farming system"

Definition of "farming system" is not clearly explained. Farming system may be defined as the integration of individual farming activities and relevant supporting service activities, which will help to realize higher crop production as well as farm profit in a sustainable way but yet environmentally friendly. Importance of the integration of various activities should be emphasized in the Guidelines.

¹ Guideline: an official recommendation indicating how something should be done or what sort of action should be taken in a particular circumstance.

² Manual: a book that contains information and instruction about the operation of a machine or how to do something.

³ Textbook: a book that treats a subject comprehensively and is used by students as a basis for study.

6-2-3 Evaluation of the contents of the strategy

The counterpart personnel of GIDA and Japanese Experts also evaluated highly the contents of the strategy on the following points.

- (a) Appropriateness to solve existing problems and needs of farmers.
- (b) Realization of the action plans in the strategy (initiative of farmers, collaboration with the authorities concerned and financial capacity to implement, etc.)
- (c) Ease of understanding by farmers and extension officers of GIDA.

It is also important to mention that this is the first strategy prepared through bottom-up decision making with farmers (farmers' participatory workshops) and the action plans under implementation in those irrigation schemes.

Conclusion:

All the outputs of the Project are well designated to achieve the Project Purpose and have contributed effectively to the achievement of Project Purpose. Accordingly, the effectiveness of the Project is highly rated.

6-3 Efficiency

6-3-1 Inputs by both governments

Inputs by both governments are indicated in Annexes 1 to 6. (List of Japanese Experts, List of Ghanaian Counterpart Personnel Trained in Japan, List of Major Machinery and Equipment provided by Japan, Local Cost borne by Japan, List of Ghanaian Counterpart Personnel Directly Assigned to the Project, Budgetary Allocation by the Ghanaian).

6-3-2 Appropriateness of Inputs (quantity, quality and timing of Inputs)

Dispatch of Japanese experts (long-term and short-term), acceptance of Ghanaian counterparts for training in Japan, provision of equipment and allocated budget by Japanese side were almost appropriate in term of quantity, quality and timing according to the results of questionnaire survey to the counterparts. Counterparts pointed out that assignment period of some Japanese short-term experts was too short to allow for efficient transfer of technology (knowledge). Equipment were procured based on the request from Ghanaian side and utilized properly.

The number of Counterpart personnel assigned to the Project is 37. Among those 37 counterparts, resignation at the retirement age is one person, resignation for job change is

two persons, and leave of absence from work is two persons (study in master course and engage in a business of multilateral donors agency). Resignation and leave of absence had brought negative influence on the project activities, because those persons were head of section with more experience and knowledge on respective field (vegetable cultivation and rice cultivation).

Regarding the local cost expenditure by the Ghanaian side, budgetary allocation was not sufficient due to difficult financial constraints. However, the Ghanaian side has made efforts to provide budget for the expenses of training of the Project, equipment purchase and improvement of facilities using fund from the agriculture sector loan of the World Bank.

6-3-3 Achievement of the Outputs

(1) Achievement of the Output 1. "Farming system in Ashaiman irrigation scheme is improved."

Verifiable indicators for the Output 1	Achievement degree of the indicators
1. More than 80% of the farmers in Ashaiman appreciate the farming support system.	89% of the farmers in Ashaiman appreciate the farming support system according to the results of impact survey implemented in February 2004.

Indicator for the Output 1 is achieved according to the results of the impact survey.

Overall Assessment of Support Services by the Farmers in Ashaiman

Table 1 shows the evaluation survey results of the support services provided under the Project in Ashaiman.

Table 1: Evaluation of Support Services Provided under the Project by Ashaiman Farmers

(Unit: %)

Support services	High	Average	Low	Very low	Total
Cooperative system*1	39	55	3	3	100
Extension services*1	43	45	11	1	100
Irrigation water management*1	77	20	2	1	100
Use of agricultural machinery*1	51	32	14	3	100
Credit facilities*2	39	54	4	3	100
Farm inputs*2	50	48	1	1	100
Maintenance of agric. machinery*2	30	44	21	5	100
Mean	47	43	8	2	100

Note: Sample size is 77 (farmers).

Remarks: *1: provided under the Project; *2: provided by the Ashaiman cooperative society

Source: Field survey conducted by Management Development and Productivity Institute; February 2004

In Ashaiman, 47% of the respondents highly appreciated the Project intervention on support services on average, followed by average (43%), low (8%) and very low (2%). Among services, 77% highly appreciated irrigation water management, while only 30% appreciated maintenance of agricultural machinery. The interview with the farmers by the Team revealed that most of them appreciated yield increases which were brought about by the Project's intervention such as input support through credit facility, technical guidance on rice cultivation including line planting, nursery bed making with proper amount of seeding, and variety selection, flush irrigation to eliminate salts accumulated in upper layer of soils, use of paddy weeder, etc.

(2) Achievement of the Output 2. "Farming system in Okyereko irrigation scheme is improved."

Verifiable indicators for the Output 2	Achievement degree of the indicators
2-1 Income from irrigation farming in Okyereko is increased in follow-up period.	56% of the farmers in Okyereko answered that income from irrigated farming had increased in follow-up period. Also 80% of farmers answered that their standard of living become better compared situation before follow-up period.
2-2 More than 80% of the farmers in Okyereko appreciate the contents of guidance on crop management and management of cooperative.	80% of the farmers in Okyereko appreciate support service on crop management by the Project and 81% of the farmers appreciate support service about management of cooperative.

Indicator 2-2 for the Output 2 is achieved according to the results of the impact survey.

Regarding the indicator 2-1 for the Output 2, more than 50% of farmers answered that their income had increased and 80% of them answered their standard of living had become better compared to the situation before. So it is judged that the Output 2 was achieved.

Overall Assessment of Support Services by the Farmers in the Okyereko

Table 2 shows the evaluation survey results of the support services provided under the Project in Okyereko.

Table 2: Evaluation of Support Services Provided under the Project by Okyereko Farmers

(Unit: %)

Support services	High	Average	Low	Very low	Total
Cooperative system*1	81	19	0	0	100
Extension services*1	80	20	0	0	100
Irrigation water management*1	88	12	0	0	100
Use of agricultural machinery*1	84	12	2	2	100
Credit facilities*2	80	20	0	0	100

Farm inputs*2	98	2	0	0	100
Maintenance of agric. Machinery*2	76	20	2	2	100
Mean	84	15	0.5	0.5	100

Note: Sample size is 59 (farmers)

Remarks: *1: provided under the Project; *2: provided by the Okyereko cooperative society

Source: Field survey conducted by Management Development and Productivity Institute; February 2004

In Okyereko, on the other hand, 84% of the respondents highly appreciated the support services on average, followed by average appreciation (15%), low and very low appreciation (1% respectively). Among services, 98% highly appreciated farm inputs, while 76% appreciated maintenance of agric. machinery. Through the interview with the farmers in Okyereko by the Team, it is recognized that they admitted various positive effects derived from the Project, including double cropping of rice, acquiring new information through technical guidance, training, study tour, etc., reduction in harvest losses, yield increase, better living standard attained, better insight for cooperative idea, etc.

The relatively large difference in the level of appreciation to the support services during the Project period between Ashaiman farmers and Okyereko farmers may be attributable to the difference in environment in practicing agriculture in the respective schemes. Therefore, the effectiveness of the Project on each scheme is discussed individually as follows.

Discussion and Results on the Effectiveness of the Project in Ashaiman

The Ashaiman irrigation scheme has various advantages in agriculture including its location nearby the larger market, relatively abundant water available, easy access to extension (adjacent to IDC), etc. During the five years of SSIAPP intervention, Ashaiman farmers had the advantage of receiving technical guidance more often than Okyereko farmers and acquired high skills in farming.

Farm land of the Ashaiman farmers, however, is almost confined to the irrigated area with a little over one acre per person on the average, while the Okyereko farmers have upland in stool land owned by the Okyereko Chief three times as large as irrigated area with some one acre.

The Ashaiman farmers, therefore, have to pursue intensive agriculture to gain maximum profit. In recent years, the price of local rice has fallen due to the severe competition in marketing with imported rice. More farmers have shifted their cropping from rice based to vegetable based (see Table 3).

Table 3: Change in Cropping Area by Cropping Season in Ashaiman Irrigation Scheme

Cropping	Wet season cropping (ha)			Dry season cropping (ha)		
	Rice	Vegetable	Total	Rice	Vegetable	Total
2000	25.7	23.7	49.4			
2000/01				7.7	26.1	33.8
2001	32.2	20.5	52.7			
2001/02				23.8	26.3	50.1
2002	33.2	21.8	55.0			
2002/03				5.3	18.7	24.0
2003	18.53	28.74	47.3			

Note: Follow up phase started in August, 2002.

Source: SSIAPP

Vegetables are grown individually and they can be marketed also individually due to readily available market nearby the scheme. Thanks to the abundant water available in the reservoir during the last several years, farmers can easily draw water whenever they want to irrigate their vegetables. Besides, many farmers in Ashaiman have other businesses in town, which put them relatively in the high income level of society who could have easier access to formal credit. Further, unlike the case of Okyereko, where villagers are of the same origin and live in an isolated village under the strong leadership of the Chief, the farmers in Ashaiman originate from various parts of the Country, for which social tie among them is not so strong.

All these conditions could contribute to the low interest in communal efforts of water management, cooperative activities, payment of irrigation service fee, application for credit from farmers' bank, etc.

During the interview session, one farmer complained that the Project had put too much emphasis on rice cultivation in terms of expertise of Japanese experts assigned to the Project.

Nevertheless, 77% of the respondents in the Ashaiman scheme answered that their farm income have increased during the Project period, and 83% answered their living standard have improved during the same period. Based on the above discussions, although the inputs from the Project (for example, experts in the field of vegetable cultivation) have not satisfied some farmers, most farmers recognized the benefit gained from the Project. This evidence supports that Output 1 "Farming system in Ashaiman irrigation scheme is improved" has been achieved.

Discussion and Results on the Effectiveness of the Project in Okyereko

In contrast to Ashaiman, higher appreciation to the support services of the Project by the Okyereko farmers could be due to more frequent visit for the technical guidance and monitoring by the Project staff including the Japanese experts during the Project period, from which they have gained a lot of new information and skills. As a result of the successful technical guidance on initial growth of rice in terms of better transplanting, use of pure seed and better land leveling, and as a result of better water management with favorable climate conditions, yield of wet season rice in Okyereko increased by 10% to 4.5 ton per hectare during the Project period as well as remarkable expansion of dry season paddy area. It is remarkable that the number of farmers who attained higher yield (more than 4.0 ton per hectare) of rice increased, as shown in Table 4.

Table 4: Distribution of Rice Yield by Farmers in the Okyereko Irrigation Scheme

Yield (kg/ha)	2002 (wet season rice)		2003 (wet season rice)	
	No. of farmers	%	No. of farmers	%
2000 and below	2	3.3		
2001-3000	10	16.4	1	2.0
3001-4000	14	23.0	11	22.0
4001-5000	12	19.7	25	50.0
5001-6000	14	23.0	11	22.0
6001-7000	6	9.8	1	2.0
7001-8000	2	3.3		
8001 and over	1	1.6	1	2.0
Total	61	100.0	50	100.0

Source: SSIAPP F/U

The introduction of weeder contributed to the reduction in weeding time, which resulted in the increase in time for other jobs like women's house works.

According to the interview survey conducted by a local consultant, 56% of the respondents answered that their income level has increased and 79% of the respondents admitted that their living standard has been improved.

Judging from the above discussions, it can be said that the effectiveness of the Project intervention to the people of Okyereko is very high.

(3) Achievement of the Output 3. "Necessary technologies and methodologies for improvement of irrigation farming systems are clarified."

Verifiable indicators for Output 3	Achievement degree of indicators
3. A guideline for improvement of irrigation farming systems is established.	A guideline for improvement of irrigation farming systems is already prepared by the Project.

A technical guideline is already prepared. So it is judged that Output 3 was achieved.

(4) Achievement of the Output 4. "Needs and tasks for improvement of farming systems in 20 irrigation schemes are identified"

Verifiable indicators for the Output 4	Achievement degree of the indicators
A database including information such as farmer's situations, needs and tasks for improvement is prepared for 20 irrigation schemes.	A strategy has been prepared indicating needs and tasks for improvement of 20 irrigation schemes. With regard to the database, some more precise information on 20 irrigation schemes is necessary. It will take certain period of time to accomplish the database.

Some more data collection is necessary to create the database completely. But the strategy has been prepared as an important output of the activities through farmers participatory workshops. Therefore it is judged that the Output 4 is almost achieved by the Project.

(5) Conclusion regarding achievement of the Outputs

Most of the indicators for the Outputs have already been achieved, while the remaining few are expected to be achieved.

6-3-4 Linkage between Inputs and Outputs

It is judged that because Inputs from both sides were made as planned and properly, targeted Outputs have been achieved sufficiently. In other words, Inputs converted to Outputs efficiently.

Conclusion:

There are some negative factors which influenced the efficiency of the Project. But, in general, it is assessed that the efficiency of the Project is highly rated.

6-4 Impacts

6-4-1 Possibility of achieving the Overall Goal

Attaining the Overall Goal of the improvement of farming systems in all irrigation schemes under GIDA totally depends on the efforts of GIDA after the Project has phased out.

After a series of strategy formulation workshops, farmers in the respective GIDA irrigation schemes have started their responsible activities according to the set action plan. As a result, many positive effects including income increase, production increase, irrigation water saved, more farmers organized, etc., have already been reported.

However, many of these positive effects are derived from the improvement of individual technologies based on the training and workshops. More efforts should be made to improve individual technologies further and more importantly to integrate individual improved technologies (soft and hard) into a farming system, otherwise sustainability could not be assured.

While the farmers are ready to fulfill their responsibilities, it is essential for GIDA to continue to make efforts to support farmers in the respective irrigation schemes, according to the set strategies and action plans, in which GIDA is expected to play various roles including facilitation of credit fund sourcing, provision of technical training on crop cultivation and water management, facilitation of organizing farmers, rehabilitation of deteriorated irrigation facilities, etc.

Accordingly, the role of GIDA in supporting farmers is very important toward the achievement of the Overall Goal.

6-4-2 Technical impacts

(1) Capacity building of counterparts

Counterparts personnel acquired not only techniques on how to implement farmers' participatory workshop but also capability to look at situation of irrigation schemes objectively and to think logically for problem solution.

(2) Increase of yield

Increase of yield was reported in most irrigation schemes. For example, yield of rice increased from 4.5 ton/ha to 6.2 ton/ha as result of intervention of the Project and implementation of action plans in Afife irrigation scheme.

(3) Other technical impact

Interview of scheme managers and farmers' leaders of 20 irrigation schemes revealed that there are a lot of positive impacts accrued in most of the irrigation schemes under GIDA by the Project. Those impacts include (a) improvement of cropping pattern; (b) proper

maintenance of irrigation facilities; (c) improvement of water management; iv) reduction in production cost; etc. These impacts are mainly induced through a series of workshops and training conducted by the Project.

6-4-3 Organizational impacts

(1) Confidence and enthusiasm of farmers in Okyereko

Some of the Evaluation Team members who participated in the previous Evaluation two years ago, observed the positive change in the attitude of the farmers in before and after the Project period, in case of the Okyereko irrigation scheme. They looked more confident and enthusiastic.

(2) Activation and strengthening of cooperatives

The implementation of the Project has resulted in the activation and strengthening of cooperatives as indicated by the increase in numbers of cooperative members, registration of cooperatives (more than 10 cooperatives submitted application for registration), improvement of marketing such as selling their vegetable products jointly.

(3) Recognition of importance of support to existing irrigation schemes

GIDA's staff understood the importance of improvement of productivity in existing irrigation schemes through the rehabilitation of existing irrigation facilities, rather than construction of new irrigation schemes. Also GIDA understood the importance of providing support services related soft-aspects such as strengthening of farmers' organization, technical guidance of crop cultivation, water management, etc.

6-4-4 Socio-economic impacts

(1) Improvement of awareness of farmers

Farmers understood GIDA's budgetary constraint and difficulty in getting a lot of governmental support as used to be the case. Farmers now have the understanding that they should execute activities by their own initiatives (self-help activities).

Strategies and action plans formulated in each irrigation scheme through a series of workshop are considered helpful to raise the momentum of the farmers in the schemes in improving their farming activities. The farmers have started to fulfill their respective responsibilities according to the set action plan. Their activities were supported by the trainings and monitoring conducted by the Project.

(2) Improvement of relationship among farmers and between farmers and GIDA

Relations among farmers have also become strong in several schemes as a result of farmers' participation in various activities related to the Project. Some of the farmers from surrounding communities of the pilot schemes often visit the model project sites to learn from them. Also relationship of mutual trust between farmers and GIDA staff has been improved.

(3) Impacts on education and women

According to the impact survey conducted by the local consultants, some 80% of the respondents answered that their living standard has been improved in both model project sites of Ashaiman and Okyereko. According to the interview with the farmers in Okyereko, this positive impact has been attributed not only to economic reason or income increase that enabled female children to have higher education but also to socio-cultural reasons such as reduction in farming time through introduction of weeder, which enabled women to have more time for house work, including taking care of their children than before.

6-4-5 Financial impacts

About half of the farmers in Okyereko that responded to the impact survey done in first quarter of this year, answered that their income had increased as a result of the Project. And nearly 80% of them answered that their standard of living had become better because of increased quantity of food available in their home, better health for their family, etc.

6-5 Prospects for Sustainability

6-5-1 Prospects for policy and institutional sustainability

The Government of Ghana has irrigation development target in GPRS that aims at developing 5,000ha of new irrigation systems annually and 100,000ha of irrigation development till 2015. However, the Government currently has no irrigation policy to realize this target.

GIDA is now intending to formulate a feasible irrigation policy and visions with assistance from donor agencies. So, sustainability of GIDA depends on the policy formulation on irrigation sector. While, GIDA is only the institution to manage government irrigation schemes. The Chief Executive of GIDA acknowledges that GIDA will not be privatized and that the GIDA will continue to take the lead roles and responsibilities. It implies that GIDA will be institutionally sustainable.

6-5-2 Prospects for financial sustainability

GIDA has limited financial resources allocated by the Government. Most of governmental agencies are facing equally the constraint. This causes limited budget allocation for support activities to farmers and conduct training courses, etc. Delayed payment of wages for GIDA staff is also happening. According to the data on GIDA expenditure in 2003, only 6% (approximately 400 million Cedi) of total budget for GIDA was allocated for the services to manage the irrigation schemes. The prospect for financial sustainability of GIDA is depressing.

6-5-3 Prospects for technical sustainability

(1) Counterparts

Counterparts have been working together with Japanese experts during the Project periods and have acquired high skills through daily on-the-job training and training in Japan. Especially during the follow-up period, they participated in the preparation of "Technical guidelines" and conducted a series of technical training to various irrigation schemes under GIDA. Technical skills of the counterpart personnel are likely to be sustained on the assumption that they would remain in GIDA in future.

(2) Farmers

Technical skills have been transferred to farmers in both two model irrigation schemes. In particular, farmers in Okyereko acquired enough technical skills to practice double cropping of rice with higher yield. As far as they keep the momentum in producing more, and as far as their socio-cultural ties are strong, their technical skill could be sustained and further improved.

In the case of Ashaiman, the technical skills of the farmers are relatively higher such that they can select best crops to cultivate in terms of profit.

On the other hand, farmers in other irrigation schemes have started to practice cultivation using acquired technology through a series of training conducted by the Project, and several remarkable effects have been reported. But it is necessary for them to be supported further to improve their technical skill further and to integrate those into better farming system.

6-5-4 Prospects for organizational & management sustainability

GIDA's organizational and management sustainability mainly depends on financial situation. Farmers' organizations in two model sites (in Okyereko and Ashaiman) have good

sustainability in respect to its organization and management. But it is necessary for more time and support to be extended to farmers' cooperatives in the other 20 irrigation schemes to enable them become sustainable.

7. CONCLUSIONS

The Project is in conformity, very well, with the needs of small-scale farmers in irrigated agriculture of Ghana as well as Food and Agriculture Sector Development Policy (FASDEP) of the Government of Ghana and the cooperation policy of Japan. All the targets of indicators for the Project Purpose and the Outputs of the Project are either already achieved or almost expected to be achieved by the end of the Project period. Moreover, various kinds of positive impacts have been produced as results of the Project activities. Especially, as results of the implementation of action plans within the strategies prepared through farmers' participation in 22 irrigation schemes under GIDA. Regarding sustainability, there is some weakness because of financial constraint.

Taking every evaluation results into consideration, it can be said that the Project was successfully implemented with great effectiveness, impact, and achievement of the Project Purpose. Also the Project has established a basis toward the achievement of Overall Goal of the Project "Farming systems in all irrigation schemes under GIDA are improved."

In conclusion, based on a series of discussion with the relevant Ghanaian officials and counterparts as well as the result of the surveys conducted by a local consultant and the Team, it is fair to say that the Project has achieved the objectives set by the R/D. Therefore, the Joint Evaluation Team concluded that it is appropriate for JICA technical cooperation to terminate on July 31, 2004 as scheduled.

8. RECOMMENDATIONS

Regardless of the achievements and impacts of the Project described in the previous chapters, it has been shown by the GIDA officials, farmer representatives, Japanese experts that further efforts are vital to sustain and improve the Project achievements in conjunction with Farmers' Participatory Irrigation Management (FPIM) that was introduced in Ghana in 1990's. The following Table 5 shows the issues on the way forward and the recommendations.

Table 5: Issues and recommendations

	Issues	Recommendations
1	Inadequate government support for FPIM	Provision of adequate funding and other government assistance for GIDA. Guidance and dissemination of the necessary skills
2	Low level of understanding of FPIM	Establishment of the laws and regulation concerned and effective dissemination of information on FPIM
3	FPIM is beyond the present farmers' economic capabilities	Consideration of government subsidy or the application of differential tariffs for pump irrigation, and sharing of irrigation management
4	Inadequate funding for the implementation of GIDA's role in irrigation management	Increase budget allocation for irrigation sector. Explore other sources of funding irrigated agriculture development.
5	Lack of feasible policy and vision	Establishment of feasible policy and vision

(1) Guidance and dissemination of the necessary skills

To increase farmers' income, GIDA must increasingly focus on the guidance and dissemination of necessary skills to the farmers. The necessary skills and information to be disseminated by GIDA, as the lead governmental agency, include (a) irrigation water management, (b) operation and maintenance (O&M) of the irrigation facilities, (c) O&M of the agricultural machinery, (d) marketing, (e) farmers' organizations, etc. For GIDA to effectively implement these, it requires adequate financial and other government assistance.

