

# ***ANNEX***

*G-1 Project Investigation Sheet*

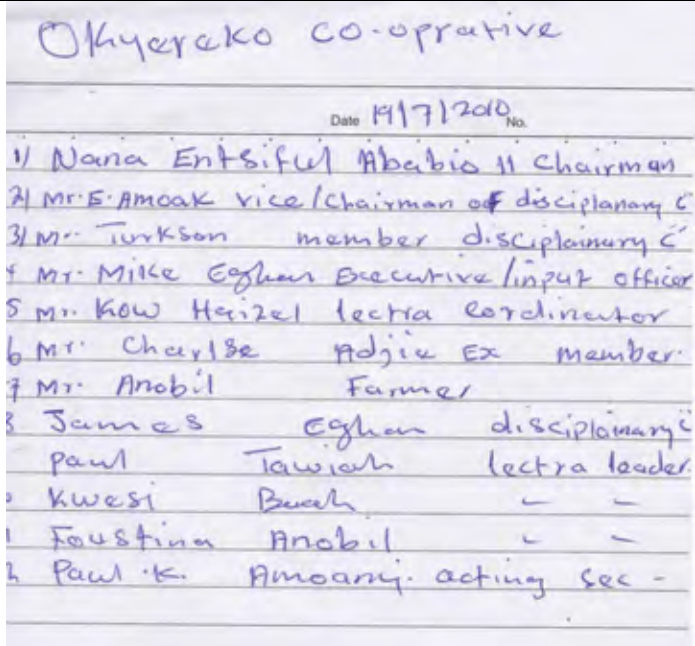
*G-2 List of Irrigation and Drainage Project*

*G-3 List of Collected Data and Documents*

## G-1 Project Investigation Sheet

### Project Investigation Sheet (1)

Project Title	<b>OKYEREKO Irrigation Scheme</b>																
Project Location	Central Region, Gomoa Region, Okyereko village: 50 km from Accra (No.1 on the Location Map)																
Date of Investigation	July 19 <sup>th</sup> , 2010																
Request by Agency	<p>Improveent of left bank Area</p> <ul style="list-style-type: none"> <li>- Land leveling : 18 ha</li> </ul> <p>Restoration of damaged parts by flood occurred at the beginning of July, 2010</p> <ul style="list-style-type: none"> <li>- Restoration of Dyke along the Ayunsu river</li> </ul> <p>Provision of O/M and Post harvest machineries</p> <ul style="list-style-type: none"> <li>- Tractor for O/M activities</li> <li>- Combine harvester, Drier for paddy</li> </ul>																
Estimated Project Cost (Estimate by study team)	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Cost Component</th> <th style="text-align: right;">Cost (US\$)</th> </tr> </thead> <tbody> <tr> <td>Land leveling 18 ha</td> <td style="text-align: right;">40,000</td> </tr> <tr> <td>Restoration Works</td> <td style="text-align: right;">424,000</td> </tr> <tr> <td><u>Staff Training</u></td> <td style="text-align: right;"><u>10,000</u></td> </tr> <tr> <td><u>Total of Direct Cost</u></td> <td style="text-align: right;"><u>474,000</u></td> </tr> <tr> <td>Indirect Cost</td> <td style="text-align: right;">280,000</td> </tr> <tr> <td><u>Physical Contingency</u></td> <td style="text-align: right;"><u>47,000</u></td> </tr> <tr> <td>Construction Cost</td> <td style="text-align: right;">801,000</td> </tr> </tbody> </table>	Cost Component	Cost (US\$)	Land leveling 18 ha	40,000	Restoration Works	424,000	<u>Staff Training</u>	<u>10,000</u>	<u>Total of Direct Cost</u>	<u>474,000</u>	Indirect Cost	280,000	<u>Physical Contingency</u>	<u>47,000</u>	Construction Cost	801,000
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Project Area	<table style="width: 100%; border-collapse: collapse;"> <tr> <td>Potential Area</td> <td style="text-align: right;">111 ha</td> <td>Developed Area</td> <td style="text-align: right;">81 ha</td> </tr> <tr> <td>Existing Irrigation Area</td> <td style="text-align: right;">51 ha</td> <td>Requested Area</td> <td style="text-align: right;">18 ha</td> </tr> </table>	Potential Area	111 ha	Developed Area	81 ha	Existing Irrigation Area	51 ha	Requested Area	18 ha								
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Existing Irrigation Area	51 ha	Requested Area	18 ha														
Number of Beneficiaries	Okyereko Water Users Group (established in 1988) 131 farmers (male 88, female 43)																
Investigation Results	<p>This irrigation scheme was constructed in 1976. In 1997, JICA conducted F/S and rehabilitated by grant aid program in 2000.</p> <p>At the time of rehabilitation, one pump station was additionally constructed to cover the extension areas of left bank of 24 ha and right bank of 18 ha. A pipeline connects the pump station and the reservoir.</p> <p>The irrigation system of this scheme is the fully controlled gravity by a reservoir with an effective storage of 2.71 MCM. In case of water shortage, a pump station installed on left bank of the Ayensu river supplies supplemental water to the reservoir.</p> <p>Two main canals with a length of 48 km irrigate right bank area of 63 ha and left bank of 18 ha.</p> <p>Left bank area is unused because of salinity problem and configuration in a part of farm plots.</p> <p>Major crop is Paddy. In order to keep quality of paddy, post harvesting machineries are required.</p> <p>The project area is located at distance of 500m from the Accra - Cape Coast truck road.</p> <p>The farmers' organization signed the contract between GIDA about the O&amp;M in relation to "The project for promotion of Farmers' Participation in Irrigation Management, FAPIM" (JICA)</p>																
Findings	<ul style="list-style-type: none"> <li>• Unuse Problem of Right Bank</li> </ul>																

	<p>As a result of site investigation, there may be no problem with main and secondary canals. The reason may be difficulty of water supply due to configuration of farmlands. Land leveling works would be necessary after surveying the relationship between water level in canals and the farmland levels.</p> <ul style="list-style-type: none"> <li>• Flood Damage and Pump Station</li> </ul> <p>Restoration works should be executed urgently to prevent right bank farmlands from further damages in rainy season in October.</p> <p>The pump house showed traces of the flood to the middle height of windows. This high water might damage control units and motors.</p> <p>Test operation of the pump station would be difficult, because the pump station wasn't used in the past few years and power transmission line was stolen.</p> <p>It is said that the pump station has suffered flood frequently. The location of pump station and ground level of it should be reviewed.</p>
<p>Data/information Collected</p>	<p>-</p>
<p>List of Attendances</p>	 <p>Okyerako CO-operative</p> <p>Date 11/7/2010 No.</p> <ol style="list-style-type: none"> <li>1/ Nana Entsiful Ababio II Chairman</li> <li>2/ Mr. E. Amoak Vice/Chairman of disciplinary C</li> <li>3/ Mr. Turkson member disciplinary C</li> <li>4/ Mr. Mike Eghan Executive/Input officer</li> <li>5/ Mr. Kow Hazel Lectra coordinator</li> <li>6/ Mr. Charlse Adjie Ex member</li> <li>7/ Mr. Anobil Farmer</li> <li>8/ James Eghan disciplinary</li> <li>9/ Paul Tawiah Lectra leader</li> <li>10/ Kwesi Buah - -</li> <li>11/ Faustina Anobil - -</li> <li>12/ Paul K. Amoany acting sec -</li> </ol>

### 1. Okyereko Irrigation Scheme (1/2)



Okyereko Reservoir (Water Source for Irrigation, Effective Storage 2.7 million m<sup>3</sup>)



Left bank Main Canal and Irrigation Area



Left bank Main Canal unused



End point of left bank  
Secondary canal and developed  
field being out of use



Damaged part by Flood at the  
intake site  
Protection Dyke and Spill way  
were washed out

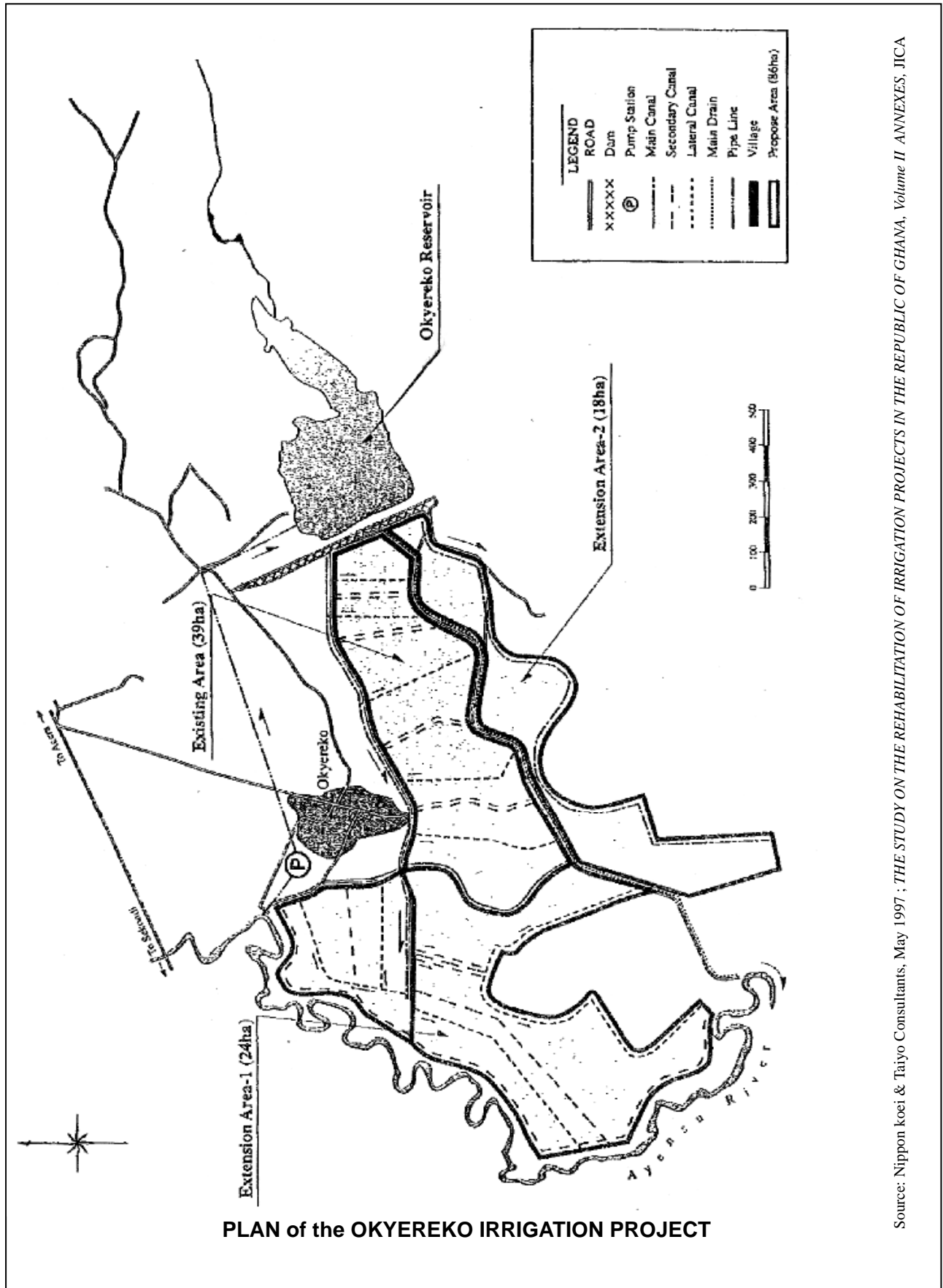
### 1. Okyereko Irrigation Scheme (2/2)



Broken dyke near the pump station



The pump house shows traces of the flood to the middle height of windows.  
Test operation was not conducted after the flood.  
By the way, power transmission lines were stolen. Test operation is difficult to conduct.  
(As shown in the Photo, wooden pole beside the house has no power line.)