The Irrigation Development Center (IDC) under GIDA will be a base for such guidance and training. In this regard, emphasis should be placed on strengthening the activities and functions of the IDC at Ashaiman as Center of Excellence for irrigation research and development and also the training of GIDA staff, researchers and farmers.

(2) Establishment of the laws and regulation concerned and effective dissemination and information on FPIM

Since introduction of FPIM in 1990's, there is no official law and regulation regarding FPIM. To ensure the effectiveness and sustainability of irrigation management under FPIM, the establishment and dissemination of the laws and regulation concerned are essential in the areas, (a) role and responsibilities of farmer's organizations in irrigation management, (b) role and responsibilities of GIDA (the government) in irrigation management, (c) agreement document in irrigation management between GIDA and each farmers' organization, (d) cost sharing between the government and each farmers' organization in terms of future

rehabilitation of the facilities, (e) property rights of the facilities, (f) water rights, (g) land tenure, (h) right to cultivation, (i) irrigation service charge, and others.

(3) Consideration of government subsidy or the application of differential tariffs for pump irrigation, and sharing of irrigation management

Irrigation development can not be satisfied only by gravity irrigation type due to topographical features in Ghana. In other words, pump irrigation is inevitable in order to increase the irrigation area. However, if the present electricity tariff system continues to apply, as is happening at the moment, pump irrigation farming may not have sustainability. It is recommended that the government of Ghana considers the introduction of a favorable policy to the irrigation sector through discounted electricity tariffs and lower cost of fuel for the pump irrigation schemes.

In addition, it is recommendable to sustain FPIM with consideration of the present farmers' economic capabilities that the sharing of irrigation management responsibilities between the government and farmers' organization should be determined by a consideration of the scale of irrigation scheme (irrigation area), type of irrigation, target crops at each scheme and farmers' economic and social situation. The proportion of sharing to manage irrigation scheme between the government and farmers' organization must be defined in the agreement through in depth discussion between both bodies at each irrigation scheme

(4) Increase budget allocation for irrigation sector

The budget allocation from the central government to GIDA is extremely small, so that the necessary works such as new development, rehabilitation and improvement of irrigation farming can not be carried out without external support. Increasing the budget allocation corresponding to the importance of the sector in the Government policy is indispensable for the way forward to sustain irrigation management in Ghana. In addition, GIDA may have to diversify ways of getting funds, e.g. look at the possibility of lobbying and obtaining part of the District Assembly Common Fund for irrigation infrastructure development.

(5) Establishment of feasible policy and vision

There is neither a feasible policy nor a vision to promote irrigation farming in Ghana. The Government of Ghana has a plan to develop 5,000 ha of new irrigation area every year in GPRS. However, it seems to be impractical, numerically and over-ambitious goal from past achievement and present condition of irrigation schemes. It is, therefore, essential to establish GIDA's own feasible policy and vision for irrigation farming.

9. LESSONS LEARNED FROM THE PROJECT

(1) Putting farmers first

One of the Project impacts worth mentioning is the strong motivation of the farmers to improve the agricultural production in the respective irrigation schemes, the motivation of which has been created through a series of workshop and training supported by GIDA.

In order to implement a project successfully, therefore, it is necessary to let the farmers take the front role and allow them to take initiative in thinking and acting towards development with proper guidance and support. It is essential for them to gather momentum in helping themselves.

(2) Integration of component technologies and supporting activities into a farming system

The success story of the Okyereko irrigation scheme under the Project is due to the established farming system, that is, improved farming practices which are supported by GIDA through provision of various services.

In order to ensure the sustainability of irrigated agriculture, therefore, it is necessary to establish a firm farming system which consists of component technologies (crop cultivation, water management, agricultural machinery, and farmers organization) with supporting services (credit for inputs, technical guidance, training, etc.).

(3) Crop selection for irrigated agriculture

Many farmers in the Ashaiman irrigation scheme pursue profitable agriculture, changing their crops from rice to high value vegetables like okra, green maize, cabbages, chilies, tomatoes, chinese cabbages, etc.

In the light of the high production costs in irrigated agriculture in general, and of low price of rice under the severe competition with imported rice, rice business under irrigation may not be so attractive. Crops to be cultivated under irrigation should be selected with due consideration to profitability and marketability.

Annex 1 List of Japanese Experts during the follow up program

1-1 Long- term Japanese Expert

No.	Nome of Expert	Field	Period of Assignment					
			From	To	2002	2003	2004	
1	Dr. Narihide NAGAYO	Chief Advisor/System Coordinator	2002.8.1	2004.7.31				
2	Mr. Takao INAMORI	Coordinator/Training	2002.8.1	2004.7.31				
3	Mr. Tomotsu SEIJI	Cultivation	2002.8.1	2004.7.31				
4	Mr. Nobuharu MORITA	Farmers Organization & Farm Management	2002.8.1	2004.7.31				

1-2 Short- term Japanese Expert

No.	Nome of Expert	Field	Period of Assignment					
			From	To	2002	2003	2004	
1	Mr. Takahiro MIYOSHI	Participatory Development Planning	2002.11.16	2002.12.20				
2	Mr. Koji YAMAGUCHI	Manpower Weeder Manufacture Guidance	2003.2.9	2003.3.31				
3	Mr. Saergio SUAJOY	Manpower Weeder Manufacture Guidance	2003.2.9	2003.3.31				
4	Mr. Kiyoshi SHIRATORI	Small- scale Agriculture Promotion Planning	2003.6.3	2003.8.24				
5	Dr. Mamoru SATO	Pest and Disease Management in Vegetable	2003.10.20	2003.12.20				
6	Mr. Hideki KUIMAGAI	Operation and Maintenance in Generator	2003.11.29	2003.12.13				
7	Mr. Takashi KURAUTI	Operation and Maintenance in Pump Station	2002.11.29	2003.12.13				
8	Mr. Koji YAMAGUCHI	Fabrication and Diffusion of Manpower Weeder	2003.11.27	2004.1.22				
9	Mr. Katsumasa SATO	Water Management	2003.12.8	2004.2.7				

Annex 2 List of Ghanaian Counterpart Personnel Trained in Japan

No.	Nome of C/P Staff	Position Field of Training	Period of Assignment					
			From	To	2002	2003	2004	
1	Mr. Kwaku OWUSU BAAH	Acting Chief Executive of GIDA Chief Director of MOFA Administration of Irrigated Agriculture	2003.3.10	2003.3.22		■		
2	Mr. Joseph Kenneth ANTWI	Deputy Director, IDC Officer in charge The role of Agriculture Cooperation to be played in Activation of Rural Economy	2003.5.6	2003.7.6		■		
3	Mr. Sammy Abbey	Assistant Agric. Engineer Water Management System Irrigation and Drainage for Rural Development	2004.3.7	2004.11.19				■
4	Mr. Benedictus AGBEKO	Assistant Agronomist The role of Agriculture Cooperation to be played in Activation of Rural Economy	2004.5.11	2004.7.11				■

Annex 3 List of Major Machinery and Equipment Provided by Japan

JFY	Equipment	Amount	Qty	Frequency of Use	Condition	Remark
2002	Photo copier	¢ 35, 450, 000	1	Good	Good	\$1 = ¢ 8,200
2003	Spare Part for rice mill	¥1, 462, 580				
	Spare Part for power tiller	\$10, 864. 82				
	Water gauge A	¥41, 300	10	will be installed at irrigation facilities	Good	
	Water gauge B	¥20, 000	10	will be installed at irrigation facilities	Good	
	Seed moisture	¥110, 000	2	Good	Good	
	Planimeter	¥66, 120	1	Good	Good	

Remark: JFY= Japanese Fiscal Year

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Annex 4 List of Local Cost Borne by Japan

(Unit: US Dollar)

Description Japanese Fiscal Year	2002	2003	2004	Total
Local Running Cost	41,985.12	55,253.28	59,518.23	156,756.63
Enlightenment and Extension/ Local Adaptation Activities	57,713.37	121,314.58	-	179,027.95
Total	99,698.49	176,567.86	59,518.23	335,784.58

Remarks: Amount of year 2002 is from August to December, and amount of year 2004 is from January to June

Annex 5 List of Ghanaian Counterpart Personnel Directly Assigned to the Project

No.	Name of C/P Staff	Field Rank	Period of Assignment		Remarks	2002	2003	2004
			From	To				
1	Mr. Kuwaku Owusu BAAH	General Director Chief Director, MOFA	2002.8.2	Present				
2	Mr. Oduro Kwadjo GYARTENG	Project Director Chief Executive, GIDA	2002.8.1	2002.8.10	Retired			
3	Mr. Kuwaku OWUSU BAAH	Project Director/ Acting Chief Executive, GIDA, (Chief Director, MOFA)	2002.9.16	2003.6.8				
4	Mr. Daniel LAMPTEY	Project Director Chief Executive, GIDA	2003.6.9	Present				
5	Mr. Sammy M. AKAGBOR	Project Manager Director, Operation, GIDA	2002.8.1	Present				
6	Mr. Yaw YEBOAH	Planning and Management Director, Planning, GIDA	2002.8.1	Present				
7	Mr. Seth Oduro KONADU	Deputy Director Deputy Director, Operation, GIDA	2002.8.1	Present				
8	Mr. James AKATSE	Deputy Director, IDC Deputy Director, Agronomy, IDC	2002.8.1	Present	Leave 2003.8.1-2004.7.1			
9	Mr. Joseph K. ANTWI	Deputy Director, IDC Deputy Director, Soil and Water, IDC	2002.8.1	Present				
10	Mr. Simon APIO	Deputy Director, IDC Deputy Director, Plant & Equipment, IDC	2002.8.1	Present				
11	Ms. Joyce AMPOFO	Deputy Director, IDC Deputy Director, Soil and Water, IDC	2002.8.1	Present				
12	Mr. James AKATSE	Cultivation Deputy Director	2002.8.1	Present	Leave 2003.8.1-2004.7.1			
13	Mr. Peter M.D. ABUGAH	Cultivation Principal Agronomist	2002.8.1	2003.10.3	Resign			
14	Mr. Albert F. SWATSON	Cultivation Agronomist	2002.8.1	Present				
15	Ms. Alice AMOAH	Cultivation Assistant Agronomist	2003.11.7	Present				
16	Mr. Bans AKUTEY	Cultivation Principal Technical Officer	2002.8.1	Present				
17	Mr. Prosper AKUMANI	Cultivation Agronomist	2002.8.1	Present				
18	Mr. S.K.A. BONNEY	Cultivation Agronomist	2002.8.1	Present	Study Leave			

No.	Name of C/P Staff	Field Rank	Remarks	Period of Assignment		2002	2003	2004
				From	To			
19	Mr. Charles N. ADEKU	Cultivation Assistant Agronomist		2002.8.1	Present			
20	Mr. Timothy NUWORDU	Cultivation Assistant Agronomist		2003.7.1	Present			
21	Mr. Thomas A. ODONKOR	Water management Engineer	Resign	2003.8.1	200.3.7.1			
22	Mr. Busia N. DAWUNI	Water management Assistant Engineer		2002.8.1	Present			
23	Mr. Emanuel SACKEY	Water management Assistant Engineer		2002.8.1	Present			
24	Mr. Samuel Y. ABBEY	Water management Engineer		2002.8.1	Present			
25	Mr. Samuel B. BOAKYE	Farm Management, Extension & Farmers' Organisation Assistant Agronomist		2002.8.1	Present			
26	Mr. Benedictus AGBEKO	Farm Management, Extension & Farmers' Organisation Assistant Agronomist		2002.8.1	Present			
27	Ms. Memuna MATTAH	Farm Management, Extension & Farmers' Organisation Assistant Agronomist		2003.1.2	Present			
28	Ms. Juliet ADJEI-KYERE	Farm Management, Extension & Farmers' Organisation Assistant Agronomist		2003.7.1	Present			
29	Mr. Nii Hanson OFOI	Farm Management, Extension & Farmers' Organisation Principal Technical Officer		2003.2.1	Present			
30	Mr. Albert N. NTIM	Farm Management, Extension & Farmers' Organisation Principal Production Officer		2002.8.1	Present			
31	Mr. Simon APIO	Agricultural Machinery Deputy Director		2002.8.1	Present			
32	Mr. Raphael K. DENUTSUI	Agricultural Machinery Chief Technician Engineer		2002.8.1	Present			
33	Mr. Peter OFORI-ATTAH	Agricultural Machinery Chief Technician Engineer		2002.8.1	Present			
34	Mr. A.K. FORDJOUR	Agricultural Machinery Principal Technician Engineer		2002.8.1	Present			
35	Ms. Joyce AMPOFO	Soil and Water Deputy Director		2002.8.1	Present			
36	Mr. Sammy Deyi	Soil and Water Principal Agronomist		2002.8.1	Present			
37	Mr. Chris K. FERUTA-BENEE	Training Principal Agronomist		2002.8.1	Present			

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Annex 6 Budgetary Allocation by Ghanaian side

(Unit: GHC million)

	2002	2003	2004	Total
Running Cost	71	364	104	539

Remarks: Amount of year 2002 is from August to December, and amount of year 2004 is from January to March

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Annex 7. Project Design Matrix for Follow-up Program

Project name: Small-scale Irrigated Agriculture Promotion Project in the Republic of Ghana F/U
 Project area: Mainly two model schemes (Ashaiman and Okyereko)

Project Period: August 1, 2002 to July 31, 2004

Target group: Farmers in the two model schemes
 (Final Beneficiaries: Farmers in all irrigation schemes)

Date: June 21, 2002

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>Overall Goal</p> <p>Farming systems in all irrigation schemes under GIDA are improved.</p>	<p>By July 31, 2010</p> <ol style="list-style-type: none"> Income from irrigation farming in all irrigation schemes under GIDA is increased. More than 80% of farmer in all irrigation schemes appreciate the effort of the government on improvement of irrigation farming. 	<p>1. Survey by GIDA.</p>	
<p>Project Purpose</p> <p>Guideline and strategy to improve farming systems in irrigation schemes under GIDA are established.</p>	<p>By July 31, 2004</p> <p>Guideline and strategy of GIDA are approved by the Joint GIDA Coordinating Committee.</p>	<ol style="list-style-type: none"> Minute of meeting of the Joint Coordinating Committee. Survey by SIAPP/GIDA. 	<ul style="list-style-type: none"> All stakeholders commit the program for Overall Goal. Function of irrigation schemes are maintained Marketing of produce improves GIDA staff and farmers apply the contents of the guidelines. Counterparts continue to work with GIDA.
<p>Outputs</p> <ol style="list-style-type: none"> Farming system in Ashaiman irrigation scheme is improved. Farming system in Okyereko irrigation scheme is improved. Necessary technologies and methodologies for improvement of irrigation farming systems are clarified. Needs and tasks for improvement of farming systems in 20 irrigation schemes are identified 	<ol style="list-style-type: none"> More than 80% of the farmers in Ashaiman appreciate the farming support system. 1 Income from irrigation farming in Okyereko is increased in follow-up period. 2-2 More than 80% of the farmers in Okyereko appreciate the contents of guidance on crop management and management of cooperative. 3 A guideline for improvement of irrigation farming systems is established 4 A database including information such as farmer's situations, needs and tasks for improvement is prepared for 20 irrigation schemes. 	<ol style="list-style-type: none"> Survey by SSIAPP/GIDA Survey by SSIAPP/GIDA Established guideline. Established database. 	

Annex 7. Project Design Matrix for Follow-up Program

Activities	Japanese Side	Ghanaian Side	Inputs	Adequate budgetary support by GIDA.
1. Improvement of farming system in Ashaiman irrigation scheme.	<Dispatch of Experts> • Long-term experts 1. Chief advisor/System Coordination 2. Cultivation 3. Farmers' Organization/ Farm Management 4. Coordinator/Training • Short-term experts • Dispatched if required.	<Land, Building and Facility> • Land and building for the Project and 2. Model Schemes. • Other required building and facility on mutual agreement	<Placement of Personnel> (Counterparts) • Project Director (Chief counterpart) 1. Chief Director, MOFA 2. Chief Executive, GIDA 3. Director, IDC • For technical fields 1. Cultivation 2. Water Management 3. Farmers' Organization/ Farm Management 4. Agricultural Machinery 5. Training	• Adequate budgetary support by GIDA. • Farmers' cooperatives are functional. • Irrigation service charge is paid by farmers. • Stable weather conditions.
1-1 To monitor operation of farming support services.	<Procurement of the Equipment> • If necessary <Training in Japan> • If necessary <Local Cost Expenditure> • If necessary			
1-2 To advise on the improvement of farming support service.				
2. Improvement of farming system in Okyereko irrigation scheme.				
2-1 To provide guidance on crop management.				
2-2 To provide guidance on management of cooperative.				
3. Clarification of technologies and methodologies for improvement of farming systems.				
3-1 To screen the outputs from 5 year cooperation period.				
3-2 To add necessary technologies and methodologies.				
3-3 To monitor farming systems in Ashaiman and Okyereko irrigation schemes.				
4. Identification of needs and tasks for improvement of farming systems in 20 irrigation schemes.				
4-1 To collect additional data from workshops and training courses.				
4-2 To create a database.				

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Annex 8. Progress of the Activities

Plan of activities based on PDM				Progress of the Project activities			Final expected results
Main items	Sub items	Schedule		Person in charge	Achievement of activities	Results	
		1st year	2nd year				
1. Improvement of farming system in Ashaiman irrigation scheme.	1-1. To monitor operation of farming support services. 1-2. To advise on the improvement of farming support service.		↑	C/P Japanese Experts	Monitoring on activities about farmer's organization and farmers' banking and advice on improvement of those activities. Monitoring and advice on technical aspects regarding farming support services.	Realization of irrigated agriculture with high profitability. Sustain appropriate operation of farmer's banking.	An established model scheme on irrigated agriculture in Ghana.
2. Improvement of farming system in Okyereko irrigation scheme.	2-1. To provide guidance on crop management 2-2. To provide guidance on management of cooperative		↑	C/P Japanese Experts	Guidance on rice seed production and rice cultivation technologies and instruction on strengthening of activities of farmers' organization. (Accounting and cooperative management)	Increase of rice yield, establishment of quality seed production and seed supply system. Active farmers' organization with high recovery rate of irrigation service charge.	An established model scheme on irrigated agriculture in Ghana.
3. Clarification of technologies and methodologies for improvement of farming systems. (Preparation of a technical guideline for improvement of irrigation farming system)	3-1. To screen the outputs from 5 year cooperation period. 3-2. To add necessary technologies and methodologies. 3.3. To monitor farming systems in Ashaiman and Okyereko irrigation schemes.		↑	C/P Japanese Experts	Review and analysis of technical results accumulated during 5 year cooperation of the Project. Analysis on applicability of technologies to other irrigation schemes through monitoring of farming system in Ashaiman and Okyereko irrigation schemes. Based on mentioned analysis and considering necessary technological items and opinions of stakeholders, a technical guideline was prepared.	A technical guideline for improvement of farming system in all irrigation schemes under supervision by GIDA is prepared and disseminated as a manual of instruction and a training material.	A technical guideline for improvement of farming system in all irrigation schemes under supervision by GIDA is prepared and disseminated as a manual of instruction and a training material.
4. Identification of needs and tasks for improvement of farming systems in 20 irrigation schemes. (Preparation of a strategy paper for improvement of farming system)	4-1. To collect additional data from workshops and training courses. 4-2 To create a database.		↑	C/P Japanese Experts	Farmer participatory workshops were held in 20 irrigation schemes and action plans for improved farming were prepared. Necessary information and data of irrigation schemes were also collected.	Preparation of strategy papers for improvement of irrigation farming. Preparation of database with information on irrigation schemes in Ghana. (There was some delay in data collection)	Strategy papers prepared and activities for improvement of farming according to the strategy papers started.

Project Design Matrix (F/U)

Project name: Small-scale Irrigated Agriculture Promotion Project in the Republic of Ghana F/U

Project area: Mainly two model schemes (Ashaiman and Okyereko)

Project Period: August 1, 2002 to July 31, 2004

Target group: Farmers in the two model schemes
(Final Beneficiaries: Farmers in all irrigation schemes)

Date: May 17, 2002

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>Overall Goal</p> <p>Farming systems in all irrigation schemes under GIDA are improved.</p>	<p>By July 31, 2010</p> <p>1. Income from irrigation farming in all irrigation scheme under GIDA is increased. 2. More than 80% of farmer in all irrigation scheme appreciate the effort of the government on improvement of irrigation farming.</p>	<p>1. Survey by GIDA.</p>	
<p>Project Purpose</p> <p>Guideline and strategy to improve farming systems in irrigation schemes under GIDA are established.</p>	<p>By July 31, 2004</p> <p>Guideline and strategy are approved by GIDA management committee.</p>	<p>1. Minute of meeting of GIDA management committee. 2. Survey by SSIAPP/GIDA.</p>	<ul style="list-style-type: none"> · All stakeholders commit the program for Overall Goal. · Function of irrigation schemes are maintained · Marketing of produce improves · GIDA staff and farmers apply the contents of the guidelines. · Counterparts continue to work with GIDA.
<p>Outputs</p> <p>1. Farming system in Ashaiman irrigation scheme is improved. 2. Farming system in Okyereko irrigation scheme is improved. 3. Necessary technologies and methodologies for improvement of irrigation farming systems are clarified. 4. Needs and tasks for improvement of farming systems in 20 irrigation schemes are identified</p>	<p>1. More than 80% of the farmers in Ashaiman appreciate the farming support system. 2-1 Income from irrigation farming in Okyereko is increased in follow-up period. 2-2 More than 80% of the farmers in Okyereko appreciate the contents of guidance on crop management and management of cooperative. 3. A guideline for improvement of irrigation farming systems is established 4. A database including information such as farmer's situations, needs and tasks for improvement is prepared for 20 irrigation schemes.</p>	<p>1. Survey by SSIAPP/GIDA. 2. Survey by SSIAPP/GIDA. 3. Established guideline. 4. Established database.</p>	

Activities	Inputs		<ul style="list-style-type: none"> · Adequate budgetary support by GIDA. · Farmers' cooperatives are functional. · ISF is paid by farmers. · Stable weather conditions.
<p>1. Improvement of farming system in Ashaiman irrigation scheme.</p> <p>1-1 To monitor operation of farming support services.</p> <p>1-2 To advise on the improvement of farming support service.</p> <p>2. Improvement of farming system in Okyereko irrigation scheme.</p> <p>2-1 To provide guidance on crop management.</p> <p>2-2 To provide guidance on management of cooperative.</p> <p>3. Clarification of technologies and methodologies for improvement of farming systems.</p> <p>3-1 To screen the outputs from 5 year cooperation period.</p> <p>3-2 To add necessary technologies and methodologies.</p> <p>3-3 To monitor farming systems in Ashaiman and Okereko irrigation schemes.</p> <p>4. Identification of needs and tasks for improvement of farming systems in 20 irrigation schemes.</p> <p>4-1 To collect additional data from workshops and training courses.</p> <p>4-2 To create a database.</p>	Japanese Side	Ghanaian Side	<p style="text-align: center;">Pre-conditions</p> <p>Government recognizes and continues to support irrigation agriculture.</p>
	<p><Dispatch of Experts></p> <ul style="list-style-type: none"> · Long-term experts <ol style="list-style-type: none"> 1. Chief advisor 2. Cultivation 3. Farmers' Organization/ Farm Management 4. Coordinator/Training · Short-term experts <p style="margin-left: 20px;">Dispatched if required.</p> <p><Procurement of the Equipment></p> <ul style="list-style-type: none"> · If necessary <p><Training in Japan></p> <ul style="list-style-type: none"> · If necessary <p><Local Cost Expenditure></p> <ul style="list-style-type: none"> · If necessary 	<p><Land, Building and Facility></p> <ul style="list-style-type: none"> · Land and building for the Project and <ol style="list-style-type: none"> 2 Model Schemes. · Other required building and facility on <p style="margin-left: 20px;">Mutual agreement</p> <p><Placement of Personnel> (Counterparts)</p> <ul style="list-style-type: none"> · Project Director (Chief counterpart) <ol style="list-style-type: none"> 1. Chief Director, MOFA 2. Chief Executive, GIDA 3. Director, IDC · For technical fields <ol style="list-style-type: none"> 1. Cultivation 2. Water Management 3. Farmers' Organization/ Farm Management 4. Agricultural Machinery 5. Training <p><Other Equipment not Procured by Japan></p> <p><Running Expenses></p> <ul style="list-style-type: none"> · Emolument · Operation and management of facilities · Utilities · Administrative fee for training · Other running cost · Budget for training 	

付属資料4 評価グリッド：ガーナ国灌漑小規模農業振興計画フォローアップ協力運営指導（終了時評価）調査

5項目	評価設問		判断基準・方法	必要なデータ	情報源	調査結果
	大項目	小項目				
妥当性	プロジェクトが目指す効果は、ガーナ国の国家政策に合致しているか			国家開発計画あるいは農業政策における灌漑農業振興計画の位置付けと内容	<ul style="list-style-type: none"> プロジェクト側作成資料及びガーナ国作成貧困削減戦略（GPRS） 食糧農業省政策 	<p>ガーナ国政府の貧困削減戦略では、貧困削減のための優先戦略の一つとして「環境にやさしい技術を利用した商業的農業の振興」が掲げられている。また、この GPRS では、政府の中期開発戦略（2003年～2005年）における重点として5つの事項を示し、その一つに「生産増加と雇用増加を確実にするため、農村開発を基礎とする農業近代化」が掲げられている。さらに、農業面での政府の重点課題は、食糧作物の自給のため農業生産を増加させ、農産工業国となることにある。</p> <p>また食糧農業省が2002年に作成した食糧農業セクター開発政策（FASDEP：Food and Agriculture Sector Development Policy）では、「灌漑農業の生産性向上と収益性向上」、「研究開発と適正技術の普及」、「人材開発と農業関連組織の強化」が、重点課題として掲げられている。</p>
	ターゲットグループの選定は妥当であったか	モデル事業地区の農民のニーズに合致するか		<ul style="list-style-type: none"> 灌漑事業地における営農システム改善ニーズの調査結果 農民の認識 	<ul style="list-style-type: none"> 報告書類、データベース 農民 	<p>本プロジェクトでは、モデル地区であるアシャマンとオチェレコに対する補完的支援活動が実施されている。これは、5年間の本格フェーズにおける終了時評価調査において、両地区の営農システムや営農支援システムの更なる改善が必要と評価されたことに基づき、このフォローアップ協力において、支援活動が実施されたものである。したがって、農民ニーズに基づき実施された協力である。また、インパクト調査結果によると、本プロジェクトによる農民への支援に対する両地区農民の満足度は高い。</p>
		全国の灌漑事業地区の農民のニーズにも合致するか		<ul style="list-style-type: none"> 灌漑事業地における営農システム改善ニーズの調査結果 灌漑公社スタッフの認識 農民の認識 	<ul style="list-style-type: none"> 報告書類、データベース 灌漑公社スタッフ 農民 	<p>GIDA 管轄下の20カ所の灌漑事業地における営農システム改善も当該地区の農民にとっては極めて重要な課題である。本プロジェクトの目標の一つである、「灌漑農業における技術ガイドライン」には、野菜栽培、水稻栽培、水管理、営農と普及並びに農民組織、農業機械という基礎的技術が含まれており、農民への技術普及に有効活用できる。さらに、これまで灌漑農業に関わる基礎的技術を1冊に取りまとめた本が無かったことから有益なものである。また、プロジェクト目標のもう一つの項目である「戦略」は、灌漑事業地の農民のニーズ（農民参加によりボトムアップ方式で意志決定）に基づき、灌漑農業改善を図る活動計画を作成し、それを示したものである。したがって、技術ガイドライン及び戦略は、灌漑農業地における農民のニーズに沿ったものである。</p>
		ターゲットグループの規模は適切か		対象農家数（灌漑農家）と各地区の総農家数、全国の農家数	プロジェクト側作成資料	<p>2カ所のモデル地区の農家数は約250戸、面積は約100ha。モデル地区を含むGIDA管轄下22カ所の灌漑事業地の総農家数は、10,588戸で、既開発面積は8,745haである。ガーナ国の灌漑農地面積（政府の灌漑事業地と民間の灌漑農地の両方を含む）は、13,500haで</p>

					<p>あるとされているので、本プロジェクトの対象は、全灌漑農地面積の約 65%に相当する。灌漑農地面積においては、本プロジェクトのターゲットグループ規模は適切であると判断できる。なお、天水農業を行っている面積は約 150 万 ha あるとされていることと比較すると、ターゲットグループの規模は小さくなる。</p>
日本の援助政策に合致しているか プロジェクトのアプローチは手段として妥当か	援助重点課題との関連性はあるか		我が国のガーナ国に対する援助重点分野	ガーナ国別援助計画（外務省）	<p>我が国の対ガーナ援助政策の重点分野は、1)農業開発、2)基礎的生活分野、3)経済構造改革、4)産業育成、5)経済インフラ整備、である。そして、農業分野における重点は、農業技術、農家経営、農民組織化など、農業生産性向上に向けた努力を支援することにある。本プロジェクトは、農業技術普及、農家経営改善、農民組織強化に基づく農業生産性向上に資するものであることから、我が国の援助政策との整合性が高い。</p>
	国別事業実施計画との関連性はあるか		農業分野の位置付け	国別事業実施計画（JICA）	<p>JICA のガーナ国に関する国別事業実施計画における重点分野の一つにも農業開発が掲げられ、農林水産業における持続的な生産・収入向上への支援に取り組む方針である。したがって、JICA の重点支援分野との整合性は高い。</p>
日本の技術の比較優位性はあるか			<ul style="list-style-type: none"> ・灌漑農業分野の援助実績 ・灌漑農業分野の日本の経験 	・JICA 担当事業部門	<p>我が国は水稲栽培を中心とする灌漑農業に関する技術を持ち、そしてこれまで JICA は、ガーナ国を含む多数の国において灌漑農業分野における協力を実施してきた経験がある。これまでの灌漑農業における技術的蓄積と途上国での協力実績・経験から、この種の技術協力を行うことは妥当であると言える。</p>

5項目	評価設問		判断基準・方法	必要なデータ	情報源	調査結果
有効性	アウトプットは達成されているか			(実績表のとおり)	・(実績表のとおり) ・C/P、専門家	(PDMで設定されたアウトプットの指標に対する達成度を、本評価グリッドの後に添付したので、それを参照のこと。)
	プロジェクト目標は達成されているか	灌漑事業地の営農システム改善のためのガイドラインが策定されたか		ガイドライン策定状況、内容と農民のニーズとの整合性	・ガイドライン ・灌漑公社スタッフ及び農民、C/P、専門家	<p>「灌漑農業のための技術ガイドライン」が既に作成され、GIDAの公式図書として承認された。</p> <p>内容的には、灌漑農業に関する基礎的技術として、野菜栽培、水稲栽培、水管理、営農と普及並びに農民組織、農業機械に関する説明が含まれている。</p> <p>高く評価すべき点として、本ガイドライン作成に際し22の灌漑事業地の農民代表にガイドライン草案を見せて意見を交わし、また、農民がよく直面する問題に対する解決策も取り入れて作成していることが挙げられる。また、特に栽培分野において、イラスト、写真、表を多数取り入れ、農民にも理解しやすい工夫が施されていることも長所である。さらに、これまでガーナ国に灌漑農業において必要とする基礎技術を一つの本に取りまとめたものが無かったことから、このような技術ガイドラインが作成されたことは高く評価される。</p> <p>一方で、ガイドラインの内容は農民の手引き書的なものから工学系の教科書的なものまで、分野によって技術水準が大きく異なっている。今後、より使いやすくなるよう、さらに改善されることが期待される。</p>
		営農システム改善のための戦略が策定されたか		戦略の策定状況と内容、有用性。	・戦略 ・食糧農業省及び灌漑公社スタッフ、C/P、専門家	<p>「既存灌漑プロジェクトの効果的利用のための戦略」が既に作成され、GIDAの公式図書として承認された。</p> <p>この戦略に示された、各灌漑事業地における営農システム改善のための戦略と行動計画は、農民参加によるワークショップ実施を通じて、農民が現在抱えている問題をどのように解決し、農民のニーズを満足させるかを、ボトムアップ方式の意志決定により策定された。したがって、まさに農民の意向に基づいた行動計画となっており、適切なものである。</p> <p>そして重要な点は、この様なボトムアップ方式により策定された戦略は、初めてのものであるということである。</p> <p>それに加えて、既に各灌漑事業地において戦略に基づく行動計画が実施されていること、そして、成果が現れつつあることも重要な点である。</p>

プロジェクトのアウトプットはプロジェクト目標の達成に貢献しているか	C/P の能力向上は貢献しているか（営農システム改善支援や戦略策定能力が身に付いたかどうか）		<ul style="list-style-type: none"> ・技術移転を受け、必要な能力を身につけた C/P の人数と割合 ・専門家の意見 	<ul style="list-style-type: none"> ・プロジェクト側作成資料 ・専門家 	<p>技術ガイドライン作成は、C/P が主体的に行っており、本格フェーズにおいて実証された技術を基に、その経験と知識をガイドラインの形で取りまとめたものであることから、C/P は必要な技術を身につけていると判断される。</p> <p>また、戦略作成においては、まず 14 名のファシリテーターが育成され、その後実際に各灌漑事業地でワークショップ開催の経験を積むことにより、戦略策定能力が十分身に付いている。</p>
	機材は有効活用されているか		機材の種類と使用頻度、管理状況	<ul style="list-style-type: none"> ・機材管理記録 ・C/P、専門家 	フォローアップ協力の 2 年間で調達された機材は最小限のものである。機材によってはこれから利用し始めるものもあるが、有効に活用されていると判断する。
	プロジェクト以外に貢献した要因はあるか		関係者の意見	<ul style="list-style-type: none"> ・プロジェクト側作成資料 ・C/P、専門家 	特になし。
プロジェクト目標達成を阻害した要因はあるか	C/P の離職による影響はあったか		離職率、離職理由	<ul style="list-style-type: none"> ・プロジェクト側作成資料 ・C/P、専門家 	<p>フォローアップ協力の 2 年間に C/P として従事したスタッフの累計は 37 名で、この内、1 名が定年退職し、2 名が転職、2 名が休職している。（休職者のうち、1 名は修士コース進学、もう 1 名は国際機関の仕事に従事。）転職者と休職者があったことは、本プロジェクトの活動を実施する上で、負の影響があった。特に、野菜栽培と水稻栽培のそれぞれのセクションの長であり、多くの経験と知識を有していた人物がいなくなったことの影響が大きかった。</p>
	その他の影響はあるか		関係者の意見	<ul style="list-style-type: none"> ・プロジェクト側作成資料 ・C/P、専門家 	<p>ガーナ側のローカルコスト負担については、政府の財政難のため、十分な支出はなかった。ただし、ガーナ側のローカルコスト負担があまり期待できないことを想定して、日本側が活動費用を準備していたので、プロジェクト活動の実施に対する悪影響はなかった。</p> <p>なお、C/P の給料の遅配があり、C/P にとっては、積極的に活動する意欲を妨げる要因にもなりかねなかったが、大きな影響はなかった。</p>

5 項目	評価設問		判断基準・方法	必要なデータ	情報源	調査結果
効率性	達成されたアウトプットからみて、投入の質・量・タイミングは適切か	専門家派遣人数、専門分野・能力、派遣時期・期間は適切か		<ul style="list-style-type: none"> 派遣実績 専門家の働きぶり 関係者の意見 	<ul style="list-style-type: none"> 実績表 プロジェクト側作成資料 C/P、専門家 	<p>実績は、ミニッツの Annex1 参照の事。長期専門家 4 名と短期専門家 9 名が派遣された。C/P へのアンケート結果から、日本人専門家派遣のタイミング、期間、専門能力、コミュニケーション能力が適切であったとの評価ができる。ただ、短期専門家の派遣期間が必ずしも適切でなかったとの意見が見られた。また、専門分野が水稻栽培に偏り、野菜栽培に関する技術支援が十分ではなかったとの意見もあった。</p> <p>全体としては、専門家派遣は適切であったと言える。</p>
		供与機材の種類、量、設置時期は適切か		<ul style="list-style-type: none"> 機材供与実績 機材利用状況 関係者の意見 	<ul style="list-style-type: none"> 実績表 プロジェクト側作成資料 C/P、専門家 	<p>実績は、ミニッツの Annex3 参照の事。</p> <p>C/P へのアンケート結果から、供与機材の量、種類、時期は適切であったと言える。</p>
		研修員受入人数、研修内容、研修期間、受入時期は適切か		<ul style="list-style-type: none"> 研修員受け入れ実績 関係者の意見 	<ul style="list-style-type: none"> 実績表 C/P、専門家 	<p>実績は、ミニッツの Annex2 参照の事。</p> <p>計 4 名を日本での研修に受入（2 名は、現在研修受講中）。</p> <p>C/P へのアンケート結果から、日本での研修はその時期、期間、研修内容において適切であったと言える。</p>
		C/P の人数、配置時期、能力は適切か		<ul style="list-style-type: none"> C/P 配置状況 関係者の意見 	<ul style="list-style-type: none"> C/P 配置実績表 C/P、専門家 	<p>実績は、ミニッツの Annex5 参照の事。</p> <p>フォローアップ協力の 2 年間に C/P として従事したスタッフの累計は 37 名で、内訳は、マネージメント関連が 11 名、栽培セクションに 9 名、水管理セクションに 4 名、営農・普及・農民組織セクションに 6 名、農業機械セクションに 4 名、土壌・水セクションに 2 名、研修セクションに 1 名である。</p> <p>日本人専門家及び C/P へのアンケート結果から、C/P の配置時期、人数、能力は適切であったと言える。</p>
		建物・施設の質、規模、利便性は適切か		<ul style="list-style-type: none"> 建物、施設の現状 関係者の意見 	<ul style="list-style-type: none"> C/P、専門家 	<p>日本人専門家の意見としては、建物・施設の質・規模は適切であったと評価している。ただし、ガーナ側予算による機器購入については、適切でなかったと指摘されている（筆記用具でさえ購入する予算が無い）。</p> <p>建物・施設の適切さについての C/P の意見は、「適切である」から「不適切である」まであり、意見が分かれている。</p>

	<p>ガーナ側のプロジェクト予算は適切な規模か</p>		<ul style="list-style-type: none"> ・相手側コスト負担実績 ・灌漑公社の年間予算 ・関係者の意見 	<ul style="list-style-type: none"> ・プロジェクト側作成資料 ・C/P、専門家 	<p>実績は、ミニッツの Annex6 参照の事。</p> <table border="1"> <thead> <tr> <th></th> <th>2002 (8~12月)</th> <th>2003 (1~12月)</th> <th>2004 (1~3月)</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Running Cost (百万セディ)</td> <td>71</td> <td>364</td> <td>104</td> <td>539</td> </tr> <tr> <td>円概算値 (円)</td> <td>918,824</td> <td>4,710,588</td> <td>1,345,882</td> <td>6,975,294</td> </tr> </tbody> </table> <p>相手側負担コストを 1 ドル=110 円、1 ドル=8,500 セディで概略の円換算値を計算したものが、上表である。1 年 8 カ月間の支出合計は約 700 万円である。これらは、通常経費(ガソリン代、事務用品購入など)、研修費用、研修センターの家具類購入と研修センターの駐車場整備等に使用された。</p> <p>アンケートにおける日本人専門家や C/P の意見では、運営予算は適切なものであったとの意見が多い。ただし、これはもともと GIDA の活動予算自体が極めて少ない状況にあり、本プロジェクトに対する十分な活動予算は期待できないことに基づいた判断と見られる。</p>		2002 (8~12月)	2003 (1~12月)	2004 (1~3月)	Total	Running Cost (百万セディ)	71	364	104	539	円概算値 (円)	918,824	4,710,588	1,345,882	6,975,294
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	<p>C/P の能力向上が貢献しているか</p>		<ul style="list-style-type: none"> ・技術移転を受けた C/P の割合 ・専門家の意見 	<ul style="list-style-type: none"> ・プロジェクト側作成資料 ・専門家 	<p>既述のとおり、技術移転を受けた C/P の一部が、転職するというマイナス面もあったが、モデル地区農民に対する営農システム改善支援、技術ガイドラインの作成、ワークショップを通じた戦略及び行動計画の策定、農民への研修実施等の活動は、C/P が主体で行っており、日本人専門家は技術的アドバイスを行っている。本プロジェクトで設定したアウトプットである、2 モデル地区の営農システム改善、営農システム改善のために必要な技術と手法の明確化、20 カ所の灌漑事業地の営農システム改善のためのニーズと課題の確認、の達成度は高く、これは C/P の能力向上に起因するものである。</p>															
プロジェクトマネージメントは適切であったか	<p>プロジェクト目標達成に向けインプットが適切に運営管理されたか</p>		<ul style="list-style-type: none"> ・関係者の意見 	<ul style="list-style-type: none"> ・プロジェクト側作成資料 ・C/P、専門家 	<p>C/P 及び日本人専門家へのアンケート結果から、スタッフ配置、施設機器、予算の運営管理は適切に行われたと判断できる。</p>															
	<p>合同調整委員会は、適切に機能したか</p>		<ul style="list-style-type: none"> ・関係者の意見 	<ul style="list-style-type: none"> ・プロジェクト側作成資料 ・C/P、専門家 	<p>通常どおり機能した。C/P 及び日本人専門家へのアンケート結果からも、適切であったと言える。</p>															
効率性を阻害した要因はあるか			<ul style="list-style-type: none"> ・関係者の意見 	<ul style="list-style-type: none"> ・C/P、専門家 	<p>既述のとおり、一部の C/P の転職や休職により、その人物が有していた知識と経験が活かせない状況、特に野菜栽培と水稻栽培のセクションのチーフであった。スムーズに活動を進めるうえでの阻害要因となった。</p>															