Source: Nippon koei & Taiyo Consultants, May 1997; THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA, Volume II ANNEXES, JICA

## Project Investigation Sheet (2)

Project Title	<b>EKOTSI Scheme (Site of AfDB SSID)</b>										
Project Location	Central Region, Mfantseman West, Ekotsi village (No.2 on the Location Map)										
Date of Investigation	July 19 <sup>th</sup> , 2010										
Request by Agency	<ul style="list-style-type: none"> <li>- Construction of Trunk Road, Farm Road</li> <li>- Land reclamation (21ha)</li> <li>- Rehabilitation of Pump Stand</li> <li>- Introduction of Credit System (Request by Farmers)</li> <li>- Supply of Farm Inputs (Request by Farmers)</li> </ul>										
Estimated Project Cost (Estimate by study team based on the GIDA estimate)	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Cost Component</th> <th style="text-align: right;">Cost (US\$)</th> </tr> </thead> <tbody> <tr> <td>Direct Cost (GIDA estimate )</td> <td style="text-align: right;">: 268,000</td> </tr> <tr> <td>Indirect Cost</td> <td style="text-align: right;">: 165,000</td> </tr> <tr> <td><u>Physical Contingency</u></td> <td style="text-align: right;"><u>: 27,000</u></td> </tr> <tr> <td>Construction Cost</td> <td style="text-align: right;">: 460,000</td> </tr> </tbody> </table>	Cost Component	Cost (US\$)	Direct Cost (GIDA estimate )	: 268,000	Indirect Cost	: 165,000	<u>Physical Contingency</u>	<u>: 27,000</u>	Construction Cost	: 460,000
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Project Area	<table style="width: 100%; border-collapse: collapse;"> <tr> <td>Potential Area</td> <td style="text-align: right;">25 ha</td> <td>Developed Area</td> <td style="text-align: right;">4 ha</td> </tr> <tr> <td>Existing Irrigation Area</td> <td style="text-align: right;">0 ha</td> <td>Request Area</td> <td style="text-align: right;">21 ha</td> </tr> </table>	Potential Area	25 ha	Developed Area	4 ha	Existing Irrigation Area	0 ha	Request Area	21 ha		
Potential Area	25 ha	Developed Area	4 ha								
Existing Irrigation Area	0 ha	Request Area	21 ha								
Number of Beneficiaries	55 farmers										
Investigation Results	<p>This scheme has not used since 2006 after construction due to no-execution of land consolidation.</p> <p><b>Irrigation System</b> Irrigation water is scheduled to be pumped up from the Nchi Ochi Nakwa River by movable small pumps, and to distribute through pipeline system. The pipeline system consists of main pipeline (500m), division works (10 nos.) and secondary canals (600m in total). In the original plan, secondary system was designed as pipeline with sprinklers. Unfortunately, at discharging test time, some pipes were broken down. For this reason, the canals adopt open channels. The pump stand would need to be reconstructed because the stand was damaged by sand pits located near the stand.</p> <p><b>Agriculture</b> Target crops are Pepper, Watermelon, Okra, Eggplant, and Maize.</p> <p><b>Accessibility</b> The access road, which connects farm plots to the Accra-Cape Coast trunk road, passes through wetland section. At the time of investigation, the access road has been inundated up to the height of a waist because of the flood occurred in July, 2010. Improvement of access road is crucial.</p>										
Findings	<p>Site condition was not surveyed because of inundation of the access road. Judging from the interview with farmers, the following problems would be reasons for unuse of the irrigation system.</p> <ul style="list-style-type: none"> <li>▪ Lack of access and farm roads in project plan</li> <li>▪ Lack of experience of contractor in construction works</li> <li>▪ Lack of farmers contribution in land consolidation</li> </ul>										
Data Collected	-										
Persons Contacted	3 members of farmers' organization										

## 2. Ekotsi Scheme (Site of AfDB-SSDIP)



Interview with farmers' representatives:  
Pump units and a small tractor for pump have been left in  
a open space. (See the upper left)




Two pump unit. A label on the engine showed the  
manufactured year of 1960s. These pumps have not been  
used since completion of construction works.



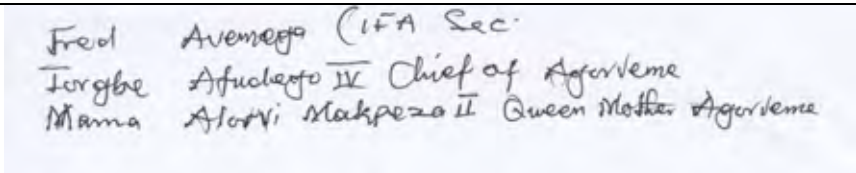
Access road to farmlands near the  
trunk road.  
The road was covered with  
standing water.  
Water depth was approximately  
1.0 m at the deepest point.

### Project Investigation Sheet (3)

Project Title	<b>DORDOEKOPE 2 Scheme (Site of AfDB SSID)</b>																					
Project Location	Greater Accra Region : (No.3 on the Location Map)																					
Date of Investigation	July 20 <sup>th</sup> ,2010																					
Request by Agency	- Land reclamation (80 ha) - Completion of Secondary Canals, Construction of Tertiary Canals																					
Estimated Project Cost (Estimate by study team based on the GIDA estimate)	<table border="0"> <tr> <td>Cost Component</td> <td>Cost (US\$)</td> </tr> <tr> <td>Direct Cost (GIDA estimate) :</td> <td>834,000</td> </tr> <tr> <td>Indirect Cost :</td> <td>471,000</td> </tr> <tr> <td>Physical Contingency :</td> <td>83,000</td> </tr> <tr> <td>Construction Cost</td> <td>1,388,000</td> </tr> </table>	Cost Component	Cost (US\$)	Direct Cost (GIDA estimate) :	834,000	Indirect Cost :	471,000	Physical Contingency :	83,000	Construction Cost	1,388,000											
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Project Area	<table border="0"> <tr> <td>Potential Area</td> <td>103 ha</td> <td>Developed Area</td> <td>23 ha (existing)</td> </tr> <tr> <td>Existing Irrigation Area</td> <td>0 ha</td> <td>Request Area</td> <td>80 ha</td> </tr> </table>	Potential Area	103 ha	Developed Area	23 ha (existing)	Existing Irrigation Area	0 ha	Request Area	80 ha													
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Number of Beneficiaries	300 farmers (Male40%, Female 60%)																					
Investigation Results	The project was commenced in 2001. By the expire date of AfDB loan in 2006, many components of construction works remained uncompleted.																					
Irrigation System	After pumping up irrigation water, it once is stored in a regulating pond called "Night Storage Reservoir". From the reservoir, secondary canals convey the water by gravity.																					
Present Status of Agriculture	Vegetables grew in the existing farmland at present. In the project plan,																					
Accessibility	The project is located within three-hour driving distance from Accr. From trunk road to the site, a dirt road runs for a distance of 7 km along the Angor river.																					
Findings	<p>The project has not yet completed. Resons of the problem are :</p> <ul style="list-style-type: none"> <li>▪ Lack of knowledge and poor financial background of the Contractor,</li> <li>▪ Unuse of farmland due to delayed supplying of pump units,</li> <li>▪ Poor construction supervision, and</li> <li>▪ Unuse of farmland due to delayed dispachment of pump units.</li> </ul>																					
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Persons Contacted	<table border="0"> <thead> <tr> <th>Name</th> <th>Position</th> <th>Position</th> </tr> </thead> <tbody> <tr> <td>Togbe Vigbeshor Agah V</td> <td>-</td> <td>Divisional Chief</td> </tr> <tr> <td>Zekpator Femeysor</td> <td>-</td> <td>Stool Father</td> </tr> <tr> <td>Julius Kwao</td> <td>-</td> <td>IFA Secretary</td> </tr> <tr> <td>Togbe Kpalam II</td> <td>-</td> <td>Development Chief / IFA Chairman</td> </tr> <tr> <td>Doe James</td> <td>-</td> <td>Assemblyman</td> </tr> <tr> <td>Suglo Mawu</td> <td>-</td> <td>Member</td> </tr> </tbody> </table>	Name	Position	Position	Togbe Vigbeshor Agah V	-	Divisional Chief	Zekpator Femeysor	-	Stool Father	Julius Kwao	-	IFA Secretary	Togbe Kpalam II	-	Development Chief / IFA Chairman	Doe James	-	Assemblyman	Suglo Mawu	-	Member
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<b>3. Dordoekope 2 Scheme (Site of AfDB-SSDIP)</b>			
			
<p>Pump Station of the Dordoekope2 Scheme Slope protection for suction sump would be necessary.</p>	<p>Dordoekope2 on the right, and pump station of the Ada scheme on the left under SFIP program In case that the Ada scheme would start irrigation in advance to the Dordoekope2 scheme without completion, social problem might be happened between to water users.</p>		
			
<b>Night Storage Reservoir unused</b>			
	<p>Existing Farmland: Farmers used plastic tank to supply irrigation water for vegetable.</p>		<p>Intake of Secondary Canal One secondary canal was left uncompleted.</p>
	<p>Completed Secondary Canal And unused farmland without land consolidation</p>		<p>Interview with Farmers' Organization</p>