5 項目	評価設問		判断基準・方法	必要なデータ	情報源	調査結果
インパクト	上位目標「灌漑公社管轄下における全灌漑事業地の営農システムが改善される」は達成される見込みか	灌漑公社管轄下の全灌漑事業地の灌漑農業による所得が増加する	実施前、実施後の比較	・関係者の意見	・食糧農業省及び灌漑公社スタッフ、C/P、専門家	各灌漑事業地では、本プロジェクトで策定した戦略に沿って行動計画を実施中である。その効果として、生産コスト低減、収量増加、販売価格の向上、所得増加等が報告されている。今後も行動計画が順調に進められ、GIDA 等の政府機関による適切な支援活動が継続するならば、さらなる所得増加につながる可能性が高い。ただし、灌漑事業地によっては灌漑施設のりハビリ実施やポンプ灌漑におけるコスト削減といった、大きな課題を抱えているところもあるので、そういった面の問題解決も必要となってくる。
		全灌漑事業地区の 80%以上の農民が政府の灌漑農業改善努力を評価するか		・関係者の意見	・食糧農業省及び灌漑公社スタッフ、C/P、専門家	本評価調査中、GIDA 管轄下の灌漑事業地の農民代表から意見を聞く機会が得られた。そこで灌漑事業地の農民代表は、本プロジェクトによる支援活動に感謝し、今後もこのプロジェクトのフォローアップ協力が継続されること希望すると表明した。農民と GIDA との間の信頼関係・協力関係は、本プロジェクト実施により大きく改善しており、GIDA が今後も適切な支援を提供することが肝要となる。
		灌漑営農システム改善ガイドラインは活用されているか、今後の活用の見通しはどうか		灌漑営農システム改善ガイドラインに基づき、農民に指導できる能力を身につけた灌漑公社や農業普及員等の人数と活動実績(地区名、農民数)	・プロジェクト側作成資料 ・食糧農業省及び灌漑公社スタッフ、C/P、専門家	技術ガイドラインは、その作成過程において農民の意見を聞きつつ、農民が抱える問題に対応した内容となっている。また理解しやすい様に、イラストや写真等が多く使用されている。今後、この技術ガイドラインは GIDA のスタッフ、普及員等に配布され、GIDA が管轄する全国 22 カ所の灌漑事業地の農民への指導書として利用される事になる。また、その他の灌漑地区(地方行政が主管する小規模灌漑地区(主として、世界銀行やアフリカ開発銀行、アラブ開発銀行による融資事業地区)での研修教材としても活用される予定になっている。その他、食糧農業省関連機関、大学等への配布も予定されている。(千部印刷予定) 普及員が農民を指導する際に用いるためには、技術ガイドラインの内容について、普及員を対象とする研修実施が必要となってくる。GIDA の C/P は、この技術ガイドライン作成に従事していることから、普及員への研修を実施する能力を十分持っている。したがって、今後、普及員への研修が実施されれば、この技術ガイドラインが十分活用される見通しは高い。
		営農システム改善のための戦略は活用されているか、今後の活用の見通しはどうか		戦略に基づき、戦略を実施している灌漑事業地区、面積、農民数。	・プロジェクト側作成資料 ・食糧農業省及び灌漑公社スタッフ、C/P、専門家	戦略は農民参加型ワークショップを通じて策定され、その中の行動計画(短期の行動計画と長期の行動計画がある)は、2003 年 3 月から、実施が始まっている。そして、すでに各種の改善効果が出始めている。 今回、全灌漑事業地のスキームマネージャーと農民代表が首都アクラに集まった機会を利用して、短期の行動計画と長期の行動計画実施により、どのような効果が出ているのかアンケートを取った。アンケートへの回答結果を別添資料 6 に示す。

<p>その他の波及効果はあるか</p>	<p>ガーナ国の灌漑農業開発政策に対する影響の有無</p>		<p>・関係者の意見</p>	<p>・プロジェクト側作成資料 ・食糧農業省及び灌漑公社スタッフ、C/P、専門家</p>	<p>既述のとおり、ガーナ国の貧困戦略には、毎年 5,000ha の新規灌漑開発が掲げられている一方、これを具体的に実現する施策が全くない状況である。また、灌漑セクター政策も無い。</p> <p>従来、ガーナ国における灌漑開発はトップダウン方式で実施されてきた。すなわち、農民の意見や考えを考慮することなく実施されてきた。その結果、農民が管理しにくい灌漑施設（ハード面）、当事者意識の欠如した施設管理（ソフト面）という問題が生じていた。</p> <p>しかし本プロジェクト実施による効果として、GIDA は、灌漑開発方針の非現実性と既存灌漑事業地の灌漑施設リハビリの必要性並びにボトムアップアプローチによる戦略策定とその実施の有用性を理解するようになってきている。そこで GIDA は、灌漑セクター政策の策定する方針を立て、援助機関にその支援を要請している。一方わが国に対しては、参加型灌漑管理に係る政策・法律・規則等の策定支援を含む技術協力の要請が出されている。本プロジェクトは、実現可能な灌漑農業政策が必要であるとの意識改革を GIDA にもたらしたと言える。なお、食糧農業省幹部職員においては、まだ認識不足がある。</p>
	<p>ガイドラインや戦略策定による影響</p>		<p>・関係者の意見</p>	<p>・プロジェクト側作成資料 ・食糧農業省及び灌漑公社スタッフ、C/P、専門家</p>	<p>戦略の策定による影響は、既に述べたとおり。</p> <p>灌漑農業に関する技術ガイドラインの策定は、ガーナ国において初めての事であり、大きな成果であり、今後これを活用することで大きなインパクトを与える可能性を持っている。</p>
	<p>研修やワークショップ実施による影響</p>		<p>・関係者の意見</p>	<p>・プロジェクト側作成資料 ・食糧農業省及び灌漑公社スタッフ、C/P、専門家</p>	<p>(1) 本プロジェクトでは、短期日本人専門家による指導で、ワークショップ開催のためのファシリテーターを養成した。どのように農民参加型ワークショップを実施するかに関する技術を C/P が身につけただけでなく、実際にワークショップのファシリテーター役を演じ、経験を積むことにより、灌漑事業地の現況を客観的に見る能力と問題解決のための論理的思考方法も身につけたことは重要なインパクトである。</p> <p>(2) 灌漑事業地のスキーム・マネージャーや農民リーダーからの聞き取りによると、本プロジェクトにより多くのインパクトが報告されている。主なインパクトとしては、1) 作付体系の改善、2) 灌漑施設の適切な管理、3) 水管理の改善、4) 生産コストの低減、などがある。これらのインパクトは主として、本プロジェクトによるワークショップ開催及び研修実施の結果としてもたらされたものである。</p> <p>(3) 農民の意識向上 農民は、GIDA に財政的脆弱性があること、そして以前のようには多量の政府支援が得られないことを理解し、そして農民自身が主導的に活動を実施すべきであることを理解するようになった（自助努力による活動の必要性）</p>

				<p>各灌漑事業地において、ワークショップを通じて作成された戦略とその中に含まれる行動計画は、農民の営農活動改善に対する積極性を高める上で大いに有効なものである。農民達は既に行動計画の中で農民が担うべき役割を実行し始めている。</p> <p>(4) 農民間あるいは農民と GIDA との関係の改善</p> <p>本プロジェクトにおける各種活動実施を通じて、いくつかの灌漑事業地における農民間の関係は改善・強化されている。</p> <p>また、これまでは GIDA の予算的制約から、GIDA 管轄下の灌漑事業地に対する農民支援サービスの提供は十分なものではなく、一方で農民側の政府に対する多大な依存心があったこともあって、GIDA と農民との関係は必ずしも良好とは言えず、不信感もあった。しかし、本プロジェクト実施により、農民と GIDA との相互信頼関係が改善されている。</p>
その他の影響(正負)はあるか		・関係者の意見	<ul style="list-style-type: none"> ・プロジェクト側作成資料 ・食糧農業省及び灌漑公社スタッフ、C/P、専門家 	<p>(1) オチェレコ地区農民の信頼と意気込み</p> <p>本評価調査に参加したガーナ国側評価メンバーの中には、2 年前に実施された本格フェーズの評価にも参加したメンバーがいる。そのメンバーによると、オチェレコ灌漑事業地の農民の態度が、2 年までと比べ、より積極的なものに変化していることが観察され、本プロジェクトに対する信頼と意気込みが高まっていることが感じられた。</p> <p>(2) 農民組合の活性化と強化</p> <p>本プロジェクト実施により、組合員の増加、組合の登録(10 以上の組合が登録申請を行ったと報告されている)、マーケティング改善(野菜の共同出荷)といったように組合の活性化や強化がもたらされている。</p> <p>(3) 教育面及び女性へのインパクト</p> <p>ローカルコンサルタントが実施したインパクト調査結果によれば、2 つのモデル地区(アシャマンとオチェレコ)の 80%の農民が生活水準の向上があったと回答している。本評価調査団のオチェレコ地区での聞き取りによれば、プロジェクトのインパクトとして、経済的な改善・所得向上がもたらされたことで女子により高い教育を受けられることが可能となった点や、除草機導入により農作業に費やす時間が少なくなったことで、女性達は、子供の世話を含む家事により多くの時間を割くことができるようになった点が挙げられた。</p> <p>(4) 財政的インパクト</p> <p>インパクト調査の結果によれば、オチェレコ地区の半数の農民が、本プロジェクト実施の結果として所得が増加したと回答しているまた、80%の農民が生活水準が向上し、以前と比べても家庭により多くの食糧があり、家族の健康も良くなったとしている。</p>

5項目	評価設問		判断基準・方法	必要なデータ	情報源	調査結果																	
自立発展性	灌漑公社の灌漑農業振興における位置付けは明確か			<ul style="list-style-type: none"> 政府・食糧農業省による支援の継続性 灌漑公社の役割 	<ul style="list-style-type: none"> 食糧農業省 灌漑公社スタッフ 	<p>既述のとおり、ガーナ国政府は GPRS において、灌漑開発の目標として、毎年 5,000ha の新規灌漑事業の開発を行い、2015 年までに延べ 100,000ha の新規灌漑開発を行うこととしている。しかし、政府はこの目標を達成するための具体的灌漑政策を持っていない。</p> <p>現在 GIDA は、援助機関の支援を受けつつ、実現可能な灌漑政策と展望を策定しようとしている。GIDA の自立発展性は、この灌漑セクターの政策策定にかかっていると考えられる。GIDA は、政府の灌漑事業地を管理する唯一の機関であり、民営化せず、その役割を今後も担っていくことを GIDA の総裁は表明している。GIDA の制度的自立発展性は確保されるものと見通される。</p>																	
	灌漑公社に事業を継続するだけの能力が備わっているか	運営管理能力は備わっているか		<ul style="list-style-type: none"> 各部門の機能 スタッフの配置状況・定着状況 関係者の意見 	<ul style="list-style-type: none"> 組織・運営規約 スタッフ配置表 C/P、専門家 	<p>GIDA は、22 カ所の灌漑事業地を管轄し、農民への支援サービスを提供している。総職員数は 304 名で、アクラの本部に 121 名、6 カ所の地域事務所に 73 名、22 カ所のプロジェクト事務所に 110 名が配置されている。本部には主要部署が 4 つあり、1) 予算計画・モニタリング・評価部、2) プロジェクト開発部、3) プロジェクト運営部（この中に、IDC：灌漑開発センターが含まれる）4) 会計・業務部、である。GIDA の役割は、灌漑・牧畜・内水面漁業の開発において、環境に配慮した、農民のための水資源開発、農産工業振興を図る計画作りと実施にある。具体的には、灌漑農業等に関する技術提供や助言が主となる。</p> <p>事業を運営管理する能力があるかどうかは、財政面に大きく左右される。現状のようにわずかな事業費しか予算の割り当てが無い状況では、限定的なものであると判断される。</p>																	
		財務状況は良好か		<ul style="list-style-type: none"> 灌漑公社の財務状況 関係者の意見 	<ul style="list-style-type: none"> 予算表 C/P、専門家 	<p>GIDA の財政は、基本的に慢性的な事業費不足という状況が続いている。下表に 2003 年の GIDA の予算の内訳を示す。</p> <table border="1"> <thead> <tr> <th>費目</th> <th>ガーナ政府</th> <th>援助機関</th> </tr> </thead> <tbody> <tr> <td>人件費</td> <td>548,183 US\$ (82%)</td> <td></td> </tr> <tr> <td>管理費</td> <td>78,045 US\$ (12%)</td> <td></td> </tr> <tr> <td>サービス費(事業費)</td> <td>43,974 US\$ (6%)</td> <td></td> </tr> <tr> <td>投資(施設建設)</td> <td></td> <td>2,699,093 US\$</td> </tr> <tr> <td>合計</td> <td>670,202 US\$ (100%)</td> <td></td> </tr> </tbody> </table> <p>GIDA の職員数は、約 300 名で、灌漑事業地 22 カ所を管轄している。2003 年の予算総額は、67 万ドルで、その内、人件費が 82% を占め、実際の活動に使用できる事業費は、わずか 6% で約 4.4 万 US\$ (500 万円弱) である。事実上、灌漑農業振興に向けた事業への支出は極めて限られており、ドナー機関からの援助無しには具体的な活動が行えない状況にある。</p>	費目	ガーナ政府	援助機関	人件費	548,183 US\$ (82%)		管理費	78,045 US\$ (12%)		サービス費(事業費)	43,974 US\$ (6%)		投資(施設建設)		2,699,093 US\$	合計	670,202 US\$ (100%)
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	自主財源確保あるいは、安定した活動予算の確保の見込みはあるか		<ul style="list-style-type: none"> ・自主財源確保あるいは安定した活動予算確保のための計画 ・関係者の意見 	<ul style="list-style-type: none"> ・食糧農業省・灌漑公社スタッフ ・C/P、専門家 	<p>上記のような GIDA の財政状況のため、IDC（灌漑開発センター）に対する事業費の割り当ては無く、わずかな管理費が支出されているだけとされている。IDC では、研修センターの施設貸出による料金収入、試験圃場で生産した種子の販売収入を基にして、「灌漑開発センター運営金制度」を設けている。しかし、その運営金は C/P の通勤バスの燃料費に充てると残らない状況である。</p> <p>また、GIDA の自主財源として、農民が支払う水利費の 10% を GIDA の本部に入金するという規定があるけれども、事実上機能していない。</p> <p>自主財源確保による活動費捻出の可能性は限られていると判断できる。食糧農業省が GIDA に対し、より多くの活動予算を割り当てることが必要である。</p>
移転された技術は定着していくか	「灌漑事業地の営農システム改善のためのガイドライン」を有効に活用できる人材が必要数、育成されたか		<ul style="list-style-type: none"> ・十分な能力を持つスタッフの人数 ・関係者の意見 	<ul style="list-style-type: none"> ・プロジェクト側作成資料 ・C/P、専門家 	<p>技術ガイドラインは、C/P と日本人専門家の助言により作成されたものであり、技術ガイドラインを使って農民を指導する役割を受け持つ普及員への教育はこれからの活動である。ガイドライン自体は、理解しやすい言葉使いと構成になっているので、有効に活用されると考えられる。</p> <p>担当分野別の現時点における C/P の人数は、</p> <ul style="list-style-type: none"> ・ 栽培部門： 6 名（この他に、休職中が 2 名いる） ・ 水管理部門： 3 名 ・ 営農・普及/農民組織部門： 6 名 ・ 農業機械部門： 4 名 ・ 土壌・水部門： 2 名 ・ 研修部門： 1 名
	C/P 自身による研修等の技術移転能力は向上したか		<ul style="list-style-type: none"> ・専門家による評価結果 ・C/P による自己評価結果 	<ul style="list-style-type: none"> ・専門家 ・C/P 	<p>技術的に自立可能な能力を C/P が身につけている。ただし、当初の 5 年間の本格フェーズと、2 年間のフォローアップフェーズを合わせて、11 名のカウンターパートがより高い給料を求めて、転職してしまっている。このような人材流出が続けば、技術的自立発展性を阻害する要因となる。</p>
	移転された技術は灌漑公社内や農民へ普及していくか		<ul style="list-style-type: none"> ・灌漑公社内における研修の有無 ・農民への研修の有無 ・関係者の意見 	<ul style="list-style-type: none"> ・C/P ・専門家 	<p>GIDA が今後も、普及員等の GIDA 職員への研修と農民等に対する研修・支援を継続していくならば、移転された技術は、GIDA 内部及び農民に普及していくであろう。ただし、財政的課題を克服し、必要な活動予算を計上する必要がある（現在、GIDA 独自の予算による研修活動は実施されていない）。</p>

		C/P は継続して勤務するか		・関係者の意見	・C/P、専門家	C/P が継続して勤務するかどうかは、待遇面や労働意欲を刺激する要素の有無に左右される。 (公務員の給料が安いことや、2~3カ月の遅配が発生することなどの負の要因はある。)
その他	自立発展性に影響を与えた貢献・阻害要因は何か			・関係者の意見	・食糧農業省及び灌漑公社スタッフ、C/P、専門家	当初の5カ年間の本格フェーズでは、灌漑技術センターを拠点とした技術開発と2カ所のモデル地区の営農システム確立が重点であった。その後、本プロジェクトで、それまでの協力成果を基礎に、その他の20カ所の灌漑事業地への協力を開始した。農民参加型ワークショップや農民対象の研修を実施することで、これまで、あまり技術習得の機会が得られなかった農民達への支援が始まり、農民の意見に基づく営農改善計画が実施されるようになってきた。各灌漑事業地の農民に営農改善に向けての具体的な目標が設定され、営農意欲が高まりつつある状況と言える。各灌漑事業地の灌漑農業が自立発展性を持つためには、農民自身の努力のみならず、GIDA や地方政府等の政府機関の適切な支援サービス提供を一層強化・継続する必要があると判断する。

別添資料 プロジェクトの実績表

プロジェクトの要約	指標	達成度
<p>上位目標</p> <p>灌漑公社管轄下における全灌漑事業地の営農システムが改善される</p>	<p>2010年7月31日までに、</p> <ol style="list-style-type: none"> 1. 灌漑公社管轄下の全灌漑事業地の灌漑農業による所得が増加する。 2. 全灌漑事業地区の80%以上の農民が政府の灌漑農業改善努力を評価する。 	<ol style="list-style-type: none"> 1. 所得増加があると報告されている灌漑事業地も出てきている。ただし、きちんとした調査は実施されていない。 2. 農民とGIDAとの関係は改善しつつあり、本プロジェクトへの評価は高い。
<p>プロジェクト目標</p> <p>灌漑公社管轄下の灌漑事業地の営農システムを改善するためのガイドラインと戦略が策定される</p>	<p>2004年7月31日までに、ガイドラインと戦略が合同調整委員会により承認される。</p>	<p>技術ガイドラインと戦略は、利害関係者との議論や意見を採り入れ作成された。2004年5月18日には、GIDAの公式文書として認証された。</p>
<p>成果（アウトプット）</p> <ol style="list-style-type: none"> 1. アシャマン灌漑事業地における営農システムが改善される 2. オチェレコ灌漑事業地における営農システムが改善される 3. 営農システム改善のために必要な技術、手法が明確化される 4. 20の灌漑事業地における営農システム改善のためのニーズと活動が確認される 	<ol style="list-style-type: none"> 1. アシャマン地区の80%以上の農家が営農支援システムを高く評価する。 2-1 オチェレコ地区の灌漑農業による所得が、このフォローアップ協力期間において増加する。 2-2 オチェレコ地区の80%以上の農民が栽培管理及び組合管理に係る指導内容につき高く評価する。 3. 灌漑営農システムの改善ガイドラインが策定される。 4. 20灌漑事業地区における農民の現状、農民のニーズ、営農システム改善のための方策等の情報を含むデータベースが作られる。 	<ol style="list-style-type: none"> 1. 2004年2月に実施されたインパクト調査結果によると、アシャマン地区の89%の農家が営農支援システムを評価している。（目標を達成した） 2-1 オチェレコ地区の56%の農家が、フォローアップ協力期間に、灌漑農業からの所得が増加したと回答している。また、同80%の農家がフォローアップ協力以前と比較して、生活水準が向上したと回答している。（目標を達成したと判断する） 2-2 オチェレコ地区の80%の農家が、栽培管理に対する支援サービス提供を評価し、81%の農家が組合管理に関する支援サービスを評価している。 3. 「灌漑農業のための技術ガイドライン」が作成された。 4. 20灌漑事業地区における農家の現状、ニーズ、改善のための課題といった情報を含むデータベースをほぼ策定した。（より正確な補足データを収集中）なお、営農システム改善のためのニーズと活動が、農民参加型ワークショップを通じて確認され、戦略としてまとめられる一方、行動計画の実施につながっている。

Effectiveness (continued)

	Questions	日本人専門家4名の回答				C/P20名の回答				スキーム・マネージャー 20名の回答				農民代表20名の回答				
		A	B	C	無回答	A	B	C	無回答	A	B	C	無回答	A	B	C	無回答	
	How much do you evaluate following assumptions arose on, or affected for project purpose?	A: Greatly arose/affected, B: Partly arose/affected, C: Less arose/affected																
37	Assumptions to achieve the Project Purpose	a. All stakeholders commit the program for Overall Goal.	3	1			12	5	1	2								
38		b. Function of irrigation schemes are maintained.	3		1		8	6	3	3								
39		c. Marketing of produce improves.		4			4	9	3	4								
40		d. GIDA staff and farmers apply the contents of the guidelines.	1	3			12	3	2	3								
41		e. Counterparts continue to work with GIDA.	1	3			8	6	3	3								
42	Other than above factors, were there any negative factors that badly affected for proceeding the project after May 2002?																	

Impact: Positive and negative effects by implementing the project that include unexpected effects

	Questions	日本人専門家4名の回答				C/P20名の回答				スキーム・マネージャー 20名の回答				農民代表20名の回答			
		A	B	C	無回答	A	B	C	無回答	A	B	C	無回答	A	B	C	無回答
		A: Fully achieved, B: Partly achieved, C: Not achieved so much															
43	How much do you evaluate the overall goal was achieved? Overall Goal: Farming system in all irrigation schemes under GIDA are improved.		4			4	13	3		7	9	4		2	14	4	
	As results by implementing the project, do you observe any <u>unexpected</u> positive or negative impacts have arisen?	A: Greatly arose, B: Partly arose, C: Less arose															
44	Policy aspect		3		1	6	6	7	1	9	4	5	2	10	4	4	2
45	Technical aspect		2	1	1	6	5	7	2	7	9	2	2	7	8	3	2
46	Environmental aspect		2	1	1	2	5	11	2	4	7	6	3	4	3	10	3
47	Social or cultural aspect		2	1	1	4	3	11	2	7	4	7	2	6	4	7	3
48	Institutional aspect		2	1	1	4	4	10	2	10	7	1	2	6	7	3	4
49	Economic or financial aspect		2	1	1	4	9	5	2	8	7	4	1	4	8	5	3

Relevance: Conformity of the overall goal to the present national policy and conformity of the project purpose to the present needs of the project operation units/beneficiaries

		Questions	日本人専門家4名の回答				C/P20名の回答				スキーム・マネージャー 20名の回答				農民代表20名の回答			
			A	B	C	無回答	A	B	C	無回答	A	B	C	無回答	A	B	C	無回答
			A: Totally relevant, B: Partly relevant, C: Less relevant															
50		Does the overall goal still conform to the present agriculture policy of the Ghana Government? "Farming system in all irrigation schemes under GIDA are improved."	4				19	1			15	4	1		13	5	1	1
51		Does the project purpose still conform to the present needs of the project operation units/beneficiaries? "Farming system in all irrigation schemes under GIDA are improved."	4				19	1			17	2	1		11	7	2	

Sustainability: In the post project stage, how the project benefits can be sustained?