### Project Investigation Sheet (4)

Project Title	<b>AGORVEME Scheme (Site of AfDB SSID)</b>										
Project Location	Volta Region, North Tongu, Agoverme village										
Date of Investigation	July 20 <sup>th</sup> , 2010										
Request by Agency	- Land reclamation (80 ha) - Completion of Secondary Canals, Construction of Tertiary Canals										
Estimated Project Cost (Estimate by study team based on the GIDA estimate)	<table border="0"> <thead> <tr> <th>Cost Component</th> <th>Cost (US\$)</th> </tr> </thead> <tbody> <tr> <td>Direct Cost (GIDA estimate) :</td> <td>452,000</td> </tr> <tr> <td>Indirect Cost :</td> <td>268,000</td> </tr> <tr> <td><u>Physical Contingency</u> :</td> <td><u>45,000</u></td> </tr> <tr> <td>Construction Cost</td> <td>765,000</td> </tr> </tbody> </table>	Cost Component	Cost (US\$)	Direct Cost (GIDA estimate) :	452,000	Indirect Cost :	268,000	<u>Physical Contingency</u> :	<u>45,000</u>	Construction Cost	765,000
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Project Area	<table border="0"> <tr> <td>Potential Area</td> <td>109 ha</td> <td>Developed Area</td> <td>109 ha</td> </tr> <tr> <td>Existing Irrigation Area</td> <td>25 ha</td> <td>Request Area</td> <td>- ha</td> </tr> </table>	Potential Area	109 ha	Developed Area	109 ha	Existing Irrigation Area	25 ha	Request Area	- ha		
Potential Area	109 ha	Developed Area	109 ha								
Existing Irrigation Area	25 ha	Request Area	- ha								
Number of Beneficiaries	91 farmers (Male 53, Female 38)										
Investigation Results	Construction works of secondary and tertiary canals has remained uncompleted and system has not yet started operation.										
Irrigation System	The project has conducted restoration works of completed canals such as falling down of block canal section. The pump station has not tested because of delayed distribution of pump units.										
Present Status of Agriculture	After pumping up irrigation water, it once is stored in a regulating pond called "Night Storage Reservoir". From the reservoir, secondary canals convey the water by gravity.										
Accessibility	Cultivation has not yet commenced.										
Findings	<p>The project is located at a distance of 10 km from Juapong to the southeast on left bank of the lower Volta river. The road is unpaved with dirt surface.</p> <ul style="list-style-type: none"> <li>Poor management of progress and quality controls <ul style="list-style-type: none"> <li>The main reason for unused farmland was delayed supplying of pump units and their installation.</li> <li>Restoration of canals caused by lack of experience in design works and construction manners.</li> </ul> </li> <li>Lack of coordination between Civil works and Procurement of Pumps <ul style="list-style-type: none"> <li>In the case that defects of construction works was found, the works to be rehabilitated wasn't able to be restored because of expiration of guarantee period of one year by the contractor.</li> <li>In the SSIDP, contractors of civil works and pump supplier were different. This made coordination between them difficult.</li> </ul> </li> </ul>										
Data/Information Collected	-										
Persons Contacted	 <p>and others.</p>										

### 4. Agorveme Scheme (Site of AfDB-SSDIP)



Volta river and Pump Station: Suction pump was covered with water grasses.  
The project was ready for testing operation.



Night Storage Reservoir covered with grasses due to un-use for long time



Unused Farmland without land consolidation



Intake for Tertiary Canal  
Canal related structures are constructed with concrete blocks.



Cross Regulator:  
Canal wall on left side is thick because of restoration works after falling down.



Interview with Farmers' Organization

### Project Investigation Sheet (5)

Project Title	<b>ASHAIMAN Irrigation Project</b>																
Project Location	Great Accra Region, Boundary of Tema township																
Date of Investigation	July 21 <sup>st</sup> , 2010																
Request by Agency	Rehabilitation on the Right Bank Area - Main Canal (3.4 km) with a syphon structure - Secondary canals - Spillway of Reservoir - Main Drainage Canal (Dredging, 3.04 km)																
Estimated Project Cost (Estimate by study team)	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Cost Component</th> <th style="text-align: right;">Cost (US\$)</th> </tr> </thead> <tbody> <tr> <td>Rehabilitation of right bank area</td> <td style="text-align: right;">790,000</td> </tr> <tr> <td>Emergency Restoration Works*</td> <td style="text-align: right;">356,000</td> </tr> <tr> <td>Staff Training</td> <td style="text-align: right;">10,000</td> </tr> <tr> <td><u>Total of Direct Construction Cost</u></td> <td style="text-align: right;"><u>1,156,000</u></td> </tr> <tr> <td>Indirect Cost</td> <td style="text-align: right;">637,000</td> </tr> <tr> <td><u>Physical Contingency</u></td> <td style="text-align: right;"><u>115,000</u></td> </tr> <tr> <td>Construction Cost</td> <td style="text-align: right;">1,908,000</td> </tr> </tbody> </table> <p>(Cost estimate of restoration works was prepared by Ashaiman office)</p>	Cost Component	Cost (US\$)	Rehabilitation of right bank area	790,000	Emergency Restoration Works*	356,000	Staff Training	10,000	<u>Total of Direct Construction Cost</u>	<u>1,156,000</u>	Indirect Cost	637,000	<u>Physical Contingency</u>	<u>115,000</u>	Construction Cost	1,908,000
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Project Area	<table style="width: 100%; border-collapse: collapse;"> <tr> <td>Potential Area</td> <td style="text-align: right;">155 ha</td> <td>Developed Area</td> <td style="text-align: right;">155 ha</td> </tr> <tr> <td>Existing Irrigation Area</td> <td style="text-align: right;">56 ha</td> <td>Request Area</td> <td style="text-align: right;">99 ha</td> </tr> </table>	Potential Area	155 ha	Developed Area	155 ha	Existing Irrigation Area	56 ha	Request Area	99 ha								
Potential Area	155 ha	Developed Area	155 ha														
Existing Irrigation Area	56 ha	Request Area	99 ha														
Number of Beneficiaries	93 farmers (Establishment in 1991, Registration in 1997)																
Investigation Results	<p>This is a gravity irrigation project completed in 1968. Water source is the Ashaiman reservoir with an effective storage volume of 5.2 MCM,</p> <p>JICA has involved the strengthening of the project as an irrigation center in opening of the "Irrigation Development Center, IDC" and in preparation of training programs for farmers.</p> <p>The reservoir supplies irrigation water by gravity to the left bank (56ha) and to the right bank (99ha), respectively.</p> <p>The left bank system is in operation because of rehabilitation by Japanese grant aid, however, the right main canal system was unoperational due to deterioration of the facilities.</p> <p>Mai Crop is Paddy.</p> <p>Social infrastructures are well developed.</p> <p>The project site is located at a distance of 26 km from Accra, and Tema town is adjacent to the project site. Accessibility is good.</p>																
Findings	<ul style="list-style-type: none"> <li>▪ Contamination of irrigation water would become a problem because of urbanization of lakeside and left bank area.</li> <li>▪ The right main canal system would require comprehensive rehabilitation works after confirming the present storage capacity of the reservoir.</li> <li>▪ In addition, the project plays a role of a center for training of farmers and for development and popularization of irrigation technology.</li> </ul>																

Data/Information Collected	-																																																																	
Persons Contacted	<table border="1"> <thead> <tr> <th data-bbox="592 315 922 353">NAME</th> <th data-bbox="922 315 1102 353">INSTITUTION</th> <th data-bbox="1102 315 1390 353">POSITION</th> </tr> </thead> <tbody> <tr> <td>1. Nii For Hanson.</td> <td>A.I.S.</td> <td>Ag. Science Mgr.</td> </tr> <tr> <td>2. Charles N. Adoku</td> <td>GIDA/IDC</td> <td>Sup. Agronomist.</td> </tr> <tr> <td>3. Hope Afe do</td> <td>A.I.F.C.S.</td> <td>Executive Member</td> </tr> <tr> <td>4. Freeman Dagadu</td> <td>✓</td> <td>Vice President.</td> </tr> <tr> <td>5. Dickson Arhiv</td> <td>✓</td> <td>President.</td> </tr> <tr> <td>6. J.K. Okyere</td> <td>✓</td> <td>Secretary.</td> </tr> <tr> <td>7. Anthony Asante</td> <td>✓</td> <td>Treasurer.</td> </tr> <tr> <td>8. Robert Kwofie</td> <td>✓</td> <td>Organiser.</td> </tr> <tr> <td>9. Paul A. Asante</td> <td>✓</td> <td>Executive Member.</td> </tr> <tr> <td>10 Juliet Lithur</td> <td>GIDA/IDC</td> <td>Agronomist</td> </tr> <tr> <td>11 George Boy Twumasi</td> <td>GIDA/IDC</td> <td>Asst. Agronomist</td> </tr> <tr> <td>12 Maq Kotetkar Anon</td> <td>GIDA/IDC</td> <td>Asst. Agronomist</td> </tr> <tr> <td>13 Kibbiom Twum</td> <td>GIDA/IDC</td> <td>Technician Engineer</td> </tr> <tr> <td>14 Promise Amegah</td> <td>GIDA/IDC</td> <td>Technician Engineer</td> </tr> <tr> <td>15 Richard Letsu</td> <td>Farmer's Bank</td> <td>clerk</td> </tr> <tr> <td>16. Bons-Akenti</td> <td>GIDA/IDC</td> <td>Chief Tech. Officer</td> </tr> <tr> <td>17 Nyarku Courage.</td> <td>Student.</td> <td>Attachment</td> </tr> <tr> <td>18) Adonu Samuel.</td> <td>Student.</td> <td>Attachment</td> </tr> <tr> <td>19. Agyemang Daniel</td> <td>Student</td> <td>Attachment</td> </tr> <tr> <td>20. Ameyaw Maame Ama K.</td> <td>Student</td> <td>Attachment</td> </tr> </tbody> </table>			NAME	INSTITUTION	POSITION	1. Nii For Hanson.	A.I.S.	Ag. Science Mgr.	2. Charles N. Adoku	GIDA/IDC	Sup. Agronomist.	3. Hope Afe do	A.I.F.C.S.	Executive Member	4. Freeman Dagadu	✓	Vice President.	5. Dickson Arhiv	✓	President.	6. J.K. Okyere	✓	Secretary.	7. Anthony Asante	✓	Treasurer.	8. Robert Kwofie	✓	Organiser.	9. Paul A. Asante	✓	Executive Member.	10 Juliet Lithur	GIDA/IDC	Agronomist	11 George Boy Twumasi	GIDA/IDC	Asst. Agronomist	12 Maq Kotetkar Anon	GIDA/IDC	Asst. Agronomist	13 Kibbiom Twum	GIDA/IDC	Technician Engineer	14 Promise Amegah	GIDA/IDC	Technician Engineer	15 Richard Letsu	Farmer's Bank	clerk	16. Bons-Akenti	GIDA/IDC	Chief Tech. Officer	17 Nyarku Courage.	Student.	Attachment	18) Adonu Samuel.	Student.	Attachment	19. Agyemang Daniel	Student	Attachment	20. Ameyaw Maame Ama K.	Student	Attachment
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### 5. Ashaiman Irrigation Project



Ashaiman Reservoir : Many houses close to the lakeside.