	Questions	日本人専門家4名の回答				C/P20名の回答				スキーム・マネージャー 20名の回答				農民代表20名の回答			
		A	B	C	無回答	A	B	C	無回答	A	B	C	無回答	A	B	C	無回答
	How the improved farming system in all irrigation schemes under GIDA can be sustained?	A: Mostly provable, B: Partly provable, C: Less provable															
52	By improving institutional capabilities of GIDA (IDC)	2	2			14	5	1		17	2	1		12	7		1
53	By improving financial capabilities of GIDA (IDC)	1	2	1		13	2	5		13	5	2		12	5	2	1
54	By improving personnel affairs of GIDA (IDC)	2	2			8	10	2		10	8	1	1	11	6	2	1
55	By building more technical and management capabilities of farmers	4				14	6			12	7	1		13	4	2	1
56	By providing farmers with enough facilities and equipment	1	2	1		7	9	3	1	14	4	2		15	2	2	1
57	By providing farmers with financial assistance	1	2	1		6	8	6		13	5	1	1	14	3	2	1
58	Please list up any other measures than the above, if you have more feasible ones for sustaining project benefits.	/				/				/				/			
59	Can you manage to remedy malfunctions of the machinery or equipment under your duties in GIDA?			2	2	10	5	2	3	7	8	3	2	8	5	3	4
60	Can you plan and prepare for a training program (curriculum, lecture note and other training materials) on your part of the appropriate farming system when asked to hold a seminar for extension workers or farmers in the Ashaiman, Okyereko or similar areas?	1	1		2	15	3		2	12	5		3	5	7	4	4

付属資料 6 戦略実施状況： 戦略に含まれる行動計画の実施とその成果の現状

(各地区のスキームマネージャーあるいは農民代表からの回答に基づく。2004年5月末現在)

No.	灌漑事業 地区名	行動計画実施による成果 (注：短期の行動計画は、2003年3月～5月に実施。 長期の行動計画は、2003年から2005年にかけて実施する事業計画)
1	Ashaiman	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 水稻栽培に手押し除草機を取り入れ、栽培コスト削減に寄与。除草機は簡易で利用しやすい。多くの農家を使い始めている。 ● 化学肥料に変えて、有機肥料の利用を始めた。それにより、収量増加と生産コストの低減に大きな効果があった。 ● 適切な栽培ローテーションを取り入れ、病虫害被害の低減や作物の健康度改善につながった。 ● 以上の結果、収入が2.5万セディから5.0万セディに増加した。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 本プロジェクトの支援のもと、米種子栽培農家4戸とokra種子栽培農家1戸への研修が実施され、良質の種子が生産され、農家はそれを手に入れることができるようになった。 ● District Cooperative Officer が、農民を対象に、組合管理に関する研修を実施した。それにより、農民は、組合活動に参加する必要性を認識するようになった。 ● NGOに灌漑施設管理に必要な資金的支援を要請した。灌漑面積増加による食糧生産増加が期待される。
2	Dawhenya	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 塩類集積農地の排水改善により、約3haの農地を作物栽培に利用。 ● 米乾燥床の除草、ひび割れ部分の修復といったメンテナンスを毎月実施。 ● 米の品質改善のため、80%の農家が米の優良品種(2品種)を取り入れている。そして、種子選別、苗の移植といった技術を取り入れている。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● エネルギー消費量節減のため老朽化したポンプを、村落インフラプロジェクトにより、風力ポンプに取り替える計画が進行中。 ● 耐塩性の米品種の選定について灌漑開発センター(IDC)と相談中。 ● マーケットのニーズに応じた高品質の米を生産するため、優良な精米所を利用している。 ● 土壌肥沃度向上のため有機肥料(鶏糞や牛糞)を利用する農家が約40%になっている。
3	Kpong	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 米収量が4t/haから8t/haへ増加した。 ● 農業機械のメンテナンスが実施されている。 ● 登録料支払いや会費支払いについての教育を農民が受けている。 ● 農民の51%がすでに登録し(農民組合)、登録推進プログラムは継続中。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 米生産に関する指導者訓練と組合管理研修が実施された。 ● ローン回収を行う作業グループが作られ、前作期には、22,000の米袋が回収された。 ● 情報伝達のための道具として、KIPから車輛とコンピュータの提供を受けた。
4	Weija	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 幹線水路の除草や土砂除去等のメンテナンスにより、灌漑施設の継続的・長期的利用を実現する。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 農民はいつでも灌漑施設のメンテナンスをする準備ができている。 ● 農民は、組合の意味と利益を理解するようになってきている。 ● 農民は、研修機会を利用することにより積極的である。
5	Afife	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 水路のメンテと水管理が良くなったことで、2003年の作期には、米の収量が4.2t/haから6.2t/haも増加した。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 収量増加により、農民の所得が増加した。そして水利費の徴収率が改善した。 ● マーケティング改善として、Afifeの米の需要が大幅に増加した。精米での販売価格が、一袋あたり17万セディから25万セディに上がった(一袋は50kg)。前作期の収穫物は全て販売できた。 ● 農民組織強化については、選挙が実施され、農産物のマーケティングを支援する女性グループが作られ、農民は共同作業に積極的に参加し、水利費徴収率は改善している。

6	Aveyime	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 農民達は、各自の責任について認識を持つようになった。 ● 銀行に預金する習慣が身に付いた。
7	Kpando-Torkor	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 農民からポンプ代金の10%に相当する資金を集め、銀行口座に資金を預け、VIP(Village Infrastructure Project)へ申請した。しかし、VIPの業務上の問題から、より大型のポンプを購入するための資金提供がまだ得られていない。そのため、灌漑面積を増加させることができていない。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 既存のポンプの修理とメンテナンスを実施した。 ● 新規の作物栽培では、栽培カレンダーに沿った栽培を行っている。 ● その他、有機肥料の利用、組合組織に関する研修受講、四半期毎の集会実施、マーケティング委員会の強化等の活動により、前回の収穫では、農産物の良い市場が得られた。そして、農民の収入は、以前に比べて2倍となった。
8	Mankessim	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 新規の道路が建設された。 ● 組合組織の活性化として、選挙により新しい幹部が選出された。また、2つの銀行に口座が開設された。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 有機肥料造りとその利用により土壌肥沃度の改善が図られ、その結果スイカの収量が45%増加した。 ● 農民からの資金集めができるようになったことで、組合はGhana Federation of LaborやDistrict Assembleからスプリンクラー機器更新のための資金支援を獲得することができた。
9	Okyereko	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 収穫前に市場調査を行うことで、マーケティングが改善。 ● 適期に除草することで、コメの品質向上。 ● 排水路をきれいにすることで、病虫害被害を軽減。 ● 互助制度を行うことで、収穫作業にかかる費用を低減。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 水管理改善。 ● 優良種子利用により米の品質向上。 ● 肥料造りの研修を受講し、土壌肥沃度改善。 ● 除草機使用により、除草作業時間の減少と生産コストの低減。 ● 防虫用のニームの作り方と適切な栽培技術に関する研修を受講し、栽培技術が向上。 ● 耐塩性品種、水流による塩分除去、排水改善により塩類集積圃場での生産改善。
10	Subinja	<ul style="list-style-type: none"> ● 貯水池の除草と土砂除去を実施済。District Cooperative Officerを招いて集中的な教育を受講した。そして、組合登録を申請し、登録証明書を受領した。 ● ポンプ1台の利用を開始し、パイプを敷設し、新しいバッテリーを購入した。
11	Tanoso	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 貯水池に通じる幹線農道の修復が実施された。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● オクラの収量増加。 ● 組合はかなり強化された。また、集会への参加状況も良い。共同作業の精神が高まったことと、支払いが早くなったこと。 ● 雨期の穀物栽培が増加した。 ● 作物多様化として、雨期のキャベツ栽培が始まった。
12	Sata	(都合により、回答できず)
13	Akumandan	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 幹線農道の改修とカルバート設置を完了し、アクセス改善により、農産物を容易に運搬できるようになった。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 灌漑施設改善として、新規に2台の電動ポンプを購入した(3.7万ドル)。 ● 組合強化として、選挙を実施し、各種の小委員会を設置した。組合の講座を銀行に開設し、月2回の定期集会を実施している。
14	Anum Valley	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> ● 農民組合で選挙が実施され、新しい幹部が選出された。 ● 幹線水路、支線水路、排水路の土砂除去が実施された。 ● ポンプ場地点の改修実施。

		<p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 米収量は、3.2t/ha から 4.0t/ha に増加した (2003 年の作期) 灌漑施設の定期的なメンテナンスを実施した。 定期的な一般農民集会を開き、農民が参加し、徐々に組合精神が浸透している。 組合は、米のバッキングのために必要な発電機を購入した。
15	Amate	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 組合のリーダーは、その役割を演じ、組合メンバー全員に対する指導をしている。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 灌漑による栽培が開始された。 組合活動への参加度が高くなった。
16	Dedeso	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 乾期作実施前に農道の穴埋めや除草作業を実施することで、オクラの収穫のため車で圃場に近づくことが可能となり、また女性が市場に出荷することが可能となった。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 強力なマーケティング委員会が構築されたことで、オクラのマーケティングが改善した。
17	Kikam	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 農民集会を実施。 組合の概念についての研修を、Cooperative Officer に申込み、研修を実施した。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 弱かった組合を強化中。
18	Bontanga	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 本プロジェクトによる研修により、組合活動に対する農民の興味が増加している。そして、集会への参加も良くなり、有意義な討議が行われている。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 農産物の品質向上のため、認証された米種子を食糧農業省から調達している (GR18)。また、農民は本プロジェクトによる玉ネギ種子の生産についての研修を受講している。
19	Golinga	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 水路の土砂除去実施により、水がスムーズに水路を流れるようになり、男性達の共同作業の精神を高めることとなった。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 大量の投入材を購入することで、コスト低減につながった。 食糧安全保障特別プログラムからクレジット支援を受け、農民の生産意欲を高めた。 種子研究所 (SARI) から米の高収量品種の種子を得られた。
20	Libga	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 共同作業で水路の除草を行った結果、水路にスムーズな水の流れがある。 農民組合の新しい幹部が選出され、組合が強化された。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 投入材を大量に購入することで、投入材のコスト低減になった。 有機肥料を使用することで、圃場の肥沃度が改善した。 灌漑可能な面積が増加した。
21	Tono	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 組合組織の構築として、28 グループが農作業のためのクレジット提供を受けた。 圃場の塩分問題を改善するため、排水路の改善を農民が実施。 圃場内の水管理改善と雑草管理のため、土地の均平化を実施。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 収量増加に関しては、2003 年雨期の米収量は 3.2t/ha (面積 875ha)、乾期の収量は 3.4t/ha (669ha) (目標は、2005 年までに 3.0t/ha から 5.0t/ha に増加させること。) 農産物の販売価格を交渉するためのマーケティング委員会が作られた。米の購入業者 2 社 (CCTC と FKE) を見つけた。
22	Veal	<p>(短期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 水利費徴収はグループリーダーが担当するように変更したことで、個別に徴収していた頃に比べて、モニタリングしやすくなった。 <p>(長期の行動計画実施の効果)</p> <ul style="list-style-type: none"> 農民組織強化を継続中。農民間の連帯が強くなった。

付属資料 7 収集文献、資料一覧

No.	資料名	発行
1	Food & Agriculture Sector Development Policy (FASDEP) , September 2002	Ministry of Food and Agriculture
2	Agriculture Strategic Plan for Ghana 2003-2005, Volume One : Main Report, May 2003	Ministry of Food and Agriculture
3	Technical Guidelines for Irrigated Agriculture, March 2004, Small Scale Irrigated Agriculture Promotion Project- Follow Up	GIDA & JICA
4	Strategies for Effective Utilization of Existing Irrigation Projects, March 2004, Small Scale Irrigated Agriculture Promotion Project- Follow Up	GIDA & JICA
5	An overview of SSIAPP and SSIAPP Follow-Up towards development and sustainable irrigated crop production, a paper presented by Mr. Sammy M. Akagbor, (Director, OPD, GIDA)	GIDA & JICA
6	The way forward in Ghana, with farmers' participation, for sustainable irrigation management. An Analysis of the present situation and recommendations, paper presented by Dr. Narihida Nagayo, Chief Advisor of SSIAPP-FU	GIDA & JICA

Report On

**EVALUATION OF THE IMPACT OF THE
SMALL SCALE IRRIGATED AGRICULTURE PROMOTION
PROJECT FOLLOW-UP (SSIAPP-FU)**

Prepared For

**SMALL SCALE IRRIGATED AGRICULTURE
PROMOTION PROJECT**

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1.0 INTRODUCTION

1.1 Scope of Report

This report is on the Impact Assessment of the Small-scale Irrigated Agriculture Promotion Project Follow-Up (SSIAPP-FU), which was implemented by the Ghana Irrigation Development Agency (GIDA) and the Japan International Cooperation Agency (JICA) from 2002 to 2004.

1.2 Source of Authority

By a letter dated December 3, 2003 and discussions between the Management Development and Productivity Institute (MDPI) and Dr. Narihida Nagayo, the Chief Advisor for the SSIAPP-FU, the MDPI was awarded a contract to assess the Impact of the SSIAPP-FU.

1.3 Terms of Reference

The assignment requires a general survey of the present farming situation in the model projects of Ashaiman and Okyereko. In addition, the third party evaluation assignment was to assess the impact of the SSIAPP-FU on three selected irrigation projects (Bontanga, Tanoso and Afife) that did not benefit from the SSIAPP main phase during its implementation period (1997 to 2002).

1.3.1 Task I

Evaluation of the project activities based on the Project Design Matrix (PDM)

This task has four outputs as follows:

1.3.1.1 Output 1

Check the accomplishment level of the improvement of farming system in Ashaiman irrigation scheme through the evaluation of the appreciation level of Ashaiman farmers regarding the farming system introduced and supported by SSIAPP-FU.

1.3.1.2 Output 2

Check the accomplishment level of improvement of farming system in Okyereko irrigation scheme through the evaluation of the appreciation level of Okyereko farmers regarding the farming system introduced and supported by SSIAPP-FU.

This output has two sub-outputs as follows:

- A survey of the tendency of income of Okyereko farmers in the SSIAPP-FU period; and
- An establishment of the appreciation level of Okyereko farmers regarding the contents of the Technical Guidance on crop management and management of cooperative societies under the SSIAPP-FU.

1.3.1.3 Output 3

This output is to check the accomplishment level of clarification of the necessary technologies and methodologies for the improvement of irrigated farming system;

This was to be ascertained from the farmers and GIDA staff.

1.3.1.4 Output 4

Check the accomplishment level of identification of needs and tasks for improvement of farming systems in 20 irrigation schemes.

This output has two sub-outputs as follows:

- Check the accomplishment level of the database regarding the information of the 20 irrigation schemes; and
- Check the accomplishment level of the strategies for the improvement of irrigation farming in 20 irrigation schemes

In addition, the assignment is to check or confirm the prospective level of official approval of the Technical Guideline and the Strategy by the Joint Coordinating Committee.

1.3.2 Task II

This task involved the evaluation on the impacts and effects of the establishments and implementations of strategies (action plans) to improve irrigated farming in three-selected irrigation schemes.

This was to be done through questionnaire administration and personal interviews with beneficiary farmers and officials of GIDA.

1.3.3 Task III

This is the evaluation of the impacts and effects of the training courses and workshops organized under the SSIAPP-FU.

This was to be done through administration of questionnaire and personal interviews with beneficiary farmers and officials of GIDA

1.4 Acknowledgement

The MDPI is grateful to the GIDA and JICA for the opportunity offered it to share its expertise with them. The Institute is also grateful to the farmers, Cooperative Societies' Executives as well as the Project Managers and staff of the Bontanga, Tanoso, Afife, Okyereko and Ashaiman irrigation projects for their invaluable contribution to this report.

2.0 BACKGROUND INFORMATION

2.1 Small-scale Irrigated Agriculture Promotion Project Follow Up (SSIAPP-FU)

The Small-scale Irrigated Agriculture Promotion Project Follow-Up (SSIAPP-FU) was a follow-up on the Small-scale Irrigated Agriculture Promotion Project (SSIAPP), which was implemented from 1997 to 2002. The SSIAPP-FU therefore focused on all the twenty-two irrigated projects under GIDA.

2.2 SSIAPP-FU 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
- Beneficiary farmers of twenty-two (22) irrigation projects.

2.3 Overall Goal of SSIAPP-FU

The overall goal of SSIAPP-FU was to improve the farming systems in all irrigated schemes under GIDA.

2.4 Project Purpose

The purpose of the SSIAPP-FU was to establish the Technical Guidelines and the Strategies for improving farming systems in irrigated schemes under GIDA. The concept is in line with the GIDA strategy of farmer participation for sustainable crop production under irrigation. The project implementation is enhanced by the integration of the IDC into the Operations Department structure of the Authority in extending technologies of improved irrigation practice and training activities to cover all the irrigation projects in the country.

2.5 OUTPUTS OF SSIAPP-FU

The outputs of the SSIAPP-FU are as follows:

- Farming system in Ashaiman irrigation scheme is improved;
- Farming system in Okyereko irrigation scheme is improved;
- Necessary technologies and methodologies for improvement of irrigation farming systems are clarified; and
- Needs and tasks for improvement of farming systems in 20 irrigation schemes are identified.

2.6 ACTIVITIES OF SSIAPP-FU

The main activities of the SSIAPP-FU are to:

- Improve farming system at the Ashaiman irrigation scheme
 - Monitoring operation of farming support services
 - Advising on the improvement of farming support services
- Improve farming system in the Okyereko irrigation scheme
 - Providing guidance on crop management
 - Providing guidance on management of cooperatives
- Clarify technologies and methodologies for the improvement of farming systems
 - Screen the outputs from five-year cooperation period;
 - Monitor farming systems in Ashaiman and Okyereko irrigation schemes;
 - Add necessary technologies and methodologies
- Identify needs and tasks of improvement of farming systems in 20 irrigated schemes
 - Collect additional data from workshops and training courses
 - Create a database

2.7 OBJECTIVELY VERIFIABLE INDICATORS OF SSIAPP-FU

- a) More than eighty percent (80%) of farmers in Ashaiman appreciate the farming support systems.
- b) Income from irrigation farming in Okyereko is increased in follow-up period
- c) More than eighty percent (80%) of the farmers in Okyereko appreciate the contents of guidance on crop management and management of cooperative
- d) A guideline for the improvement of irrigation farming systems is established
- e) A database including information such as farmer's situations, needs and tasks for improvement is prepared for 20 irrigation schemes.

2.8 IMPLEMENTING AGENCIES AND EXPERTISE ON SSIAPP-FU

- a) Ghana Irrigation Development Agency (GIDA); and
- b) Japan International Cooperation Agency (JICA).

3.0 METHODOLOGY OF STUDY

To enable the study team have a meaningful basis for assessing the impact of the project on the major stakeholders, a three-stage approach was adopted namely:

- Preparatory stage;
- Processing stage; and
- Study outcome

3.1 Preparatory stage

This involved the collection, study and analysis of all relevant materials needed for the success of the assignment (desk-top research)

3.2 Processing stage

This stage involved

- Questionnaire design
- Questionnaire administration and collation
- Direct interaction with farmers, project managers and executive members of the five selected cooperative societies (focused group discussions).
- Analysis of administered questionnaires (respondents' responses)

3.3 Coverage of study

Out of the 22 irrigation projects under GIDA, five projects were selected for the study. Ashaiman and Okyereko projects were selected because they were model projects whose operations needed to be enhanced under the SSIAPP-FU. Three other irrigation projects were chosen from the three major agro-ecological zones of Ghana. These were:

- Bontanga from the Northern Savannah area;
- Tanoso from the transitional/forest zone; and
- Afife from the coastal savannah.

The selection of the three projects was to ensure that the impact of weather variations on irrigated agriculture farming reflected in the evaluation results.

The sample size for the Ashaiman and Okyereko projects consisted of all the farmers at these projects. On the other hand, the sample sizes for the three selected projects; Bontanga, Tanoso, and Afife was from among those farmers who participated in the activities of the SSIAPP-FU (Table 1).

Table 1. Numbers Of Farmers Interviewed on the Selected Projects

	Irrigation Project	Sample Size	No. of Samples	Response Rate (%)
1	Bontanga	50	38	76
2	Tanoso	50	43	86
3	Afife	75	60	80
4	Ashaiman	100	77	77
5	Okyereko	96	59	61
	Total	371	277	74.7

Source: Field Survey, February 2004.

Of the three hundred and seventy-one (371) farmers that were to respond to the questionnaire administered, two hundred and seventy-seven (277) farmers were interviewed. This represents over seventy-four percent (74.7%) response rate.

Generally, the low response rate to the questionnaire administered was due primarily to questionnaire fatigue of the respondents. According to the farmers, researchers from the universities, research institutions, Ministry of Food and Agriculture, Non-Governmental Organizations, etc subject them to interviews and questionnaire administrations very often. It appears that the farmers are losing interest in research work because they claim that the results and outcome of the studies do not benefit them nor even communicated to them. This evaluation was therefore seen as one of such researches even though efforts were made to explain the rationale for this evaluation.

Specifically, the main reasons for the lower than expected response rates for Ashaiman and Okyereko are as follows:

Ashaiman

- Twenty-three percent (23%) of the respondents were old (above 60 years of age) who had attended various training programs but were not available to answer the questionnaire because they had rented their land to tenant farmers. These tenant farmers could not adequately respond to the questions because they have not benefited from the training courses.

These tenant farmers are not even recognized by the Cooperative Society, hence they could not benefit from the services provided by the Cooperative Society for farmers on the project.

- The farmers had adopted lukewarm attitudes towards external officials conducting research because in most cases the

outcomes of the studies are not made available to them and they do not seem to benefit from such interviews.

Okyereko

- The evaluation was conducted at a time that the farmers were not cropping because of the low level of water in the dam for which reason, most of the farmers had traveled outside Okyereko. This adversely affected a full survey of all the farmers.

3.4 Study outcome

This involved the preparation of the draft and final draft reports and the subsequent presentation to the client (JICA/GIDA).

4.0 RESULTS & FINDINGS OF THE EXPECTED OUTPUTS OF THE SSIAPP-FU EVALUATION BASED ON THE EVALUATION OF OBJECTIVELY VERIFIABLE INDICATOR.