Deteriorated Spillway of the Reservoir (Right bank of the reservoir)



Right Main Canal in Operation



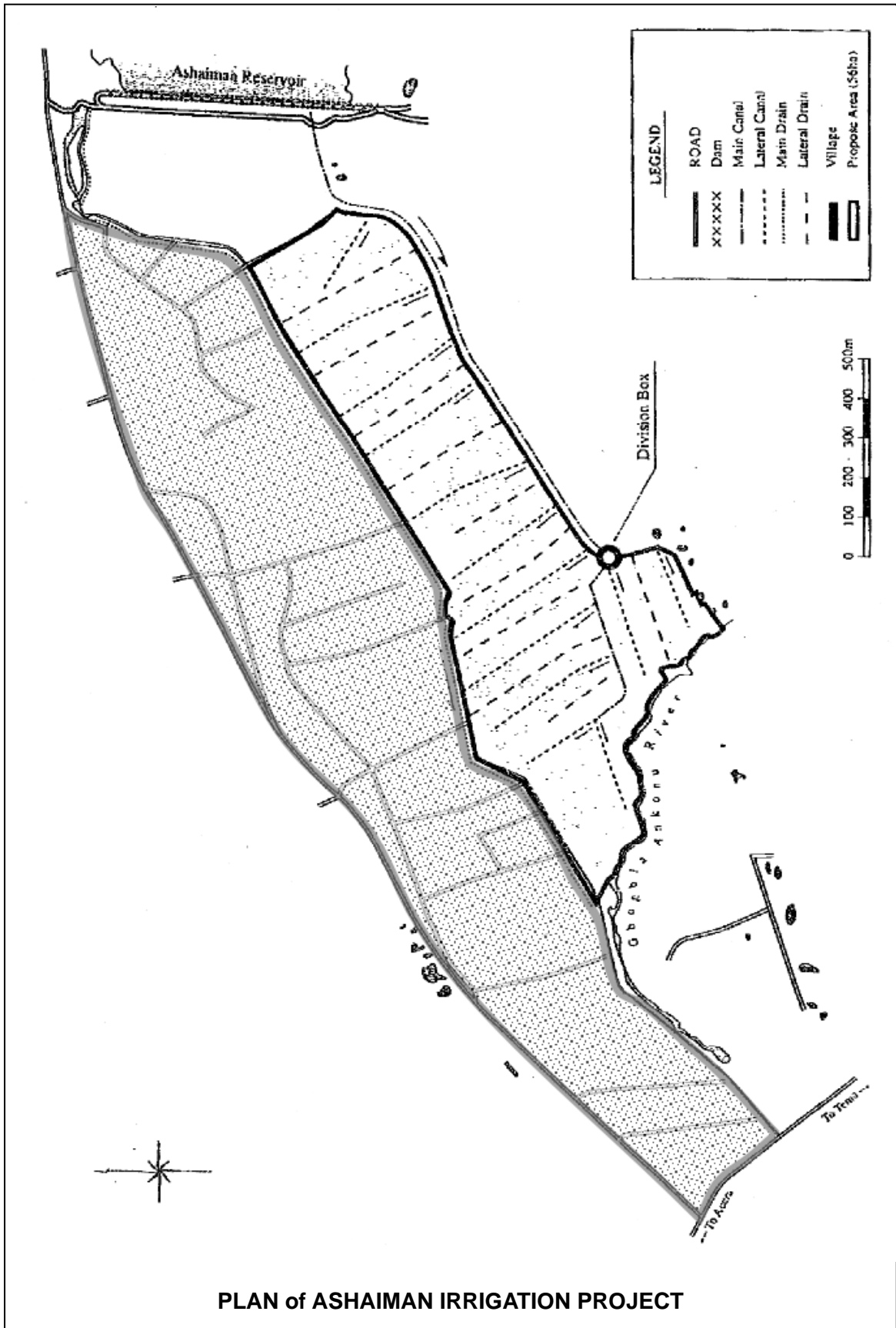
Experimental Farm  
Drip Irrigation system was demonstrated.



Left Main Canal at the location of the crossing point with Main Drainage Canal  
Protections were washed out.



Left bank area unused



### Project Investigation Sheet (6)

Project Title	<b>DAWHENYA Irrigation Project</b>																						
Project Location	Greater Accra Region, Dangme District, Dawhnya village																						
Date of Investigation	July 21 <sup>st</sup> , 2010																						
Request by Agency	<ul style="list-style-type: none"> <li>- Levee raising, rehabilitation of spillway</li> <li>- Development of new area (200 ha)</li> <li>- Rehabilitation of farm roads (10.9 km)</li> <li>- Rehabilitation of secondary canals (11 km)</li> <li>- Supply of post-harvesting machinery</li> <li>- Rehabilitation of training facilities</li> </ul>																						
Estimated Project Cost (Estimate by study team)	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Cost Component</th> <th style="text-align: right;">Cost (US\$)</th> </tr> </thead> <tbody> <tr> <td>Levee raising</td> <td style="text-align: right;">4,610,000</td> </tr> <tr> <td>Development of new area</td> <td style="text-align: right;">1,600,000</td> </tr> <tr> <td>Rehab. of farm roads</td> <td style="text-align: right;">580,000</td> </tr> <tr> <td>Rehab. of 2nd canals</td> <td style="text-align: right;">300,000</td> </tr> <tr> <td>Rehab. training facilities</td> <td style="text-align: right;">37,000</td> </tr> <tr> <td><u>Staff Training</u></td> <td style="text-align: right;"><u>10,000</u></td> </tr> <tr> <td><b>Total of Direct Cost</b></td> <td style="text-align: right;"><b>7,137,000</b></td> </tr> <tr> <td>Indirect Cost</td> <td style="text-align: right;">3,413,000</td> </tr> <tr> <td><u>Physical Contingency</u></td> <td style="text-align: right;"><u>714,000</u></td> </tr> <tr> <td><b>Construction Cost</b></td> <td style="text-align: right;"><b>11,264,000</b></td> </tr> </tbody> </table>	Cost Component	Cost (US\$)	Levee raising	4,610,000	Development of new area	1,600,000	Rehab. of farm roads	580,000	Rehab. of 2nd canals	300,000	Rehab. training facilities	37,000	<u>Staff Training</u>	<u>10,000</u>	<b>Total of Direct Cost</b>	<b>7,137,000</b>	Indirect Cost	3,413,000	<u>Physical Contingency</u>	<u>714,000</u>	<b>Construction Cost</b>	<b>11,264,000</b>
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Project Area	<table style="width: 100%; border-collapse: collapse;"> <tr> <td>Potential Area</td> <td style="text-align: center;">450 ha</td> <td>Developed Area</td> <td style="text-align: center;">200 ha</td> </tr> <tr> <td>Existing Irrigation Area</td> <td style="text-align: center;">80 ha</td> <td>Request Area</td> <td style="text-align: center;">200 ha</td> </tr> </table>	Potential Area	450 ha	Developed Area	200 ha	Existing Irrigation Area	80 ha	Request Area	200 ha														
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Existing Irrigation Area	80 ha	Request Area	200 ha																				
Number of Beneficiaries	235 farmers (Male 193, Female 42), FO was established in 1971																						
Investigation Results	This is a pump irrigation project with a reservoir (effective storage of 4.6 MCM) completed in 1978. The oldest water users' group was established in Ghana. The organization, however, has been reducing its numbers after stopping operation of pump station. Many members of farmers' group have left the farmlands to seek jobs in urban area.																						
Irrigation System	After pumping up irrigation water, it is stored in the Night Storage Reservoir with a storage capacity of 22,000 m <sup>3</sup> . From the reservoir, canal system conveys irrigation water by gravity. At present, farmers operate small pumps instead of the broken pump station.																						
Present Status of Agriculture	Double cropping of rice is practicing. Unit yield reaches to 6.7 ton/ha.																						
Accessibility	The project area faces to the Aflao-Accra trunk road, and has an exhibition effect.																						
Findings	<ul style="list-style-type: none"> <li>• Raising of levee was requested by farmers' group to increase storage capacity for additional irrigation area of 200ha. In order to judge possibility of levee raising, hydrological analysis and topographic survey would be necessary.</li> <li>• Replacement of pump station would be required in consideration of the water level after raising of the levee</li> <li>• Although movement by car was possible at the time of investigation in July, many depressions and deteriorated road sections were observed. Rehabilitation of farm roads would be required.</li> </ul>																						

	<ul style="list-style-type: none"> <li>The irrigation system is still in operation. However, the system would require rehabilitation because of old construction of 42 years ago.</li> </ul>
Data Collected	-
Persons Contacted	<p><u>2/27/2010 Attendants</u></p> <ol style="list-style-type: none"> <li>1. Nene Gyebi II Executive of coop.</li> <li>2. Richard Aftel "</li> <li>3. Diana Valentine "</li> <li>4. David Martey "</li> <li>5. Nicholas Gyedu Project Manager</li> <li>6. Philomena Tunkson Engineer GIDA</li> <li>7. Bonita Danni Engineer GIDA.</li> </ol>

## 6. Dawheya Irrigation Project



Pump station is not in use because of deterioration.



Farmers' own pump installed at suction sump of existing station



Night Storage Reservoir: From the reservoir, irrigation water is distributed by gravity.



Existing canal originated from the Night Storage Reservoir



Secondary Canal in Use




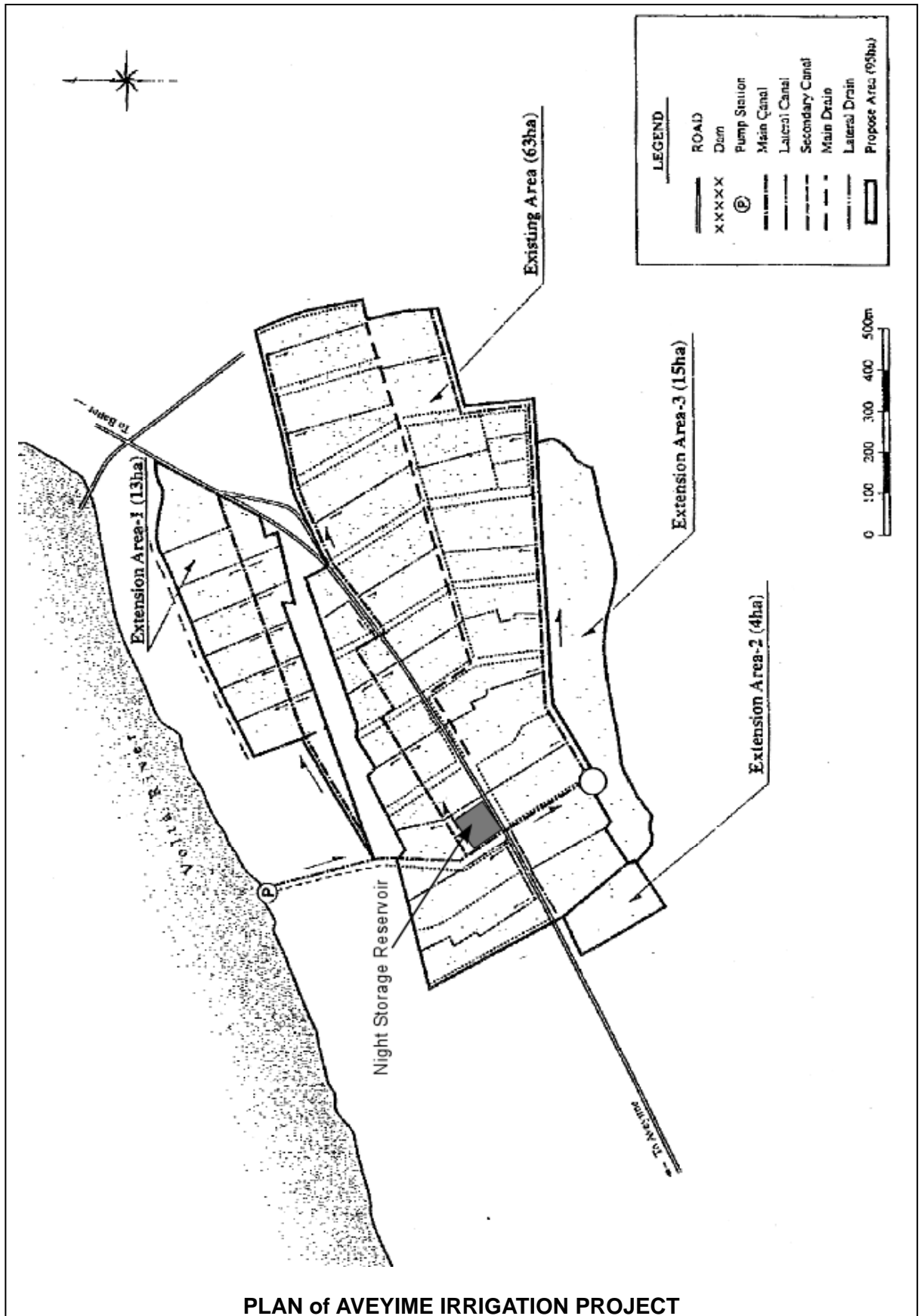
Paddy field irrigated by farmers by themselves