4.1 Expected output

Farming system in Ashaiman irrigation scheme is improved.

Objectively verifiable indicator:

More than eighty percent (80%) of farmers in Ashaiman irrigation scheme appreciate the farming support systems.

Table 2 shows how the respondent farmers at Ashaiman rated the various support services provided under the SSIAPP-FU.

Table 2 Support Services Provided Under SSIAPP-FU Programme

Support Service	High	Average	Low	Very Low
The Co-operative System	39	55	3	3
Extension Services	43	45	11	1
Irrigation water management	77	20	2	1
Use of Agric. Machinery	51	32	14	3
Total	210	152	30	8
Mean	52.5	38	7.5	2

Source: Field Survey, February 2004.

On the average, ninety and a half percent (**90.5%**) of the respondent farmers at the Ashaiman project rated the support services provided under the SSIAPP-FU as average to high (Table 2).

As a result of the successful operation of the above services, the farmers Cooperative Society at Ashaiman has developed capacities in providing additional support services to the farmers.

Table 3 shows the respondent farmers' rating of the support services provided by the Ashaiman Cooperative Society:

Table 3. Additional Support Services

Support Service	High	Average	Low	Very Low
Credit Facilities	39	54	4	3
Farm Inputs	50	48	1	1
Maintenance of Agric Machinery	30	44	21	5
Total	119	146	26	9
Mean	39.67	48.67	8.67	3

Source: Field Survey, February 2004.

From table 3, eighty-eight percent (88%) of the respondent farmers at Ashaiman rated the additional support services provided by the farmers' cooperative society as average to high.

The percentage rating of evaluation on the irrigation management system during the SSIAPP-FU at Ashaiman is presented in table 4.

Table 4. Evaluation on The Irrigation Management System At Ashaiman (%)

SYSTEM	Very Good	Good	Fair	Poor
Water Availability	88	9	3	0
Water supply scheduling	70	24	4	2
Maintenance of irrigation facilities	43	42	14	1
Total	201	75	21	3
MEAN	67	25	7	1

Source: Field Survey, February 2004.

From table 4, ninety-two percent (92%) of the respondent farmers at the Ashaiman Irrigation System think that the SSIAPP-FU is at least good project. In other words, only eight percent (8%) of the respondent farmers at Ashaiman indicated that the irrigation management system is fair to poor.

4.2 Expected Output

Farming system in Okyereko irrigation scheme is improved.

4.2.1 Objectively verifiable Indicator

Income from irrigation farming in Okyereko is increased in SSIAPP-FU period.

Table 5 below shows an indication of the respondent farmers from Okyereko as to whether their income from irrigated farming improved or not during the SSIAPP-FU.

Table 5. Impact of SSIAPP-FU on Income at Okyereko

Response	Score	%
Income improved	33	56
Income not improved	26	44
Total	59	100

Source: Field Survey, February 2004.

Table 6 depicts how the respondent farmers at Okyereko evaluated their standards of living as of now as compared with their standards of living before the SSIAPP-FU.

Table 6. Impact of SSIAPP-FU on Standard of Living at Okyereko

Response	Score	%
Much better	9	15
Just Better	38	64
The same	11	19
Worse	1	2
Can't tell	0	0
Total	59	100

Source: Field Survey, February 2004.

From Table 5, fifty-six percent (56%) of the respondent farmers at Okyereko were of the view that their income had increased as a result of the implementation of the SSIAPP-FU, while forty-four percent (44%) of the respondent farmers indicated that there had been no increase in their income. Seventy-nine percent of the respondents (79%) indicated that their standard of living had become better as a result of the SSIAPP-FU.

The reasons given by respondents for indicating an improvement in their standards of living but not a corresponding increase in their income from irrigated farming as a result of SSIAPP-FU are that although the farming has resulted in better and increased quantities of food in the homes, better health for their families, they did not feel increased incomes in their pockets. The contradiction between income increase and standard of living is due to the fact that availability of food at home is recognized as improved standard of living but not an increase in income, forgetting that they would otherwise have to use money to buy food for their homes.

By inference therefore, the majority of the respondent farmers at Okyereko are of the view that their income and standard of living had improved as a result of the SSIAPP-FU.

From Table 5, forty-four percent of the respondents (44%) who noted that their income had not improved under the SSIAPP-FU, attributed this to the following:

- a) Some of the farms were not easy to irrigate because of poor leveling.
- b) Some canals and laterals needed to be rehabilitated to carry sufficient water for all the farms that they serve.

- c) The high salinity level of some of the farms adversely affected the crop yields.
- d) The costs of farm services (such as weed control, harvesting and threshing) and the prices of inputs (such as agro-chemicals) kept rising without a corresponding increase in the market prices of farm produce (especially rice).

4.2.2 Objectively verifiable indicator

More than eighty percent (80%) of the farmers in Okyereko appreciate the contents of guidance on crop management and management of Cooperative Societies.

Below is Table 7 indicating how the farmers at Okyereko rated the intervention of the SSIAPP-FU using the guidance on crop management and management of the Cooperative Society:

Table 7. Rating of SSIAPP-FU Intervention at Okyereko Irrigation Project on crop management and management of the cooperative society.

	No.	%
High	34	58
Medium	23	39
Low	2	3
Very Low	0	0
Total	59	100

Source: Field Survey, February 2004.

Ninety-seven percent (97%) of respondent farmers rated the intervention of SSIAPP-FU through the guidance on crop management and management of Cooperative Societies as medium to high. However, only three percent (3%) of the farmers at Okyereko rated the SSIAPP-FU intervention was low. This shows that, on the whole the intervention of the SSIAPP-FU is highly appreciated by the majority of the respondent farmers at Okyereko.

Table 8 below indicates the level of satisfaction of the farmers at Okyereko in respect of the intervention of the SSIAPP-FU on the whole.

Table 8. Level of Satisfaction with SSIAPP-FU Intervention at Okyereko

Level of Satisfaction	No.	%
Highly	41	69
Averagely	17	29
Lowly	1	2
Not satisfied at all	0	0
Total	59	100

Source: Field Survey, February 2004.

From Table 8, ninety-eight percent (98%) of respondent farmers indicated their satisfaction with SSIAPP-FU as a whole to be average to high. The study revealed that none of the respondents was dissatisfied with the SSIAPP-FU.

Table 9 below depicts the level of appreciation by respondent farmers at Okyereko about the contents of the guidance on crop management and management of Cooperatives Societies under the SSIAPP-FU in response to the question “ Have you benefited from the SSIAPP-FU in relation to the listed support services”:

Table 9. Appreciation Level on Crop and Cooperative Management at Okyereko

Area of Assessment	Level of appreciation	
	% YES	% NO
Crop management	98	2
Management of Cooperatives	97	3

Source: Field Survey, February 2004.

From Table 9, ninety-eight percent (98%) of the respondent farmers appreciate the contents of the guidance on crop management while ninety-seven percent (97%) of them appreciated the guidance for the Management of Cooperative Societies.

4.3 Expected Output

Necessary technologies and methodologies for improvement of irrigation farming systems are clarified.

4.3.1 Objectively Verifiable Indicators

A guideline for improvement of irrigation farming system is established.

Interviews with the project implementers and the farmers revealed that, GIDA in consultation with the farmers' Cooperative Societies of all the twenty-two (22) irrigation projects developed Technical Guidelines

on vegetable and rice production, water management, farm management, extension services, farmers' organizations and the use of agricultural machinery.

The Technical Guidelines cover all the basic agronomic, operations as well as management practices that the farmers need to improve upon their crop yields and increase their income levels. The contents are detailed and some of the materials are presented in pictorial forms that can easily be read and understood by the farmers. Similarly, areas such as Farm Management, Extension Services and the Management of farmers' Co-operative Societies are well documented.

4.4 Expected Output

Needs and tasks for improvement of farming systems in twenty (20) irrigation schemes are identified.

4.4.1 objectively verifiable indicators

A database including information such as farmer's situations, needs and tasks for improvement is prepared for twenty (20) irrigation schemes.

The study revealed that, GIDA in consultation with the farmers of the twenty projects in question, assessed their needs, identified their problems and developed strategies (long terms and short terms) to solve the identified problems aimed at upgrading their projects and improving their farming systems and income levels. The development of database for the 22 projects (including two model sites: Ashaiman and Okyereko) coupled with the Workshop on Action-Plan Orientation (WAO) have helped to change the perception of the farmers about ownership and effective management of irrigation projects in Ghana.

As a result of the change in perception, the farmers have taken initiatives for self-help activities and they have indicated their readiness towards improvement of the project.

This has resulted in the drawing up of action plans to improve the performance of the projects. The short-term strategies were activities carried out by the farmers themselves to improve their various projects. The long-term strategies were activities planned to be carried out mainly by the farmers with external assistance.

4.5 Others

4.5.1 National Workshops for Introduction of Technical Guidelines and Strategies

The Technical Guidelines and Strategies have been adequately discussed at two national workshops among the stakeholders, which are the GIDA Management, the Management and Staff of the twenty-two irrigation projects and farmers.

The Technical Guidelines and Strategies have been incorporated into the GIDA programme for the Management of the irrigation projects for the purpose of improving crop production and to ensure their sustainability. However, the formal approval of the Technical Guidelines and the Strategies are yet to be made by the GIDA.

5.0 RESULTS OF SSIAPP-FU TRAINING ACTIVITIES

The SSIAPP-FU is in two distinct forms:

- i The model projects of Ashaiman and Okyereko have been provided with the necessary resources through the SSIAPP (Institutional Building) workshops and training were designed to enhance farmers groups' capacity building in respect of management of irrigated farming projects;
- ii The other 20 schemes did not benefit from resources under SSIAPP. However, the SSIAPP-FU was meant to build capacity of farmer groups through training by creating awareness among the farmers as to their roles and responsibilities in ownership and effective management of irrigated farming projects and by teaching skills for improvement of irrigation farming.

Below is a list of new practices learnt by farmers resulting from the SSIAPP-FU training as revealed by the farmers interviewed at the five selected projects:

5.1 Seed Acquisition

As a result of training under the SSIAPP-FU, farmers are now able to select quality seeds from their own produce for cropping in the succeeding season and for propagation at their nurseries. Where the need arises, they are able to purchase quality seeds from recommended seed and agro chemical shops. This has led to improved farm yields.

5.2 Cultivation Practices

Farmers now use appropriate weedicides for the control of weeds and this has minimized the costs associated with the maintenance of farms. Cultivation practices such as hand picking of weeds, fertilizer applications, spraying of chemicals against crop pests, etc are now easier as a result of row planting, which was introduced under SSIAPP-FU. However, prior to the SSIAPP-FU, most of the respondent farmers broadcasted their seeds, which they claimed impeded some of the cultural farming practices.

5.3 Harvesting Practices

As a result of row cropping, identification of matured crops for harvesting in general are easier now. Farmers now harvest early and thereby are able to minimize losses.

5.4 Marketing of Crop Produce

With the formation of the Cooperative Societies and the Sub-Committee on marketing, marketing of farm produce has become very smooth and easy. However direct sale of the vegetables to middlemen and market-women is still in practice at Ashaiman especially by tenant farmers, because the Cooperative Society does not want to handle the marketing of vegetables as these are easily perishable.

5.5 Financing of farming activities

The co-operative societies are now very actively involved in sourcing and/or guaranteeing loans for the farmers. This has however been concentrated on the rice farmers leaving out vegetable crops growers. This is because the societies' executive members supervise the rice sales and the farmers do repay their loans in kind to the Co-operative Societies, which in turn pay to the financial institutions.

5.6 Reasons Given For Various Responses

5.6.1 Reasons given for improved income;

- The new ideas acquired through the training;
- The use of quality seed and good cultural practices;
- Timely application of fertilizer;
- Proper farm maintenance;
- Good land preparation;
- High yield through the application of manure;
- The system of crop rotation;
- Patch burning instead of mass burning; and
- Timely planting, weeding and spraying against crop pests and diseases enhance early crop establishment and development, which results in high crop yields.

5.6.1.1 Reduction in input costs

The use of animal manure instead of inorganic fertilizer to enhance the fertility of the soil, and the use of neem tree extracts for the control of insect pests instead of insecticides have greatly reduced input costs.

5.6.1.2 Marketing of produce

At Tanoso and Afife for example, the Cooperative Societies are very influential in the marketing of farm produce. There is the Sub-Committee on Marketing, which is responsible for the marketing arrangements of the produce. The Committee advertises on the local FM stations (Techiman and Volta Star FM) and negotiates prices with buyers on behalf of the farmers.

This method safeguards the farmers from being cheated by market women.

5.6.2 Reasons given for not achieving improved income;

- i. Increased costs of inputs.
- ii. Low prices of farm produce,
- iii. The market women who pre-finance the farming operations dictate the prices of produce to be bought by them;
- iv. Inability to mill paddy rice on project site due to unavailability of a mill as in the case of Okyereko.

Judging from 5.6.2 above, it seems that some farmers have not entirely adopted the improved cultural practices that were introduced under the SSIAPP-FU. It also appears that some farmers are not fully cooperating with the Cooperative Sub-Committee on marketing.

5.6.3 Reasons advanced by respondent farmers for hailing the intervention of SSIAPP-FU

- Improved irrigated crop husbandry practices, skills and techniques have been introduced under the SSIAPP-FU;
- Higher yields following the adoption of the improved husbandry skills and techniques;
- Proper understanding of the irrigation concept;
- The role of the farmer and the cooperative concept in sustainable irrigation management were explicitly explained to farmers and some are adhering to the roles expected of them;
- The ability of farmers to propagate their own seeds from their nursery sites;
- The ability of farmers to decide on where to cut down crop production costs;
- Welfare of farmers is catered for by the Cooperative Societies;
- Maintenance of farms, laterals, canals and bunds;
- Effective water scheduling at the irrigation sites;
- Change in attitude of some farmers towards high communal labour among themselves;
- High quality of crop produce; and
- Attractive and stable prices as a result of the crop marketing strategy adopted by the societies' members.

5.6.3.1 Benefit of training to farmers

All respondent farmers indicated that they have benefited tremendously from the training / workshops conducted under the SSIAPP-FU. The respondents considered the training / workshops as:

- An "Eye Opener" to irrigated farming;

- Having enhanced their team work, love and unity among farmers, that is high communal spirit;
- Farmers acquired the skills and knowledge to determine the cost-effectiveness of their farming operations, that is being able to determine the level of profitability or losses;
- Enhancing a high membership drive for the Co-operative societies;
- Having engendered a sense of ownership of the projects among themselves;
- Having helped to explain the role of the Cooperative Societies; and
- Having enhanced farm management practices of the farmers.

5.6.4 Reasons for “no satisfaction” with the SSIAPP-FU

Some farmers interviewed observed that they could not adopt the improved husbandry practices and skills acquired during the training/workshop because of financial constraints. They said they could not raise enough money themselves and also was equally difficult accessing loans from both the formal and informal sources.

5.6.5 Reasons given for the indication of their improved standard of living as a result of SSIAPP-FU

The respondent farmers have a variety of ways of assessing he improvement in their standard of living as a result of he SSIAPP-FU. Some of the factors used are as follows:

5.6.5.1 Shelter

Some farmers have been able to rehabilitated their housing units (accommodation) and others have been able to buy plots of land in urban areas.

5.6.6.2 Food

Most farmers indicated the availability of food in the house at all times both in quantity and quality as a measure of their improved standard of living.

5.6.5.2 Material wealth

Some farmers are now able to buy new clothes for themselves, their spouses and children.

5.6.5.4 Health

Many of the farmers indicated that they are now able to afford good health care services for themselves and for their families.

5.6.5.5 Savings

Some respondent farmers at Bontanga and Tanoso have saving deposits with the rural banks and are always ready (in terms of working capital) for the next cropping season and for emergencies that may occur.

5.6.5.6 Children's education

Many farmers are now able to pay the school fees of their wards, buy their books, uniforms and pay all levies imposed on their wards. Some have also bought bicycles for the kids as their means of transport to school.

5.6.5.7 Entertainment

Response farmers indicated that they have been able to acquire TV sets, radio sets, and are able to regularly attend social gatherings and meet their social obligations in terms of monetary contributions. One respondent farmer at Bontanga simply said, "Now there is peace in my house."

5.6.5.8 Other investments

- Some respondent farmers at Bontanga said they have invested in cattle or other livestock.
- Another has bought a corn mill

5.6.6 Reasons for "hailing" Government efforts at improving irrigated farming

- The invitation of a donor country (Japan) to assist in improving irrigated farming in Ghana; and
- The establishment of the project infrastructure – offices, dam, canals, laterals, plots for cropping, agricultural machinery, etc.

5.6.7 Reasons for "not hailing" Government efforts at improving irrigated farming

- There is a shortage of land preparation equipment at all the projects and the government does not seem to be making efforts to improve the situation;
- Requested credit facilities made to the appropriate authorities have not yet materialized;
- Lack of subsidies on farm inputs;
- The government needs to be involved in the marketing of the farm produce, especially rice, which has a lot of competition from imported varieties;

- Most irrigation projects need urgent expansion and this must come from the Government;
- There is the urgent need for extra pumps and sprinklers at Tanoso, a request to Government has not yet yielded any response; and
- Request for farm inputs and electricity bill subsidy has not materialized.

Analysis of subsections 5.6.6 and 5.6.7 show that the farmers still display some tendencies of dependence on government for support notwithstanding their change in attitude to manage the irrigated projects through their own efforts.

5.7 Obstacles encountered in implementing the acquired knowledge and skills under SIIAPPF-UP

Some farmers claimed they could not implement all that they had learnt during the training organized under the SSIAPP-FU and gave the following reasons;

- Insufficient credit facility;
- High input costs;
- Insufficient agric machinery on site;
- High water service charge; and
- Misunderstandings among the farmers, leading to poor adherence to water scheduling activities.

6.0 IMPORTANT INGREDIENTS IN THE SSIAPP-FU

The tasks of the SSIAPP-FU were:

- Preparation of Technical Guidelines;
- Development and monitoring of Strategies
- Workshop for Action Plan Orientation (WAO)

Through these workshops, the farmers of all the schemes came out with the short-term objectives and action plans together with the long-term objectives and corresponding action plans;

- Organization of technical training and National Workshops

6.1 Effects of the visits of the SSIAPP-FU Officials

The visits of the SSIAPP-FU officials to the irrigation sites have resulted in:

- Confidence building among the farmers;
- Rekindling of enthusiasm and communal spirit;
- Sharing experience among farmers;
- Reminders of forgotten guidance;
- Indirect evaluation by SSIAPP-FU Officials;
- Identification of new problems on farms; and
- Advising on corrective actions (improved agricultural practices) where necessary.

7.0 OBSERVATIONS, CONCLUSIONS AND RECOMMENDATIONS

7.1 Observations

The following observations were made during the visits to the five project sites:

- Farmers do not take measurement of their harvested crops;
- The SSIAPP-FU training was good but there is room for improvement;
- Irrigation facilities at Bontanga have deteriorated and while the Tanoso project needs expansion. The farm sizes per person in both schemes are very small;
- A lot of water goes to waste especially at Bontanga
- Some project administrators are unfamiliar with details of training or workshops organized by SSIAPP-FU;
- Rice farmers manually harvest their produce;
- Vegetable farmers are exploited by middlemen;
- Much attention is given to rice farming at the expense of vegetable farming;
- Some farmers still expect much more assistance from the Government and they see the government as the owner of the projects for which reason they are passive to some programs and support services introduced by the Cooperative Societies.

7.2 Conclusions

Based on the observations above, it is concluded that:

- Farmers have problems with measurements;
- Training / workshops during SSIAPP-FU were very useful to the farmers;
- The impact of the SSIAPP-FU would have been much more felt if the farm size per farmer is increased;
- Water downstream at the project should be reused to cover other areas or recycled;
- Programs to address the needs of the Project Administrators should be developed and implemented alongside those of the farmers;
- Incomes of farmers could have increased if the dependence on market women was eliminated;
- Rice farmers are much more organized than their vegetable counterparts except for the farmers at Tanoso. This is so because the focus is on rice production;
- Farmers should be educated to embrace all programs and support services introduced by the Cooperative Societies.

7.3 Recommendations

Based on this evaluation assignment, the following recommendations are made:

- Cooperative Societies should be taught how to use weighing scales or adopt units of measurement for the sale of the farm produce
- SSIAPP-FU should continue to provide training to farmers as their numbers keep on increasing. New entrants also need to benefit from the training program;
- Irrigation facilities at Bontanga and Tanoso should be rehabilitated and expanded to cover relatively larger irrigable plots;
- Excess water on the outflow from the Bontanga project should be used to develop other areas downstream;
- Project Administrators (Bontanga) should be included in the training programs so that project reports could be properly done
- The suspended credit line which was established for the farmers at Afife with the District Assembly should be restored;
- More research into vegetable varieties should be considered.

APPENDIX I
THE COOPERATIVE SOCIETIES OF THE
IRRIGATION PROJECTS SURVEYED.

1.0 THE COOPERATIVE SOCIETIES OF THE IRRIGATION PROJECTS SURVEYED

1.1 Cooperative Development In The Irrigation Projects

1.1.1 General Background of the Societies Surveyed

The entire five irrigation project sites visited – Bontanga, Tanoso, Afife, Ashaiman and Okyereko have well-developed and organized Cooperative Societies which have been registered and certified by the Department of Cooperatives. All the respondent farmers interviewed are registered members of the five Cooperative Societies. The membership of each society has grown over the past two years and 2003 figures are depicted in Table 10.

Table 10. Year 2003 Membership of Cooperative Societies

Cooperative Society	Membership (2003)		
	Male	Female	Total
Bontanga	315	60	375
Tanoso	144	67	211
Afife	795	229	1024
Ashaiman	80	16	96
Okyereko	96	43	139
Total	1430	415	1845

Source: Field Survey, February 2004.

Executive members ranging in size from seven to eleven manage each of the Cooperative Societies and are elected democratically under the supervision of the Department of Cooperatives. The Executive members are made up of the following positions:

- President/ Chairman;
- Vice-President;
- Secretary;
- Financial secretary;
- Treasurer;
- Organizer; and
- Porter.