### Project Investigation Sheet (7)

Project Title	<b>AVEYIME Irrigation Project</b>			
Project Location	Volta Region, North Battor District, Aveyime village			
Date of Investigation	July 22 <sup>nd</sup> , 2010			
Request by Agency	<ul style="list-style-type: none"> <li>- Land reclamation</li> <li>- New Development of 60 ha</li> <li>- Regulator</li> <li>- lining of the Night Storage Reservoir</li> <li>- Drying yard construction, Farmers office</li> </ul>			
Estimated Project Cost (Estimate by study team)	Cost Component		Cost (US\$)	
	Land reclamation	:	105,000	
	New development	:	585,000	
	Regulator	:	33,000	
	Post harvesting equipment	:	63,000	
	<u>Staff Training</u>	:	<u>10,000</u>	
	<u>Total of Direct Cost</u>		<u>796,000</u>	
	Indirect Cost	:	451,000	
	<u>Physical Contingency</u>	:	<u>80,000</u>	
	Construction Cost		1,327,000	
Project Area	Potential Area	120 ha	Developed Area	60 ha
	Existing Irrigation Area	0 ha	Requested Area	60 ha
Number of Beneficiaries	84 Farmers, FO : established in 1990, Reorganized in 2005 by SSIAP			
Investigation Results	<p>This is a pump irrigation system completed in 1975. The water source is the lower Volta river. Japan was involved in the initial construction stage, and JICA studied the feasibility of rehabilitation of the project in 1997.</p> <p>In these circumstances, the irrigation system was abandoned because of breakdown of pumps in 1998. After that, the project was rehabilitated by AgSSIP (World Bank program) in 2005. Unfortunately, the project has not yet commenced irrigation services due to delay of delivery of pump units.</p>			
Irrigation System	<p>After pumping up irrigation water, it once is stored in a regulating pond called "Night Storage Reservoir". From the reservoir, main and secondary canals convey the water by gravity.</p>			
Present Status of Agriculture	<p>Target crop is paddy, however, cultivation has not yet started.</p>			
Accessibility	<p>The project site is located at three-hour driving distance from Accra via Sege. National road runs from Accra to Sege, and a road with asphalt pavement connects Sege and the site spreading along the lower volta river.</p> <p>The road condition is good.</p>			
Others	<p>In the vicinity area, a private farm named "Prairie Volta Ltd." cultivates 200 ha of paddy.</p>			
Findings	<ul style="list-style-type: none"> <li>▪ Testing of pump system has not executed since completion of civil works in 2006 because of delayed supply of pump units. For this reason, cultivation has not yet started.</li> <li>▪ Irrigation facilities are left unused.</li> <li>▪ Bidding of civil works and procurement of pump were separately carried out, and different contractors succeeded the bidding. This made timely delivery of pumps difficult.</li> </ul>			

	<ul style="list-style-type: none"> <li>Land reclamation is another critical issue. It would not be expected that reclamation would be conducted by farmers where utilization of cattle for working is uncommon.</li> </ul>
Data Collected	1) Welcome address by IFA (A4, 2 sheets)

<b>7. Aveyime Irrigation Project</b>	
	
Pump Station: Test operation has not yet tried.	Suction sump may have sedimentation problem.
	<p>Night Storage Reservoir :</p> <p>From the reservoir, water is delivered by gravity.</p>
	
Main canal: Outlet from the Night Storage Reservoir	Main Canal
	
Main farm road with laterite pavement	Unused Farmland without reclamation works



### Project Investigation Sheet (8)

Project Title	<b>TOKPO Scheme (Site of AfDB SSID)</b>										
Project Location	Greater Accra, Dangbe West District, TOKPO										
Date of Investigation	July 22 <sup>nd</sup> , 2010										
Request by Agency	<ul style="list-style-type: none"> <li>- Completion of project works <ul style="list-style-type: none"> <li>No.2 Night Storage Reservoir</li> <li>Secondary canals No.3 – No.5 (1,570 m)</li> </ul> </li> <li>- Land reclamation (91 ha)</li> <li>- Constructin of farm roads (9.5 km)</li> <li>- Supply of farming machinery for plowing</li> </ul>										
Estimated Project Cost (Study team estimation based on the GIDA estimate)	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Cost Component</th> <th style="text-align: right;">Cost (US\$)</th> </tr> </thead> <tbody> <tr> <td>Direct Cont (GIDA estimate )</td> <td style="text-align: right;">524,000</td> </tr> <tr> <td>Indirect Cost</td> <td style="text-align: right;">307,000</td> </tr> <tr> <td><u>Physical Contingency</u></td> <td style="text-align: right;"><u>52,000</u></td> </tr> <tr> <td>Construction Cost</td> <td style="text-align: right;">883,000</td> </tr> </tbody> </table>	Cost Component	Cost (US\$)	Direct Cont (GIDA estimate )	524,000	Indirect Cost	307,000	<u>Physical Contingency</u>	<u>52,000</u>	Construction Cost	883,000
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Project Area	<table style="width: 100%; border-collapse: collapse;"> <tr> <td>Potential Area</td> <td style="text-align: right;">91 ha</td> <td>Developed Area</td> <td style="text-align: right;">68 ha</td> </tr> <tr> <td>Existing Irrigation Area</td> <td style="text-align: right;">0 ha</td> <td>Requested Area</td> <td style="text-align: right;">91 ha</td> </tr> </table>	Potential Area	91 ha	Developed Area	68 ha	Existing Irrigation Area	0 ha	Requested Area	91 ha		
Potential Area	91 ha	Developed Area	68 ha								
Existing Irrigation Area	0 ha	Requested Area	91 ha								
Number of Beneficiaries	404 farmers (Male 236, Female 168 )										
Investigation Results	<p>This scheme was completed in 2005 under SSIDP of AfDB. Unfortunately, the scheme has not yet started irrigation services.</p> <p><b>Irrigation System</b></p> <p>After pumping up irrigation water, it once is stored in a regulating pond called "Night Storage Reservoir". From the reservoir, conveyance canal and secondary canals deliver the water by gravity.</p> <p>The conveyance canal connect No.1 and No.2 resevoirs.</p> <p><b>Present Status of Agriculture</b></p> <p>Target crops are paddy and vegetables.</p> <p><b>Accessibility</b></p> <p>The project is located at a distance of 10 km from Aveyime to the west. The road is unpaved with dirt surface.</p>										
Findings	<ul style="list-style-type: none"> <li>▪ The project was left uncompleted because of loan expiration. Farmers feel strong indignation with the unfinished situation, because they cooperated with project by not farming during the construction period.</li> <li>▪ Land leveling works was not conducted. This makes cultivation difficult.</li> <li>▪ Land reclamation is another critical issue. It would not be expected that reclamation would be conducted by farmers where utilization of cattle for working is uncommon.</li> </ul>										
Data Collected	Schematic Diagram of the Tokpo Irrigation Project (A4, 1sheet)										

Persons Contacted	<ol style="list-style-type: none"><li>1. Nene Tetteh Minko Animle II - Chief of Tokpo and Dzalete of Osuobren Paramountcy.</li><li>2. Mr M. L. K. Animle - Chairman, IFA - Tokpo</li><li>3. Mr. M. K. (Sokamoto) Animle, Organiser, Tokpo, IFA.</li><li>4. Madam Francisca Animle, Member Tokpo IFA.</li><li>5. Madam Theresa Animle, Member, Tokpo, IFA.</li><li>6. Alice Animle, Member, IFA, Tokpo</li><li>7. Mr Asu Animle, Member IFA Tokpo</li><li>8. Prosper Awutey (Site Supervisor)</li></ol>
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**8. Tokpo Scheme (Site of AfDB-SSDIP)**



The Lower Volta river and Suction sump.



Four pump units are installed.



Night Storage Reservoir No.1



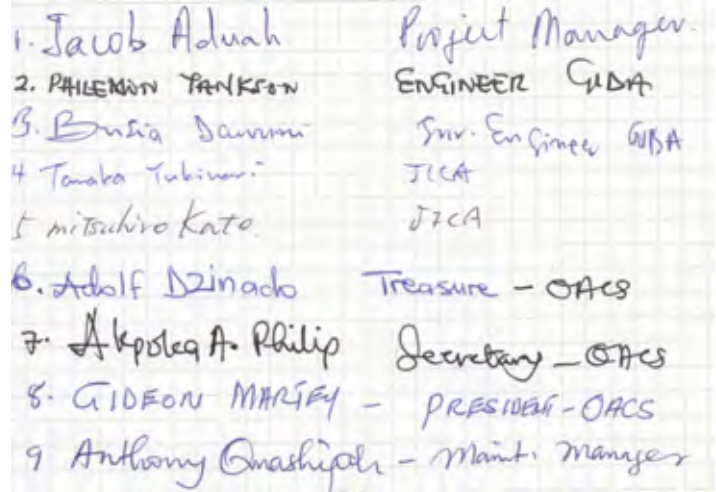
No.1 Secondary canal and its unused commanding area without land reclamation