Interactions with the societies revealed that competent members of the Cooperative Societies have filled all these positions democratically. The five societies interviewed have constitutions and byelaws that guide members' behaviour in effective cooperative society development and management. All the Cooperative Societies have opened bank accounts with banks in their respective localities.

1.1.2 Financing

In order to generate adequate revenue for each society, members pay equity, levy and welfare dues. The amount paid varies among the societies. Tanoso Cooperative Society members pay a total levy of ¢80,000 per member per year and ¢50,000 as equity per member. At Afife, members pay ¢25,000 per year as welfare dues and ¢14,285 as levy to the traditional authority. Members at Bontanga also pay ¢5,000 as registration fees and ¢100,000 as equity per member. At Ashaiman, members pay registration fees of ¢200,000 per person, welfare dues per person per year is ¢100,000, whereas at Okyereko members pay ¢10,000 as registration fees per person, share equity of ¢50,000 per person and welfare dues of ¢50,000 after every harvest.

1.1.3 Meetings

All the Cooperative Societies hold regular meetings to discuss pertinent issues affecting their development. Executive meetings and general meetings are held separately at the conference halls at (Bontanga, Okyereko, Afife and Ashaiman) and at Tanoso under a mango tree. This implies that the Tanoso Cooperative Society has no building structure to accommodate them during their meetings. At their meetings, they record minutes which are reviewed during subsequent meetings. The officials of the Department of Cooperatives regularly participate in the meetings of the Cooperative Societies and train the members on membership registration procedures, operational matters and at the end of each financial year audit their financial statements. The five societies keep records such as record of meetings, accounts, attendance, etc.

1.2 Sub-Committees of the Cooperatives

The five societies interviewed have a number of Sub-Committees such as Agriculture, Marketing, Discipline, Welfare, Maintenance and Finance. The Sub-Committees are involved in economic and social activities for the benefit of members. The societies through the various Sub-Committees provide assistance to the members for land preparation, seed procurement and distribution, harvesting and processing of farm produce, sourcing of funds and agricultural machinery, collection of irrigation service charge, training of farmers as well as liaising with financial institutions ("Farmers Bank" for Okyereko and Ashaiman societies) to provide input credit to the members of the societies.

Besides, the societies interviewed assist the members in the event of members' hospitalization, accidents, bereavement and pay school fee for members' children or wards, etc when the need arises. The Maintenance and Disciplinary Sub-Committees perform the maintenance of the irrigation facilities and disciplinary measures respectively.

1.3. Assistance Provided by the Cooperative Societies Surveyed

The Cooperative Societies through the various Sub-Committees, provide specific assistance to the farmers in the following areas:

1.3.1 Land Preparation and Cultivation

The Agriculture Committees of the various societies organize tractors and power tiller for farmers who may decide to use services in land preparation, draw program for land preparation (cropping calendar), organize communal labour (nnoboa) for land preparation and planting of crops, and negotiate rates/ daily wage for hired labourers on behalf of the members.

1.3.2 Seed Procurement and Distribution

The Agriculture Committees procure quality seeds from research institutes such as Savannah Agricultural Research Institute, Nyankpala, near Tamale (SARI) and seed distribution agents in the respective localities and sell the seeds to farmers on credit.

1.3.3 Harvesting of Crops and Processing and Marketing of Produce.

The Agric and Marketing Sub-Committees are both involved in harvesting and processing activities. The former provides tarpaulin for harvesting, threshing and drying of rice whereas the marketing committee oversees the processing and eventual sales of all the produce, except vegetables. Nevertheless, all the respondent vegetable farmers except Tanoso scheme complained bitterly about the refusal of their societies to assist them in marketing their vegetable produce.

According to the farmers interviewed, they are always at the mercy of the middlemen who invariably buy the vegetable produce at relatively lower farm gate prices but sell the produce to the consumers at higher prices and reap high margins. This "dependency syndrome" is as a result of soft loans provided by the middlemen to the farmers.

1.3.4 Sourcing of Funds and Agricultural Machinery

The five Cooperative societies interviewed have each floated shares in a bid to increase the financial base of the societies. Thus, the farmers are encouraged to pay share capital of ₵50,000 each. Again, some of the cooperative societies interacted with are in the process of arranging for technical support and assistance in the form of crop processing equipment from other organizations in their respective localities.

At Bontanga, the society is seeking assistance and equipment in the form of corn mill from Technoserve, an International Non-Governmental Organization (NGO), whereas Okyereko society has also benefited from the District

Assembly and Village Infrastructure Project (V.I.P) through the provision of power tiller meant to enhance farmers' tillage practices. The five Cooperative Societies are also in contact with various financial institutions such as commercial banks in the case of the Bontanga, Afife and Tanoso and Farmers Bank at Okyereko and Ashaiman to provide farming inputs on credit to members of the Cooperative Societies.

1.3.5 Payment of Irrigation Service Charges (ISC)

All the five Cooperative societies have instituted Task Forces that collect the Irrigation Service Charge (ISC) from the farmers and lodge the proceeds at their respective accounts. The rate per acre varies from one society to another and is reviewed periodically.

1.3.6 Marketing of Farm Produce

The five Cooperative Societies through their Marketing Sub-Committees are actively involved in the marketing of farm produce to their clients. They advertise on the local FM stations when the crops are matured and the committee members negotiate good prices with the prospective buyers on behalf of farmers. However, according to the respondent farmers, the vegetable crops do not benefit from the good services of the cooperative societies. Thus, through the middlemen the respondent farmers are only able to dispose off their produce at a great cost to them.

1.3.7 Training of Farmers

The five Cooperative societies surveyed in collaboration with the Department of Cooperatives organize workshops for the farmers. They also have the responsibility of assembling the farmers for workshops and creating the congenial environment for effective adult teaching, learning and participation among the stakeholders. Besides, the five Cooperative Societies organize members for workshops and training conducted under the SSIAPP-FU.

The impact of the training programme and workshops organized has improved the capacity building of the societies and has manifested in the following:

- Distribution of irrigated farm fields to farmers during the onset of the cropping seasons evenly;
- Resolution of disputes among farmers;
- Contribution towards reducing poverty among irrigated farmers in the localities surveyed;
- Creation of awareness among the farmers in self-help; direct ownership and management of their projects themselves. Consequently, the farmers now expect relatively less support from other external agents or bodies towards maintenance and day-to-day administration of their projects;

1.3.8 Social Activities

In addition to the economic benefits enjoyed by the members of the various Cooperative Societies, the five Cooperative societies discharge their social responsibility by attending funerals, weddings, child naming ceremonies and visit member when they are hospitalized or injured during accident. They also pay school fees for members' wards in schools when the need arises. The five Cooperative Societies also make donation in the event of bereavement, hospitalization, accidents, child bearing, etc to affected members as mandated by their welfare policy contained in their constitutions.

1.4. Difficulties and challenges

All the five Cooperative societies enumerated some difficulties and challenges ahead and the need to overcome them to move the societies forward towards self-sustaining levels. Among others they include:

- Poor financial position;
- Illiteracy among the majority of the members;
- Members refusal to pay their share capital timely;
- Poor attendance and lateness at meetings and during communal labour activities
- High level of apathy among members during societies' communal activities;
- Deterioration of the irrigation facilities (dam, canals and furrows) especially at Tanoso, Bontanga and Afife.

To mitigate the adverse effects of the above difficulties and challenges, the Cooperative Societies have taken the following interim measures to address them:

- Encouraging all members to register and pay their share capital timely;
- Organizing more training programmes and workshops for farmers in areas of agri-business management, sustainability of projects, etc;
- Sourcing for funds and agricultural machinery and crop processing equipment for the farmers.
- Clear definition of duties and responsibilities for Executive members
- Inclusion of more women in the Sub-Committees
- Additional sub-committee to take care of adult illiteracy; and
- Requesting the GIDA to rehabilitate the Tanoso, Bontanga, and Afife irrigation projects.

1.5 Pertinent Issues Raised By The Respondent Farmers In Each of the Cooperative Society Surveyed.

1.5.1 Bontanga Cooperative Society

- A large fraction of the farmers interviewed have cultivated one acre of plot continuously for over 10 years and thus the fertility of the soil has been exhausted. This has led to low yield of crop, thus warranting heavy doses of inorganic fertilizers to enable them increase their crop yield to cover cost of farming operations;
- The number of farmers interested to crop at the irrigation site keeps on increasing yearly. In 2002 the number was 300 and at the time the survey was carried out (February 2004) the number stood at 600, representing an increase of 100% within a period of two years;
- Dam, canals, furrows and laterals have deteriorated and thus, need to be rehabilitated to improve irrigation output.
- Another 500 hectares at the western, southern and northern parts of the irrigable plot can be developed to enable more farmers to crop relatively larger plots to earn reasonable income, thus making irrigated farming more cost-effective venture;
- Inability of the society to elect its executive members as a result of the District Chief Executive's order or intervention which was to allow the DCE to find a solution but which has not materialised; and
- Respondents suggested that the training programme should cover project administrators to enhance the efficiency and effectiveness of monitoring and evaluation of projects.

1.5.2. Tanoso Cooperative Society

- Currently, 120 farmers are cultivating 30 acres of irrigable plot. Thus, each farmer has access to 0.25 acre to cultivate. The small plot being cultivated inhibits irrigated farming to be cost-effective venture for a peasant farmer.
- The society has only one electric pump donated by the Food and Agriculture Organization of the United Nations in 1984. The pump irrigates 12 hectares for 6 hours per day and this limits the size of irrigable plot that can be cultivated by farmers.
- Owing to only one pump at site, a large number of farmers on yearly basis do not get access to the irrigated plot to crop and this puts a lot of burden and frustrations on the project management team including society's executive members;
- The only pump at the site is old (20 years in usage) and the society needs three additional electric pumps to accommodate many more farmers especially the youth in the community. The youth has expressed interest in irrigated farming because of its enormous economic and social benefits to the community;

- The potential irrigable area is 64 hectares but only 12 hectares are cropped, representing only 18.75% of the total available land. This coupled with the youth's interest should compel GIDA and its collaborators to assist the farmers to improve the farming system;
- Farmers use simple tools and equipment to prepare land for cropping and this makes the farming tedious and unattractive. The society is optimistic to get a tractor and its accessories to prepare land and cart farm produce to marketing centers.
- The society needs to have a new pump house, laterals and pipes (plastics or aluminum) and office for the project team as well as a farmers' conference hall for meetings. Currently the society holds meeting under a mango tree, which is not suitable for effective society's development and management.

1.5.3. Afife Cooperative Society

- The vegetable farmers complained bitterly about the Cooperative Society's refusal to assist them in vegetable crops production and marketing even though the vegetables are perishable and need to be sold quickly;
- The marketing of the vegetable crops depends on middlemen who also provide some form of loan, which is used to support household budget. During the sale of the produce the middlemen dictate the price and eventually members of the society earn absolute nothing from the venture, it thus appears that vegetable farming is not cost-effective venture because of middlemen activities at the project site;
- Measurement and weights of farm produce have not been standardized; making computation of yield of vegetable crops very difficult. For instance, okra is sold in fingers instead in kilograms. This makes assessment of yield for research and economic analysis very difficult to do.

1.5.4. Ashaiman Cooperative Society

- Farmers are scattered around the project site and it is difficult getting all of them to participate in meetings regularly;
- Measurement and weights of farm produce have not been standardized, making computation of yield of vegetable crops very difficult to do. For instance, okra is sold in fingers instead of kilograms and cabbage is sold as heads;
- The respondent farmers and executive members observed that some of the farmers are lazy, indisciplined and their attitude towards the project is not encouraging and they do not attach importance to the training programme being provided under the SSIAPP-FU. They suggested that lazy members should be sanctioned;

- The lazy members of the society should be sanctioned through temporarily suspension and their plots re-allocated to new and serious members for cropping;
- The Society's biggest challenges are how to reduce the cost of production per unit area and also to increase the yield of crops per unit area. This is because the members are adamant in adopting the improved agronomic practices they have been exposed to through the SSIAPP-FU training and workshop programmes;
- The size of irrigable plots for farming is too small and new areas (eastern portion of the project) should be developed to enable farmers have access to larger plots for farming;
- Subsequent training should focus on business management, behavioural and attitudinal aspects in project management, management of sustainable development projects; etc to change farmers' values, perceptions and behaviour in farming operations.

1.5.5. Okyereko Cooperative Society

- Some of the farmers are lazy, undisciplined and their attitude towards the project is not encouraging. They even refuse to be present at the site to irrigate their fields and often blame the executive members for poor harvest of their crops.
- High salinity of some portions of the irrigable plot;
- During the survey, the research team observed the low level of water in the dam compelling the executive members to suspend cropping until the onset of the rains;
- Some of the respondent farmers observed that their plots are far away from the dam (lateral 7) and as such; it is very difficult to get adequate water for irrigation which is adversely affecting their crop yields and income levels;
- About 30 additional hectares of plots can be developed to accommodate more farmers and the youth in the community;
- Society need to get access to harvesting equipment to reduce high losses associated with manual harvesting of rice; and
- The society needs rice-milling machinery with destining facility at the project site to avoid the middlemen taking advantage of buying the paddy rice at low price at the farm gate and milling to sell the rice at relatively higher price to consumers to reap high profit margin at the expense of the poor farmers.

APPENDIX II
**A summary of the responses from all the
Irrigation Projects visited.**

1. ASHAIMAN Irrigation Project

Summary of findings at the ASHAIMAN Irrigation Project

Gender distribution

Of the total Number of seventy-seven farmers sampled in Ashaiman, the distribution according to gender is as below.

Gender	No.	%
Male	64	83
Female	13	17
Total	77	100

Age distribution

Age group	No.	%
Below 30	4	5
30 – 39	14	18
40 – 49	15	20
50 – 59	26	34
60 & above	18	23
Total	77	100

It therefore follows that the farmers at Ashaiman are predominantly male. Seventy-seven percent (77%) of the respondent farmers are less than 60 years of age. The project can therefore be sustained for a long time.

The Impact of the SSIAPP Follow-Up

Below is the table indicating the assessment of the respondent farmers at Ashaiman as to whether they benefited from the SSIASPP Follow-Up or not by area of assessment.

Area of Assessment	% Yes	% No
Crop management	94	6
Management of Cooperatives	91	9
Improvement of Irrigation	94	6
Record keeping	84	16
Farm management	87	13
Total	450	50
Mean	90	10

This implies that on the average, ninety percent (90%) of the farmers sampled at Ashaiman consider the areas covered under the SSIASPP Follow-Up as very beneficial.

Below is the table showing indication of the respondent farmers as to whether their income from irrigated farming improved or not since the SSIAPP Follow-Up.

	No.	%
Yes	59	77
No	18	23
Total	77	100

The SSIAPP-FU has had a tremendous impact on the farmers at Ashaiman. Seventy-seven (77%) of respondent farmers have had improved income from irrigated farming during the SSIAPP-FU.

Below is the table indicating how the respondent farmers at Ashaiman rated the intervention of the SSIAPP Follow-Up

Rating	No.	%
High	26	34
Medium	44	57
Low	5	6
Very Low	2	3
Total	77	100

Only nine percent (9%) of respondent farmers at Ashaiman are of the view that the intervention of the SSIAPP-FU is low.

Below is the table indicating whether the respondent farmers at the Ashaiman irrigation project had had any training under the SSIAPP-FU.

Response	No.	%
Yes	62	81
No	15	19
Total	77	100

Less than twenty percent (20%) of the respondent farmers at Ashaiman did not have any training under the SSIAPP-FU.

Below is the table indicating whether the training given the respondent farmers at the Ashaiman irrigation project had been of any benefit to them.

Response	No.	%
Yes	61	98
No	1	2
Total	62	100

Only one farmer (2% of the respondent farmers) at Ashaiman indicated that the training under the SSIAPP-FU has not benefited him.

Below is the table indicating how the respondent farmers at Ashaiman rated their level of appreciation for the various support services provided under the SSIAPP Follow-Up

SUPPORT SERVICES PROVIDED UNDER SSIAPP-FU				
Support Service	High	Average	Low	Very Low
The Co-operative System	39	55	3	3
Extension Services	43	45	11	1
Irrigation water management	77	20	2	1
Use of Agric. Machinery	51	32	14	3
Total	210	152	30	8
Mean	52.5	38	7.5	2

On the average, about ninety-one percent (**90.5%**) of the respondent farmers rated the support services provided under the SSIAPP-FU as average to high.

As a result of the successful operation of the above services, the farmers Cooperative at Ashaiman has developed capacities in providing the underlisted services to the farmers.

Below shows the respondents' rating of the services provided by the Cooperative Society:

ADDITIONAL SUPPORT SERVICES				
Support Service	High	Average	Low	Very Low
Credit Facilities	39	54	4	3
Farm Inputs	50	48	1	1
Maintenance of Agric Machinery	30	44	21	5
Total	119	146	26	9
Mean	39.67	48.67	8.67	3

Eighty-eight (88%) of the respondent farmers at Ashaiman rated the additional support services provided by the farmers' cooperative society as average to high.

Below is the table indicating the level of satisfaction of the respondent farmers at Ashaiman for the intervention of the SSIAPP Follow-Up on the whole.

Level of Satisfaction	No.	%
Highly	32	42
Averagely	38	49
Lowly	4	5
Not satisfied at all	3	4
Total	77	100

Only nine percent (9%) of the respondent farmers at Ashaiman said their satisfaction level for the intervention of the SSIAPP-FU was low.

Below is the table indicating how the respondent farmers at Ashaiman rated the irrigation management system during the SSIAPP-FU by percentage.

SYSTEM	Very good	Good	Fair	Poor
Water Availability	88	9	3	0
Water supply scheduling	70	24	4	2
Maintenance of facilities	43	41	14	2

Below is the table indicating how the respondent farmers at Ashaiman rated the relationship between project team and farmers by respondents

Rating	No.	%
High	30	39
Average	45	59
Low	1	1
Very low	1	1
Total	77	100

Only two percent (2%) of the respondent farmers at Ashaiman indicated that the relationship between the project team and farmers is low.

Below is the table indicating how the respondent farmers at Ashaiman evaluated their standards **of living now** as compared with their standards of living before the SSIAPP-FU.

Response	No.	%
Can't Tell	1	1
Worse	3	4
The Same	9	12
Just Better	53	69
Much Better	11	14
Total	77	100

Eighty-three percent (83%) of the respondent farmers at Ashaiman believe that their standard of living has improved under the SSIAPP-FU.

Below is the table indicating how the farmers at Ashaiman responded to the question;

"Do you think the Government is doing enough to support your farming business?"

Response	No.	%
Yes	14	18
No	63	82
Total	77	100

Less than twenty percent (20%) of the respondent farmers at Ashaiman think that the government is doing enough to support their farming business. This implies that the appreciation level among farmers for self-help is still quite low.

2. OKYEREKO Irrigation Project

The Summary of findings at the OKYEREKO Irrigation Project.

Sex distribution

Sex	No.	%
Male	34	58
Female	25	42
Total	59	100

Age distribution

Age group	No.	%
Below 30	4	7
30 – 39	11	18
40 – 49	23	39
50 – 59	13	22
60 & above	8	14
Total	59	100

Fifty-eight percent (58%) of the respondent farmers at Okyereko are males and only fourteen percent (14%) of the respondent farmers are 60 years and above. The Project may therefore be sustained for a long time.

Below is the table indicating the assessment of the respondent farmers as to whether they benefited from the SSIAPP Follow-Up or not concerning the indicated areas.

Area of Assessment	% Yes	% No
Crop management	98	2
Management of Cooperatives	97	3
Improvement of Irrigation	98	2
Record keeping	93	7
Farm management	95	5

Nearly all the respondent farmers (over 90%) at Okyereko have appreciated the area of support services provided under the SSIAPP Follow-Up.

Below is the table showing indication of the respondent farmers as to whether their income from irrigated farming improved or not since the SSIAPP Follow-Up.

Response	No.	%
Yes	33	56
No	26	44
Total	59	100

This table shows that fifty-six percent (56%) of the respondent farmers at Okyereko indicated that their income had improved due to irrigated farming. This is as a result

of various reasons, including, the use of better agronomic practices and a more efficient use of inputs.

Below is the table indicating how the respondent farmers at Okyereko appreciated the guidance provided under the SSIAPP Follow-Up.

Rating	No.	%
High	34	58
Medium	23	39
Low	2	3
Very Low	0	0
Total	59	100

Only three percent (3%) of the respondent farmers at Okyereko indicated that the guidance provided under the SSIAPP Follow-Up was low.

Below is the table indicating whether the respondent farmers at the Okyereko irrigation project had had any training under the SSIAPP-FU.

Response	No.	%
Yes	53	90
No	6	10
Total	59	100

Ninety percent (90%) of the respondent farmers at Okyereko were trained under the SSIAPP-FU.

Below is the table indicating whether the training given the respondent farmers at the Okyereko irrigation project had been of any benefit to them.

Response	No.	%
Yes	45	85
No	8	15
Total	53	100

Only fifteen percent (15%) of the respondent farmers at Okyereko who had had training indicated that the training under the SSIAPP-FU was not beneficial.

Below is the table indicating how the respondent farmers at Okyereko rated the various support services provided under the SSIAPP Follow-Up.

SUPPORT SERVICES PROVIDED UNDER SSIAPP-FU				
Support Service	High	Average	Low	Very Low
The Co-operative System	81	19	0	0
Extension Services	80	20	0	0
Irrigation water management	88	12	0	0
Use of Agric. Machinery	84	12	2	2
Total	333	63	2	2
Mean	83.25	15.75	0.5	0.5

On the average, ninety-nine percent (**99%**) of the respondents rated the support services provided under the SSIAPP-FU as high and average.

As a result of the successful operation of the above services, the farmers Cooperative at Okyereko has developed capacities in providing the underlisted services to the farmers.

Below shows the respondents' rating of the services provided by the Cooperative Society:

ADDITIONAL SUPPORT SERVICES				
Support Service	High	Average	Low	Very Low
Credit Facilities	80	20	0	0
Farm Inputs	98	2	0	0
Maintenance of Agric Machinery	76	20	2	2
Total	254	42	2	2
Mean	84.67	14	0.67	0.67

Over ninety-eight percent (**98%**) of the respondent farmers at Okyereko rated the additional support services provided by the farmers' cooperative society as average to high.