Completed canals

### Project Investigation Sheet (9)

Project Title	<b>KPONG Irrigation Project</b>																					
Project Location	Greater Accra, Dangme Distirict, Akuse/Asutsuare																					
Date of Investigation	July 23 <sup>rd</sup> , 2010																					
Request by Agency	<ul style="list-style-type: none"> <li>- Dredging of Main Drainage Cnal                      48.4 km</li> <li>- Rehabilitation of Farm Road Network              101.8km</li> <li>- Rehabilitation of secondary and tertiary canals in area A &amp; B</li> <li>- Supply of O&amp;M machinery <ul style="list-style-type: none"> <li>Crawler Excavator (Cat.350) Long Arm                      1</li> <li>Small Crawler Excavator    3</li> <li>Tipper Trucks    4</li> <li>Low Loader Bed &amp; Head    1</li> <li>Heavy Duty Compactor    1</li> </ul> </li> </ul>																					
Estimated Project Cost (Estimate by study team)	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Cost Component</th> <th style="text-align: right;">Cost (US\$)</th> </tr> </thead> <tbody> <tr> <td>Dredging of Main Drain                      :</td> <td style="text-align: right;">5,375,000</td> </tr> <tr> <td>Rehabilitation of Road                      :</td> <td style="text-align: right;">5,300,000</td> </tr> <tr> <td>O&amp;M machinery                      :</td> <td style="text-align: right;">1,000,000</td> </tr> <tr> <td><u>Staff Training</u>                      :</td> <td style="text-align: right;"><u>10,000</u></td> </tr> <tr> <td><u>Total of Direct Cost</u></td> <td style="text-align: right;"><u>11,685,000</u></td> </tr> <tr> <td>Indirect Cost                      :</td> <td style="text-align: right;">5,376,000</td> </tr> <tr> <td><u>Physical Contingency</u>                      :</td> <td style="text-align: right;"><u>1,168,000</u></td> </tr> <tr> <td>Construction Cost</td> <td style="text-align: right;">18,230,000</td> </tr> </tbody> </table>				Cost Component	Cost (US\$)	Dredging of Main Drain                      :	5,375,000	Rehabilitation of Road                      :	5,300,000	O&M machinery                      :	1,000,000	<u>Staff Training</u> :	<u>10,000</u>	<u>Total of Direct Cost</u>	<u>11,685,000</u>	Indirect Cost                      :	5,376,000	<u>Physical Contingency</u> :	<u>1,168,000</u>	Construction Cost	18,230,000
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<u>Physical Contingency</u> :	<u>1,168,000</u>																					
Construction Cost	18,230,000																					
Project Area	Potential Area              3,028 ha	Developed Area              2,786 ha																				
	Existing Irrigation Area      2,200 ha	Irrigated Paddy Field      1,867 ha																				
Number of Beneficiaries	2,500 persos (Male 1,750, Female 750) Under the "Osudoku Agricultural Cooperative Society Ltd.", WUAs are established in each secondary canal. (18 canals)																					
Investigation Results	When the project was completed in 1968, it was a pump irrigation scheme. After that, the irrigation method was changed from pumping to gravity in 2003 when the extension project completed with the financial supports by AfDB, BADEA, etc. Consequently, water source also changed from the lower Volta river to the Kpong Reservoir (190 MCM).																					
Irrigation System	The gravity irrigation system supplies water from the Kpong Reservoir through the Akusu Main Canal. For the private Banana plantation area on the hilly land, a pump station is constructed to take water from the main canal.																					
Present Status of Agriculture	Drainage system in the old development area in 1968 loses its function because of sedimentation of many years. In addition, some secondary canals have problems of reduction of their canal sections by sedimentation.																					
O&M Status	Main crops are paddy and vegetables.																					
	Operation and maintenance cost is born from water charge collected from beneficiaries. The amount is as follows :																					
	Land use fee    =    US\$150/ha																					
	Water fee        =    GHc120/crop																					
	Collection rate is low at 40%. O&M activities are rather inactive because of breakdown of O&M machineries.																					
Accessibility	The project site is located at a distance of 61km from ACCRA. From Accra to Kpong , a national road runs, and asphalt paved road connects the site to Kpong. Accessibility is good.																					

Others	<p>In the project area, a private farm "Golden Exotic Ltd. " plants banana in the area of 1,400 ha.</p> <p>The Kpong Reservoir has dual purposes of irrigation and hydropower generation. Though priority is given to hydropower generation, no shortage of irrigation water has been reported.</p> <p>As for the potential area of 5,000ha on left bank, MiDA conducted F/S study for the area of 2,000ha. An intake structure for the left bank area exists on the left of the Kpong dam body.</p>
Findings	<ul style="list-style-type: none"> <li>• The main work of the project is dredging of the Main Drainage Canal.</li> <li>• The project requests rehabilitation of road network. Accessibility of main and secondary roads in the rainy season would be problems.</li> <li>• It seems that bridges across the main canal lack in number for farming and daily life of farmers.</li> </ul>
Data Collected	<ol style="list-style-type: none"> <li>1) Kpong Irrigation Project Pamphlet (A4, 1 Sheet, Both side copy)</li> <li>2) Proposed Rehabilitation Works (A4, 1 Sheet)</li> </ol>
Persons Contacted	 <p>Handwritten list of persons contacted:</p> <ol style="list-style-type: none"> <li>1. Jacob Aduah - Project Manager</li> <li>2. PHILEMON PANKSON - ENGINEER GIDA</li> <li>3. Bontia Dammu - Sr. Engineer GIDA</li> <li>4. Tanaka Yukimori - JICA</li> <li>5. mitsuhiko kato - JICA</li> <li>6. Adolf Dinado - Treasure - OACS</li> <li>7. Akpoteq A. Philip - Secretary - OACS</li> <li>8. GIDEON MARLEY - PRESIDENT - OACS</li> <li>9. Anthony Onashigah - Maint. Manager</li> </ol>

<h2 style="text-align: center;">9. Kpong Irrigation Scheme</h2>	
	<p>Intake structure of Akusu Main Canal and Crest of the Kpong Dam</p>
	<p>Distant View of the Kpong Powerhouse Intake structure of the left bank canal is located at opposite side of the powerhouse.</p>
	
<p>Beginning point of the Akusu Main Canal of the Kpong Irrigation Project (Over the parking space)</p>	<p>Akusu Main Canal (Right bank is eroded by flood flow from outside of the project.)</p>
	
<p>Main Drainage Canal buried by grasses and sedimentation</p>	<p>Poor drainage area in the rainy season</p>

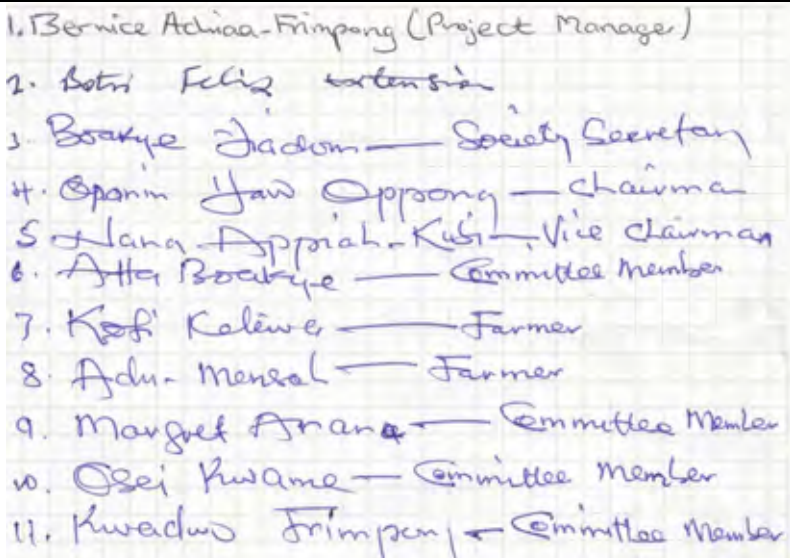


**PLAN of KPONG IRRIGATION PROJECT**

Source : Mott, MacDonald, May 2000 ; *KPONG IRRIGATION PROJECT, IRRIGATION MANAGEMENT AND OPERTAION AND MAINTENANCE REPORT*

### Project Investigation Sheet (10)

Project Title	<b>NOBEWAM (Anum Valley) Irrigation Project</b>																																		
Project Location	Ashanti Region, Ejisu-Juabeng District, Nobewam																																		
Date of Investigation	July 26 <sup>th</sup> , 2010																																		
Request by Agency	<p>A Block</p> <ul style="list-style-type: none"> <li>- Replacement of Pump unit and its electrification</li> <li>- Rehabilitation of link channel due to river course change of the Anumriver</li> <li>- Rehabilitation of farm road</li> <li>- Enlargement of drying yard for paddy</li> <li>- Provision of a rice-milling machine.</li> </ul> <p>B block</p> <ul style="list-style-type: none"> <li>- Replacement of intake gates</li> <li>- Sealing of leakage from the lining canal</li> <li>- Replacement of canal gates</li> <li>- Sealing of leakage water from an aquaduct</li> </ul>																																		
Estimated Project Cost (Estimate by study team)	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Cost Component</th> <th style="text-align: right;">Cost (US\$)</th> </tr> </thead> <tbody> <tr> <td colspan="2"><b>Block-A</b></td> </tr> <tr> <td>Replacement of Pump :</td> <td style="text-align: right;">1,500,000</td> </tr> <tr> <td>Rehabilitation of link channel :</td> <td style="text-align: right;">27,000</td> </tr> <tr> <td>Rehabilitation of farm road :</td> <td style="text-align: right;">657,000</td> </tr> <tr> <td>Enlargement of drying yard :</td> <td style="text-align: right;">53,000</td> </tr> <tr> <td><u>Provision of machine :</u></td> <td style="text-align: right;"><u>50,000</u></td> </tr> <tr> <td><u>Sub Total of A Block</u></td> <td style="text-align: right;"><u>2,287,000</u></td> </tr> <tr> <td colspan="2"><b>Block-B</b></td> </tr> <tr> <td>Replacement of intake gates :</td> <td style="text-align: right;">17,000</td> </tr> <tr> <td>Reconstruction of Aquaduct &amp; Sealing of caals :</td> <td style="text-align: right;">66,000</td> </tr> <tr> <td><u>Staff Training :</u></td> <td style="text-align: right;"><u>10,000</u></td> </tr> <tr> <td><u>Sub Total of B Block</u></td> <td style="text-align: right;"><u>93,000</u></td> </tr> <tr> <td><u>Total of Direct Cost</u></td> <td style="text-align: right;"><u>2,380,000</u></td> </tr> <tr> <td>Indirect Cost :</td> <td style="text-align: right;">1,240,000</td> </tr> <tr> <td><u>Physical Contingency :</u></td> <td style="text-align: right;"><u>238,000</u></td> </tr> <tr> <td><u>Construction Cost</u></td> <td style="text-align: right;"><u>3,858,000</u></td> </tr> </tbody> </table>	Cost Component	Cost (US\$)	<b>Block-A</b>		Replacement of Pump :	1,500,000	Rehabilitation of link channel :	27,000	Rehabilitation of farm road :	657,000	Enlargement of drying yard :	53,000	<u>Provision of machine :</u>	<u>50,000</u>	<u>Sub Total of A Block</u>	<u>2,287,000</u>	<b>Block-B</b>		Replacement of intake gates :	17,000	Reconstruction of Aquaduct & Sealing of caals :	66,000	<u>Staff Training :</u>	<u>10,000</u>	<u>Sub Total of B Block</u>	<u>93,000</u>	<u>Total of Direct Cost</u>	<u>2,380,000</u>	Indirect Cost :	1,240,000	<u>Physical Contingency :</u>	<u>238,000</u>	<u>Construction Cost</u>	<u>3,858,000</u>
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Project Area	<p>Potential Area 140 ha</p> <p>Developed Block-A 40 ha, Block-B 100 ha</p> <p>Existing Irrigation Area Block-A 35 ha Block-B 0 ha</p>																																		
Number of Beneficiaries	70 farmers at present (male 47, Female 23) originally 150 farmers registered FAPIM was signed.																																		
Investigation Results	<p>The project , which consists of two separated projects, was constructed in 1992 with a support of Chinese government.</p> <p>The project has a role of rice-basket in Ashanti region with the largest rice production area</p>																																		
Irrigation System	<p>Block-A, where the site office of GIDA is located, adopts pumping irrigation method. The Anum river as water source changed its flow course recently, and it made pumping difficult. The pump units stopped operations.</p> <p>In this circumstances, farmers who have capital continues irrigation using their own small pumps.</p> <p>Farmers who don't have capital left the village to find income sources. The numbers of farmers decrease to half of the original numbers of 150.</p>																																		