Below is the table indicating the level of appreciation of the respondent farmers at Okyereko for the guidance during the SSIAPP Follow-Up.

Response	No.	%
Highly	41	70
Averagely	17	28
Lowly	1	2
Not satisfied at all	0	0
Total	59	100

Only two percent (2%) of the respondent farmers at Okyereko indicated that their appreciation level for the support services during the SSIAPP-FU were low.

Below is the table indicating how the respondent farmers at Okyereko rated the irrigation management system during the SSIAPP-FU.

SYSTEM	Very Good	Good	Fair	Poor
	%	%	%	%
Water Availability	66	34	0	0
Water supply scheduling	81	19	0	0
Maintenance of facilities	79	21	0	0

All the respondent farmers at Okyereko indicated that the irrigation management system during the SSIAPP-FU was good.

Below is the table indicating how the respondent farmers at Okyereko rated the relationship between project team and farmers by respondents

Rating	No.	%
High	46	78
Average	13	22
Low	0	0
Very low	0	0
Total	59	100

All the respondent farmers at Okyereko indicated that the relationship between the Project Team and farmers was average to high.

Below is the table indicating how the respondent farmers at Okyereko evaluated their standards **of living** of respondents **now** as compared with their standards of living before the SSIAPP-FU.

	No.	%
Can't Tell	0	0
Worse	1	2
The Same	11	19
Just Better	38	64
Much Better	9	15
Total	59	100

Seventy-nine percent (79%) of the respondent farmers at Okyereko indicated that their standard of living had improved under the SSIAPP-FU.

Below is the table indicating how the farmers at Okyereko responded to the question;

"Do you think the Government is doing enough to support your farming business?"

Response	No.	%
Yes	22	37
No	37	63
Total	59	100

Less than forty percent (40%) of the respondent farmers at Okyereko think that the government is doing enough to support their farming business.

3. AFIFE Irrigation Project

The Summary of findings at the AFIFE Irrigation Project

Sex distribution

Of the total Number of sixty farmers sampled in Afife, the distribution according to sex is as below.

Sex	No.	%
Male	57	95
Female	3	5
Total	60	100

Age distribution

Age group	No.	%
Below 30	8	13
30 – 39	21	35
40 – 49	19	32
50 – 59	10	17
60 & above	2	3
Total	60	100

It therefore follows that the respondent farmers at Afife are predominantly male. Ninety-seven percent (97%) of the respondent farmers are less than 60 years of age. The project can therefore be sustained for a long time.

Impact of the SSIAPP Follow-Up

Below is the table indicating the assessment of the respondent farmers as to whether they benefited from the SSIAPP Follow-Up or not concerning the indicated areas.

Area of Assessment	% Yes	% No
Crop management	98	2
Management of Cooperatives	87	13
Improvement of Irrigation	97	3
Record keeping	85	15
Farm management	95	5

Below is the table showing indication of the respondent farmers at Afife as to whether their income from irrigated farming improved or not since the SSIAPP Follow-Up.

Response	No.	%
Yes	52	87
No	8	13
Total	60	100

The SSIAPP-FU has had a tremendous impact on the farmers at Afife. Eighty-seven percent (87%) of respondent farmers have had improved income from irrigated farming as a result of the SSIAPP-FU. This was because the guidance received during the SSIAPP-FU enabled the farmers to increase their production levels.

Below is the table indicating how the respondent farmers at Afife rated the intervention of the SSIAPP Follow-Up.

Rating	No.	%
High	17	27
Medium	38	64
Low	5	9
Very Low	0	0
Total	60	100

Only nine percent (9%) of respondent farmers at Afife are of the view that the intervention of the SSIAPP-FU is low.

Below is the table indicating whether the respondent farmers at the Afife irrigation project had had any training under the SSIAPP-FU.

Response	No.	%
Yes	57	95
No	3	5
Total	60	100

Just five percent (5%) of the respondent farmers at Afife did not have any training under the SSIAPP-FU. This means that most of the respondent farmers at Afife were trained during the SSIAPP-FU.

Below is the table indicating whether the training given the respondent farmers at the Afife irrigation project had been of any benefit to them.

Response	No.	%
Yes	55	96
No	2	4
Total	57	100

Only four percent (4%) of the respondent farmers who had had training at Afife indicated that the training under the SSIAPP-FU has not benefited them.

Below is the table indicating how the respondent farmers at Afife rated the enhancement level of the various support services as a result of the SSIAPP-FU.

Support Service	High	Average	Low	Very Low
The Co-operative System	32	57	8	3
Extension Services	28	60	12	0
Farm Inputs	37	55	8	0
Irrigation water management	28	57	10	5
Use of Agric. Machinery	24	37	27	12
Maintenance of Agric Machinery	19	42	24	15
Total	168	308	89	35
Average	28	51	15	6

On the average, seventy-nine percent (79%) of the respondent farmers at Afife think that the support services were enhanced during the SSIAPP-FU.

Below is the table indicating the level of satisfaction of the respondent farmers at Afife rated the intervention of the SSIAPP Follow-Up on the whole.

Level of Satisfaction	No.	%
Highly	27	45
Averagely	31	52
Lowly	2	3
Not satisfied at all	0	0
Total	60	100

Most of the respondent farmers ninety-seven percent (97%) at Afife are highly satisfied with the support services under the project.

Below is the table indicating how the respondent farmers at Afife rated the irrigation management system during the SSIAPP-FU.

SYSTEM	Very good	Good	Fair	Poor
Water Availability	47	50	3	0
Water supply scheduling	35	45	18	2
Maintenance of facilities	27	42	26	5
Total	109	137	47	7
Mean	36	46	16	2

Eighty-two percent (82%) of the respondent farmers at Afife are satisfied with the irrigation management system.

Below is the table indicating how the respondent farmers at Afife rated the relationship between project team and farmers by respondents.

Rating	No.	%
High	21	35
Average	32	54
Low	6	9
Very low	1	2
Total	60	100

Only eleven (11%) of the respondent farmers at Afife indicated that the relationship between the project team and farmers is low.

Below is the table indicating how the respondent farmers at Afife evaluated their **standards of living** of respondents **now** as compared with their standards of living before the SSIAPP-FU.

Response	No.	%
Can't Tell	4	7
Worse	0	0
The Same	0	0
Just Better	33	55
Much Better	23	38
Total	60	100

Ninety-three percent (93%) of the respondent farmers at Afife believe that their standard of living has improved under the SSIAPP-FU because of the ability to afford medical services, availability of food in the homes and payment of school fees of their wards.

Below is the table indicating how the respondent farmers at Afife responded the question;

"Do you think the Government is doing enough to support your farming business?"

Response	No.	%
Yes	40	67
No	20	33
Total	57	100

About seventy percent (70%) of the respondent farmers at Afife think that the government is doing enough to support their farming business.

Some recommendations;

- There is the need to revive the credit line with the District Assemblies, which was suspended when some farmers defaulted.

4. TANOSO Irrigation Project

The Summary of findings at the TANOSO Irrigation Project

Sex distribution

Of the total Number of forty-three farmers sampled in Tanoso, the distribution according to sex is as below.

Sex	No.	%
Male	21	49
Female	22	51
Total	43	100

Age distribution

Age group	No.	%
Below 30	2	5
30 – 39	24	56
40 – 49	14	33
50 – 59	3	7
60 & above	0	0
Total	43	100

Forty-nine percent (49%) of the respondent farmers at Tanoso are males and none of the respondent farmers is over 60 years and above. The chances for the sustainability of the project are very high.

Impact of the SSIAPP Follow-Up

Below is the table indicating the assessment of the respondent farmers at Tanoso as to whether they benefited from the **SSIAPP Follow-Up** or not concerning the indicated areas.

Area of Assessment	% Yes	% No
Crop management	100	0
Management of Cooperatives	100	0
Improvement of Irrigation	100	0
Record keeping	85	15
Farm management	100	0

All the respondent farmers at Tanoso believe that they have benefited from most aspects of the SSIAPP-FU. However, a few of the respondent farmers have problems with record keeping.

Below is the table showing indication of the respondent farmers at Tanoso as to whether their income from irrigated farming improved or not since the SSIAPP Follow-Up.

Response	No.	%
Yes	43	100
No	0	0
Total	43	100

This table shows that all of the respondent farmers at Tanoso believe that their income had improved due to irrigated farming as a result of the training and guidance provided under the SSIAPP-FU.

Below is the table indicating how the respondent farmers at Tanoso appreciated the workshops and training under the intervention of the SSIAPP Follow-Up.

Rating	No.	%
High	43	100
Medium	0	0
Low	0	0
Very Low	0	0
Total	43	100

All the respondent farmers at Tanoso highly appreciate the workshops and training during the SSIAPP-FU intervention.

Below is the table indicating whether the respondent farmers at the Tanoso irrigation project had had any training under the SSIAPP-FU.

Response	No.	%
Yes	40	93
No	3	7
Total	43	100

Ninety-three percent (93%) of the respondent farmers at Tanoso were trained under the SSIAPP-FU.

Below is the table indicating whether the training given the respondent farmers at the Tanoso irrigation project had been of any benefit to them.

Response	No.	%
Yes	40	100
No	0	0
Total	40	100

All respondent farmers at Tanoso indicated that the training under the SSIAPP-FU was very beneficial to them.

Below is the table indicating how the respondent farmers at Tanoso rated the various support services they enhanced through the influence of SSIAPP-FU.

Support Service	High	Average	Low	Very Low
The Co-operative System	98	2	0	0
Extension Services	61	37	2	0
Credit Facilities	31	65	4	0
Farm Inputs	84	14	2	0
Irrigation water management	92	8	0	0
Use of Agric. Machinery	69	28	3	0
Maintenance of Agric Machinery	68	29	3	0
Total	503	183	14	0
Mean	72	26	2	0

Only two percent (2%) of the respondent farmers at Tanoso thought that the support services they enhanced through the influence of the SSIAPP-FU were on the average low.

Below is the table indicating the level of satisfaction of the respondent farmers at Tanoso for the intervention of the SSIAPP Follow-Up on the whole.

Level of Satisfaction	No.	%
Highly	43	100
Averagely	0	0
Lowly	0	0
Not satisfied at all	0	0
Total	43	100

All the respondent farmers at Tanoso indicated that they were highly satisfied with the support services they initiated during the SSIAPP-FU.

Below is the table indicating how the respondent farmers at Tanoso rated the irrigation management system during the SSIAPP-FU.

SYSTEM	Very good	Good	Fair	Poor
Water Availability	100	0	0	0
Water supply scheduling	95	5	0	0
Maintenance of facilities	60	40	0	0

All the respondent farmers at Tanoso indicated that the irrigation management system during the SSIAPP-FU was good.

Below is the table indicating how the respondent farmers at Tanoso rated the relationship between project team and farmers.

Rating	No.	%
High	43	100
Average	0	0
Low	0	0
Very low	0	0
Total	43	100

All the respondent farmers at Tanoso expressed that the relationship between the Project Team and farmers is high.

Below is the table indicating how the respondent farmers at Tanoso evaluated their **standards of living now** as compared with their standards of living before the SSIAPP-FU.

Response	No.	%
Can't Tell	0	0
Worse	0	0
The Same	0	0
Just Better	2	5
Much Better	41	95
Total	43	100

All the respondent farmers at Tanoso indicated that their standards of living have improved under the SSIAPP-FU because they now have food in the house, are able to pay the school fees of their children and pay for medical bills for their families.

Below is the table indicating how the respondent farmers at Tanoso responded to the question;

"Do you think the Government is doing enough to support your farming business?"

Response	No.	%
Yes	27	63
No	16	37
Total	43	100

Sixty-three percent (63%) of the respondent farmers at Tanoso think that the government is doing enough to support their farming business.

A recommendation;

- For an irrigation project running on only one pump, the application of water needs to be well controlled to minimize its wastage and limit the use of electricity. Consequently, it is recommended that tensiometers be provided to help in monitoring moisture levels in the root zone so as to ensure optimum use of irrigation water.

5. BONTANGA Irrigation Project

The Summary of findings at the BONTANGA Irrigation Project

Sex distribution

Of the total Number of thirty-eight farmers sampled in Bontanga, the distribution according to sex is as follows.

Sex	No.	%
Male	32	84
Female	6	16
Total	38	100

Age distribution

Age group	No.	%
Below 30	3	8
30 – 39	15	40
40 – 49	10	26
50 – 59	7	18
60 & above	3	8
Total	38	100

From the tables above, it follows that the respondent farmers at Bontanga are predominantly male. Ninety-two percent (92%) of the respondent farmers are less than 60 years of age.

Impact of the SSIAPP Follow-Up programme

Below is the table indicating the assessment of the respondent farmers as to whether they benefited from the SSIASPP Follow-Up or not concerning the indicated areas.

Area of Assessment	% Yes	% No
Crop management	97	3
Management of Cooperatives	97	3
Improvement of Irrigation	97	3
Record keeping	97	3
Farm management	97	3

All the respondent farmers at Bontanga are ninety-seven percent (97%) satisfied with the Management services under the SSIAPP-FU.

Below is the table showing indication of the respondent farmers at Bontanga as to whether their income from irrigated farming had improved or not since the SSIAPP Follow-Up.

Response	No.	%
Yes	33	86
No	5	14
Total	38	100

The SSIAPP-FU has had a tremendous impact on the farmers at Bontanga. Eighty-six percent (86%) of respondent farmers have had improved income from irrigated farming during the SSIAPP-FU due mainly to availability of food in their homes, their ability to care for their children in school and the fact that some of them have been able to make some investments.

Below is the table indicating how the respondent farmers at Bontanga rated the intervention of the SSIAPP Follow-Up.

Rating	No.	%
High	30	79
Medium	8	21
Low	0	0
Very Low	0	0
Total	38	100

All respondent farmers at Bontanga rate the intervention of the SSIAPP-FU as high.

Below is the table indicating whether the respondent farmers at the Bontanga irrigation project had had any training under the SSIAPP-FU.

Response	No.	%
Yes	35	93
No	3	7
Total	38	100

Just seven percent (7%) of the respondent farmers at Bontanga did not have any training under the SSIAPP-FU.

Below is the table indicating whether the training given the respondent farmers at the Bontanga irrigation project had been of any benefit to them.

Response	No.	%
Yes	35	100
No	0	0
Total	35	100

All the respondent farmers at Bontanga indicated that the training under the SSIAPP-FU has benefited them.

Below is the table indicating how the respondent farmers at Bontanga rated the various support services enhanced as a result of the SSIAPP Follow-Up.

Support Service	High	Average	Low	Very Low
The Co-operative System	83	17	0	0
Extension Services	63	21	13	3
Farm Inputs	13	40	20	27
Irrigation water management	28	48	15	9
Use of Agric. Machinery	4	37	33	26
Maintenance of Agric Machinery	11	21	36	32
Total	202	184	116	97
Average	34	31	19	16

Thirty-five percent (35%) of the respondent farmers at Bontanga believe that the various support services they enhanced during the SSIAPP-FU are not effective.

Below is the table indicating the level of satisfaction of the respondent farmers at Bontanga for the intervention of the SSIAPP-FU on the whole.

Level of Satisfaction	No.	%
Highly	20	53
Averagely	18	47
Lowly	0	0
Not satisfied at all	0	0
Total	38	100

All the respondent farmers at Bontanga rated their satisfaction of the support services under the project as average to high.

Below is the table indicating how the respondent farmers at Bontanga rated the irrigation management system during the SSIAPP-FU.

SYSTEM	Very good	Good	Fair	Poor
Water Availability	83	17	0	0
Water supply scheduling	53	44	3	0
Maintenance of facilities	40	33	24	3
Total	176	94	27	3
Mean	59	31	9	1

Only ten percent (10%) of the respondent farmers at Bontanga believe that the Irrigation Management System during the SSIAPP-FU was not effective.

Below is the table indicating how the respondent farmers at Bontanga rated the relationship between the project team and farmers by respondents

Rating	No.	%
High	22	58
Average	16	42
Low	0	0
Very low	0	0
Total	38	100

None of the respondent farmers at Bontanga expressed any poor relationship between the project team and the farmers.

Below is the table indicating how the respondent farmers at Bontanga evaluated their **standards of living now** as compared with their standards of living before the SSIAPP-FU.

Response	No.	%
Can't Tell	0	0
Worse	0	0
The Same	0	0
Just Better	13	33
Much Better	25	67
Total	38	100

All respondents have experienced an improvement in their standard of living as a result of the SSIAPP-FU. This is because, apart from the availability of food in the homes and payment of school fees for their wards, they have been able to acquire some physical assets such as radios and television sets.

Below is the table indicating how the farmers at Bontanga responded to the question;

"Do you think the Government is doing enough to support your farming business?"

Response	No.	%
Yes	27	70
No	11	30
Total	38	100

Seventy percent (70%) of the respondent farmers at Bontanga think that the government is doing enough to support their farming business.

They however made the following recommendations;

- The irrigation facilities such as canals and gates at Bontanga need to be repaired to enhance efficient water distribution.
- Excess water outflow from present scheme could be channeled and used to develop another irrigation project downstream.

6. All the 5 Irrigation projects combined.

Summary of the findings of all the FARMERS from all the projects combined.

Sex distribution

Of the total Number of two hundred and seventy-seven farmers sampled from all the five selected irrigation projects, the distribution according to sex is as below.

Sex	No.	%
Male	208	75
Female	69	25
Total	277	100

Age distribution

Age group	No.	%
Below 30	21	8
30 – 39	85	31
40 – 49	81	29
50 – 59	59	21
60 & above	31	11
Total	277	100

Seventy-five percent (75%) of all the respondent farmers are males and only eleven percent (11%) of them are 60 years and above. This implies that the chances of sustainability of the projects generally are very high.

The Impact of the SSIAPP Follow-Up

Below is the table indicating the assessment of the farmers as to whether they benefited from the SSIASPP Follow-Up or not concerning the indicated areas.

Area of Assessment	% of YES response at the 5 schemes					Sum	Mean %	
	Ashaiman	Okyereko	Afife	Tanoso	Bontanga		YES	NO
Crop Management	94	98	98	100	97	487	97	3
Management of Cooperatives	91	97	87	100	97	472	94	6
Improvement of Irrigation	94	98	87	100	97	486	97	3
Record keeping	84	93	85	85	97	444	89	11
Farm Management	87	95	95	100	97	474	95	5
Total							472	31
Mean %							94	6

Ninety-four percent (94%) of the respondent farmers from all the five projects believe that they have benefited from all the training and workshops during the SSIAPP-FU.

Below is the table showing indication of the farmers as to whether their income from irrigated farming improved or not since the SSIAPP Follow-Up.

Response	%
Yes	79
No	21
Total	100

This table shows that seventy-nine percent (79%) of the farmers from the five schemes indicated that their income from irrigated farming had improved due to the intervention of SSIAPP-FU.

Below is the table indicating how the farmers rated the intervention of the SSIAPP Follow-Up.

Ratings	%
High	53
Medium	42
Low	5
Very Low	1
Total	100

Only six percent (6%) of the respondent farmers rated the SSIAPP-FU intervention as low.

Below is the table indicating whether all the respondent farmers had had any training under the SSIAPP-FU.

Response	%
Yes	90
No	10
Total	100

Ninety percent (90%) of all respondent the farmers indicated that they had been trained under the SSIAPP-FU.

Below is the table indicating whether the training given the respondent farmers had been of any benefit to them.

Response	%
Yes	95
No	5
Total	100

Ninety-five percent (95%) of the respondent farmers who had training during the SSIAPP-FU indicated that the training during the SSIAPP-FU was very beneficial to them.

Below is the table indicating how all the respondent farmers rated the various support services enhanced as a result of the SSIAPP Follow-Up

Support Service	High	Average	Low	Very Low
The Co-operative System	67	30	2	1
Extension Services	55	37	8	1
Credit Facilities	42	46	3	9
Farm Inputs	56	32	6	6
Irrigation water management	63	29	5	3
Use of Agric. Machinery	46	29	16	9
Maintenance of Agric Machinery	41	31	17	11
Total	370	234	57	40
Mean	53	33	8	6

About fourteen percent (14%) of all the respondent farmers under the five schemes rated the support services during the SSIAPP-FU as low. It is however pertinent to note that services such as credit facilities and Farm Inputs were only available at Ashaiman and Okyereko during the SSIAPP-FU. The other three projects improved their credit facilities and farm inputs mainly as a result of the workshops and training during the SSIAPP-FU.

Below is the table indicating the level of satisfaction of the farmers rated the intervention of the SSIAPP Follow-Up on the whole.

Response	%
Highly	59
Averagely	37
Lowly	3
Not satisfied at all	1
Total	100

Ninety-six percent (96%) of all the respondent the farmers indicated that they were very satisfied with the support services during the SSIAPP-FU.

Below is the table indicating how the farmers rated the irrigation management system during the SSIAPP-FU.

SYSTEM	Very good	Good	Fair	Poor
Water Availability	77	22	1	0
Water supply scheduling	67	27	5	1
Maintenance of facilities	50	35	13	2

Most of all the respondent farmers of the schemes indicated that the irrigation management system during the SSIAPP-FU was good.

Below is the table indicating how the farmers rated the relationship between project team and farmers by respondents

Rating	%
High	59
Average	38
Low	2
Very low	1
Total	100

Ninety-seven percent (97%) of the combined farmers expressed that the relationship between the Project Team and farmers is from average to high.

Below is the table indicating how the farmers evaluated their standards **of living** of respondents **now** as compared with their standards of living before the SSIAPP-FU.

Response	%
Can't Tell	2
Worse	1
The Same	7
Just Better	50
Much Better	40
Total	100

Ninety percent (90%) of all the farmers combined indicated that their standard of living had improved during the SSIAPP-FU.

Below is the table indicating how the farmers responded the question;
"Do you think the Government is doing enough to support your farming business?"

Response	%
Yes	49
No	51
Total	100

Only forty-nine percent (49%) of the farmers under the five selected schemes think that the government is doing enough to support their farming business. This implies that generally, the farmers on the irrigation projects under GIDA expect the Government to do more to support irrigation farming in Ghana.