	Gravitational water from the Oweri river headworks irrigates the Block-B area. Unfortunately, the system can not irrigate the commanding areas due to excessive water losses caused by leakage from canals and an aqueduct. Existing irrigation area is under rainfed condition.
Present Status of Agriculture	The main crop is paddy. Unit yield of milled rice reaches to 5.0 ton/ha.
Accessibility	Block-A area faces to the main road of ACCRA-KUMASI, and has an advantage of exhibition effect.  As for Block-B, a 3 km dirt road connects the Nobewam town and the site of headwork. From the headworks, there is no access road to enter the project area. Accessibility is poor.
Others	Members of water users' group pay land use charge to land owner for cultivation. The amount is 50kg of milled rice per 0.4 ha. There are 215 land owners, and a great part of them is old person of the village.
Findings	<ul style="list-style-type: none"> <li>▪ Poor quality of concrete joints causes water leakage from canals and related structures in Block-B.</li> <li>▪ Although Block-B was completed in 1992, facilities have already deteriorated. Total rehabilitation of B-Block may be necessary.</li> <li>▪ In the Block-A, construction of a weir across the Anum river and an intake structure would be crucial to supply stable water to the pump station.</li> <li>▪ For the purpose of O&amp;M activities, rehabilitation of access road to the pump station is required.</li> </ul>
Data Collected	-
Persons Contacted	 <p>1. Bernice Adhiaa-Frimpong (Project Manager)  2. Botri Felix Katsinda  3. Boakye Jaden — Society Secretary  4. Opanin Jaw Oppong — Chairman  5. Nana Appiah-Kubi — Vice Chairman  6. Atta Boakye — Committee Member  7. Kofi Kelwe — Farmer  8. Adu Mensah — Farmer  9. Margaret Anana — Committee Member  10. Osei Kwame — Committee Member  11. Kwadwo Frimpong — Committee Member</p>

### 10. Anum Valley (Nobewan) Irrigation Scheme



Flow of the Anum river:  
Original Flow with a red colored arrow  
Existing Flow with white colored arrow



Block -A: Deteriorated Pump House



Block-A : a Secondary canal with concrete lining



Block-B : Oweri headworks

Gate can't work because of bending of spindle. (see above)

Seals of joints were disappeared. (Left)



### Project Investigation Sheet (11)

Project Title	<b>AKUMADAN Irrigation Project</b>		
Project Location	Ashanti Region, Offinso District, Akumadan : 100km from Kumasi City		
Date of Investigation	July 27 <sup>th</sup> , 2010		
Request by Agency	<ul style="list-style-type: none"> <li>- Rehabilitation of Pipeline system (65 ha)</li> <li>- Removal of water grasses in a reservoir</li> <li>- Rehabilitation of Main farm road</li> <li>- New development of 935 ha A reservoir, two pump stations, Sprinkler system ofr 935 ha</li> <li>- Provision of farm machineries</li> <li>- Farm credit system</li> <li>- Cold storage</li> </ul>		
Estimated Project Cost (Estimate by study team)	Cost Component	Cost (US\$)	
	Rehabilitation of Pipeline	:	8,000
	New development	:	14,180,000
	<u>Staff Training</u>	:	<u>10,000</u>
	<u>Total of Direct Cost</u>		<u>14,198,000</u>
	Indirect Cost	:	6,432,000
	<u>Physical Contingency</u>	:	<u>1,420,000</u>
	Construction Cost		22,050,000
Project Area	Potential Area	1,000 ha	Developed Area 65 ha
	Existing Irrigation Area	44 ha	Requested Area 1,000 ha
Number of Beneficiaries	190 farmers		
Investigation Results	<p>The project, completed in 1977, adopts sprinkler irrigation using pumping water. In 2006, construction works of the project were rehabilitated by financial supports from WB and CIDA. Moreover, provision of pumps were executed by Emix-Bank of India.</p> <p>After installing pump units in 2009, test operation of the system revealed water leakage problem from joint. However, guarantee period of pipeline was expired at that time, the system stopped operation without rehabilitation.</p>		
Irrigation System	<p>Existing system stores water of 5.2 MCM by constructing a weir across the source river. Two pump stations on both banks of the river supply irrigation water to sprinkler system of A and B areas. Irrigation area A of left bank is 20 ha, and that of right bank is 45 ha.</p> <p>A dam instead of weir is scheduled to be constructed for new development area. Basic concept of these system is the same.</p>		
Present Status of Agriculture	<p>Main crop is tomato for processing. The project started tomato production for the Wenchi Tomato Factor, but after closing the factory, farmers lost the market. Recently, new factory was constructed by government with a support from FAO. The farmers in the project area will supply tomato to this factory.</p>		
Accessibility	<p>Other crops cultivated are soybean, groundnut, maize and sorghum.</p> <p>The project area is located at 5 km distance from Akumada. From the Kumasi-Tamale trunk road, a dirt road of 3.5 km connects Akumada and the project site. Road surface is rough.</p>		

Findings	<ul style="list-style-type: none"> <li>▪ A problem of leakage water from joints is serious, but is not difficult to solve. Cost for rehabilitation would not be much.</li> <li>▪ The system is not working.</li> <li>▪ The main cause of this problem would be two separated contracts about the construction works and the procurement of pumps.</li> <li>▪ There is a possibility of insufficiency of water source for new development area. Careful hydrological study would be necessary.</li> <li>▪ In addition, pump head would be high to irrigate new development area. Therefore, careful examination of economic feasibility would be crucial.</li> </ul>																														
Data Collected	1) Akumadan Irrigation Project, Introduction and Challenges (A4 -5 sheets, A3- 1 sheet)																														
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### 11. Akumadan Irrigation Scheme (WB rehabilitation)



Completed Pump station



Two types of pump units were installed because of wrong delivery.



Unused Pump Units caused by wrong delivery



Leakage joint portion (pointed by an blue arrow)



Sprinkler units



Source river for new development area  
Dam will be constructed near this point to irrigate 965 ha.

### Project Investigation Sheet (12)

Project Title	<b>NEW LONGORO Scheme (Site of AfDB SSID)</b>										
Project Location	Brong-Ahafo Region, Kintampo North, New Longoro										
Date of Investigation	July 28 <sup>th</sup> , 2010										
Request by Agency	<ul style="list-style-type: none"> <li>- Lining of Secondary canals (14 out of 17 are not lined)</li> <li>- Land reclamation</li> <li>- Supply of farm machinery</li> <li>- Development of 104 ha</li> </ul>										
Estimated Project Cost (Estimate by study team based on the GIDA estimate)	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Cost Component</th> <th style="text-align: right;">Cost (US\$)</th> </tr> </thead> <tbody> <tr> <td>GIDA Estimate</td> <td style="text-align: right;">1,747,000</td> </tr> <tr> <td>Indirect Cost</td> <td style="text-align: right;">932,000</td> </tr> <tr> <td><u>Physical Contingency</u></td> <td style="text-align: right;"><u>175,000</u></td> </tr> <tr> <td>Construction Cost</td> <td style="text-align: right;">2,854,000</td> </tr> </tbody> </table>	Cost Component	Cost (US\$)	GIDA Estimate	1,747,000	Indirect Cost	932,000	<u>Physical Contingency</u>	<u>175,000</u>	Construction Cost	2,854,000
Cost Component	Cost (US\$)										
GIDA Estimate	1,747,000										
Indirect Cost	932,000										
<u>Physical Contingency</u>	<u>175,000</u>										
Construction Cost	2,854,000										
Project Area	<table style="width: 100%; border-collapse: collapse;"> <tr> <td>Potential Area</td> <td style="text-align: right;">448 ha</td> <td>Developed Area</td> <td style="text-align: right;">344 ha</td> </tr> <tr> <td>Existing Irrigation Area</td> <td style="text-align: right;">0 ha</td> <td>Requested Area</td> <td style="text-align: right;">104 ha</td> </tr> </table>	Potential Area	448 ha	Developed Area	344 ha	Existing Irrigation Area	0 ha	Requested Area	104 ha		
Potential Area	448 ha	Developed Area	344 ha								
Existing Irrigation Area	0 ha	Requested Area	104 ha								
Number of Beneficiaries	360 farmers (Male 299, Female 6) Organization was established in 2005.										
Investigation Results	<p>This project is one of the SSIDP by AfDB. Construction works was commenced in 2001. Today, development of 104 ha out of 448ha and construction of regulating pond have not been executed because of exhaustion of the budget.</p> <p>Fish ponds are constructed in the project area, but they are not in use because of lack of management staff .</p> <p>The is a gravity irrigation project. Over a distance of 4.5km, a main canal conveys irrigation water which is taken in at a weir across the Chiridi river. Water is delivered to 17 secondary canals, and at the same time is stored in a Night Storage Reservoir.</p> <p>According to the project plan, paddy will be planed in an area of 224 ha, and vegetable will be 120 ha. Cultivation has not started due to no reclamation works in the field.</p> <p>The site is located at 1.5 km to the South from New Longoro town. A dirt road with a distance of 1km connects the project area and the trunk road of Techiman-Wa. In the section between the weir and the farmland, there is no access road.</p>										
Findings	<ul style="list-style-type: none"> <li>▪ Judging from interview with farmers in the field, they might not have clear idea about participatory irrigation management. Strengthening of farmers' organization and farmers' training should be promoted.</li> <li>▪ Land reclamation needs to be conducted by the project to start irrigation as early as possible.</li> </ul>										
Data Collected	-										

## 12. New Longoro Scheme (Site of AfDB-SSDIP)



Gravity irrigation by weir system



Main canal starting from the weir



Secondary Canal with lining, and unused farmland




Inland fishery pond : freshwater aquaculture has not yet started due to lack of watchmen.



Secondary canal waiting for lining

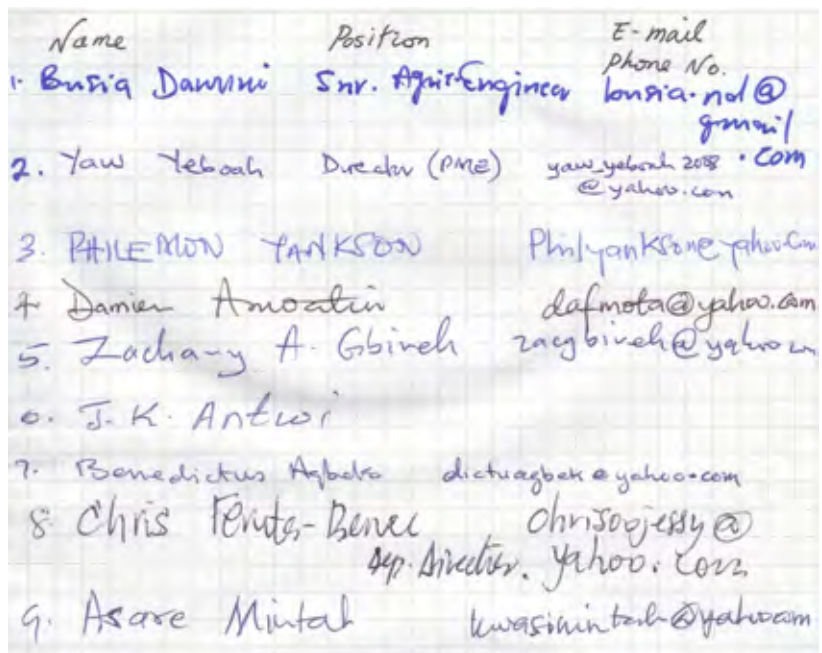
### Project Investigation Sheet (13)

Project Title	<b>DIPALI Scheme (Site of AfDB SSID)</b>								
Project Location	Northern Region, Saveligi-Nanton, Dipali (No.13 on Location Map)								
Date of Investigation	July 28 <sup>th</sup> , 2010								
Request by Agency	<ul style="list-style-type: none"> <li>- Protection works of Suction sump</li> <li>- Installation of submergible motor pump</li> <li>- Lining of secondary canals</li> <li>- Land reclamation</li> </ul>								
Estimated Project Cost	Unidentified								
Project Area	<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Potential Area</td> <td style="width: 30%;">240 ha</td> <td style="width: 30%;">Developed Area</td> <td style="width: 10%;">171 ha</td> </tr> <tr> <td>Existing Irrigation Area</td> <td>0 ha</td> <td>Requested Area</td> <td>0 ha</td> </tr> </table>	Potential Area	240 ha	Developed Area	171 ha	Existing Irrigation Area	0 ha	Requested Area	0 ha
Potential Area	240 ha	Developed Area	171 ha						
Existing Irrigation Area	0 ha	Requested Area	0 ha						
Number of Beneficiaries	140 farmers (Male 90, Female 50)								
Investigation Results	<p>This project is one of the SSID projects completed in 2009. Operation of the project has not yet started due to the remaining works such as installation of submergible pumps and protection works of suction sump.</p> <p>After pumping up irrigation water from the white Volta river, the water is stored in the "Night Storage Reservoir", and then delivered by gravity.~ The main canal is lined with concrete. Water level control structures such as cross regulator and stop log are not provided.</p> <p>Target crop is paddy.</p> <p>Cultivation is limited in the dry season because the field is submerged when the white Volta river raises its water level in the rainy season.</p> <p>The project site is located on left bank of the White Volta river near the Dipali village. A dirt road with a distance of 5 km connects the site and the Tamale-Bolgatanga trunk road. Accessibility is faire.</p>								
Irrigation System									
Present Status of Agriculture									
Accessibility									
Findings	<ul style="list-style-type: none"> <li>▪ NRGF has an intention of finalizing of SSIDP. In this connection, this project is given high priority in its large size.</li> <li>▪ The control house is installed on a small high bank on the riverside. There is a danger that the house would be submersed or be washed out by floods.</li> <li>▪ The size of the "Night Storage Reservoir" seems to be small in comparison with the irrigation area. This may make operation hour of pump long.</li> </ul>								
Data Collected	-								

<b>13. Dipali Scheme (Site of AfDB-SSDIP)</b>	
	
Suction sump of Submergible pumps	Control house on riverside The house would be submersed depending on flood levels.
	
Submergible pumps left near the suction sump	At the endpoint of the Main Canal with concrete lining. There is a extension plan.
	
Secondary canal and intake pipe The pipe has a problem of clogging.	Division box and Farmland The farmland is unused because of no land reclamation works.

### Project Investigation Sheet (14)

Project Title	<b>SANKANA Irrigation Project (Community Management Irrigation Project)</b>								
Project Location	Upper West Region, Nadowli District								
Date of Investigation	July 30 <sup>th</sup> , 2010								
Request by Agency	<ul style="list-style-type: none"> <li>- Increase of spillway capacity</li> <li>- Raising of levee height</li> <li>- Improvement of drainage system</li> <li>- Rehabilitation of canals (Left bank 950m, Right bank 1,000m)</li> <li>- New development of 100 ha and land leveling of 40 ha</li> <li>- Improvement of fishery pond</li> <li>- Rehabilitation of farm road</li> <li>- Construction of WUA Office</li> </ul>								
Estimated Project Cost	Un identified								
Project Area	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Potential Area</td> <td style="width: 33%;">140 ha</td> <td style="width: 33%;">Develped Area</td> <td style="width: 33%;">40 ha</td> </tr> <tr> <td>Existing Irrigation Area</td> <td>20 ha</td> <td>Requested Area</td> <td>100 ha</td> </tr> </table>	Potential Area	140 ha	Develped Area	40 ha	Existing Irrigation Area	20 ha	Requested Area	100 ha
Potential Area	140 ha	Develped Area	40 ha						
Existing Irrigation Area	20 ha	Requested Area	100 ha						
Number of Beneficiaries	<p>156 persons consisting of three groups of Irrigation, Fishery, and Cattle Breeding</p> <ul style="list-style-type: none"> <li>- Sankana Vegetable Growers' Association: 73farmers (Male 48, Female 25)</li> <li>- Fishery Group : 20 fishermen (Male 男 15, Female 5)</li> <li>- Cattle Breeding: 63 members</li> </ul>								
Investigation Results	<p>This is one of the "irrigation pond by community management " schemes constructed in 1960s mainly in the northern regions.</p> <p>This irrigation pond project was completed in 1969. Initial irrigation area was 20 ha, and then the area expanded to 40 ha after developing the left bank area of 20 ha by WUADP. In 1999, pond dyke was rehabilitated by IFAD funds.</p> <p>The left bank area is unused by serious flood damages occurred in 2000. The flood washed out an aquaduct of the main canal.</p> <p>This project supplies water to both bank areas by gravity irrigation system having a irrigation pond with a capacity of 1.5 MCM. The system also supplies water to fishery ponds in the project area.</p> <p>Main crops are Tomato, Okra, etc.</p> <p>The project site is located near Sankana village, 5 km to the west from the trunk road.</p> <p>Farmers training program, which consists of the river basin management, dam body maintenance, water management, improvement of freshwater aquaculture techniques, and strengthening of organization under Global Water Initiative supported by CRS and CARE, is going on.</p>								
Irrigation System									
Present Status of Agriculture									
Accessibility									
Others									
Findings	<ul style="list-style-type: none"> <li>▪ The dyke is in good condition due to rehabilitaion works and maintenance activities.</li> <li>▪ There was a danger of collapse of the dyke by overflow in 2007. To prevent dyke collapse, farmers have an intention of increase of the levee height and the spillway capacity.</li> <li>▪ The farmers' request is reasonable in consideration of magnitude of dyke collapse.</li> <li>▪ Canals need rehabilitation.</li> <li>▪ To supply water safely to left bank area and keep spillway capacity,</li> </ul>								

	construction of syphon instead of new aquaduct is recommendable.																														
Data Collected	Sankana Irrigation Project Main Feature (A4, 1 sheet) by GIDA Regional Office																														
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### 14. Sankana Irrigation Project (Community Management Scheme)



Irrigation Pond rehabilitated in 1999



Spillway:

Repair works of concrete patching were carried out by WUA on the right bank.



Left Main Canal:

Aqueduct on the main canal was washed out by flood in 2007.



Right Main Canal:

Maintenance activities are done before starting irrigation.

### Project Investigation Sheet (15)

Project Title	<b>TONO Irrigation Project</b>																					
Project Location	Upper East Region, Bolgatanga District, Tono																					
Date of Investigation	August 2 <sup>nd</sup> , 2010																					
Request by Agency	<ul style="list-style-type: none"> <li>- Lining of secondary canals (Lateral 56km+Sub-Lateral 110 km)</li> <li>- Dredging of main drainage canal (40 km)</li> <li>- Reconstruction of pump station ( B, O areas of 400 ha)</li> <li>- Rehabilitation of farm road network (120 km)</li> <li>- Supply of farm machinery</li> </ul>																					
Estimated Project Cost (Estimate by study team)	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Cost Component</th> <th style="text-align: right;">Cost (US\$)</th> </tr> </thead> <tbody> <tr> <td>Lining</td> <td style="text-align: right;">3,042,000</td> </tr> <tr> <td>Dredging of main drain</td> <td style="text-align: right;">4,443,000</td> </tr> <tr> <td>Reconstruction of pump</td> <td style="text-align: right;">1,500,000</td> </tr> <tr> <td><u>Rehabilitation of farm road</u></td> <td style="text-align: right;"><u>2,565,000</u></td> </tr> <tr> <td><u>Total of Direct Cost</u></td> <td style="text-align: right;"><u>11,550,000</u></td> </tr> <tr> <td>Indirect Cost</td> <td style="text-align: right;">5,320,000</td> </tr> <tr> <td><u>Physical Contingency</u></td> <td style="text-align: right;"><u>1,155,000</u></td> </tr> <tr> <td><b>Construction Cost</b></td> <td style="text-align: right;"><b>18,025,000</b></td> </tr> </tbody> </table>				Cost Component	Cost (US\$)	Lining	3,042,000	Dredging of main drain	4,443,000	Reconstruction of pump	1,500,000	<u>Rehabilitation of farm road</u>	<u>2,565,000</u>	<u>Total of Direct Cost</u>	<u>11,550,000</u>	Indirect Cost	5,320,000	<u>Physical Contingency</u>	<u>1,155,000</u>	<b>Construction Cost</b>	<b>18,025,000</b>
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<b>Construction Cost</b>	<b>18,025,000</b>																					
Project Area	Potential Area	3,840 ha	Developed Area	2,490 ha																		
	Existing Irrigation Area	2,023 ha	Requested Area	500 ha																		
Number of Beneficiaries	4000 persons (Mal 3920, Female 80) Tono Irrigation Cooperative Farmers' Union : 500 members (27groups, 14 groups registered)																					
Investigation Results	<p>The project is the second largest gravity irrigation project following to the Kpong Irrigation Project, which commenced construction in 1975, and completed in 1985.</p> <p><b>Irrigation System</b>            Irrigation water is delivered by gravity from the Tono reservoir with a storage capacity of 82.6 MC to the left bank canal (23.3km) and the right bank canal (15.7 km). In addition to the gravity system, the areas B and O of 400ha, which are located on slightly high hills, require pump irrigation system.</p> <p>Along the main canals, Night Storage Reservoirs are provided to reduce sudden changes of canal water level and to provide watering places for cattle. The reservoir has a function of a temporary storage pond of drainage water from outside areas to reduce damages to canals.</p> <p>Two main canals were given concrete lining in 2007, and are in good conditions. The irrigation system, however, has a serious water shortage problem in the field because of remarkable water losses in the irrigation canal network from secondary canal down to field ditch.</p> <p><b>Present Status of Agriculture</b>            Main drainage canal was dug utilizing old river course of the Tono river. The flow capacity of the main drain decreased gradually due to lack of maintenance for many years, and accordingly the poorly functioning drain created poor drainage problem in farmlands.</p> <p style="padding-left: 40px;">Rainy season paddy : 1,500 ha, Dry season paddy : 1,200 ha            As other crops in the rainy season, millet, Groundnut, etc. are cultivated.            Other dry season crops are Soybean, Tomato, Onion, and Pepper.</p>																					
Accessibility	In the project area, the Tumu-Navrongo trunk road traverses.																					

	<p>The project site is located within a distance of 20km from Bolgatanga, capital of the Upper East Region.</p> <p>Accessibility is excellent.</p>
Farmers' Organization	<p>Traditional farmers organization was established based on a community. In line with the government policy, the traditional organization is being reorganized to water users' association.</p> <p>At present, a total of 27 associations with 500 members are reorganized. Fourteen association out of 27 have already registered to the government. The reorganization is going on.</p>
Findings	<ul style="list-style-type: none"> <li>▪ Deterioration of secondary canals are serious. Block lining of the canals are disappeared in many cases.</li> <li>▪ Farmers' organization is well organized, and it seems that they have strong intention to maintain the irrigation system.</li> <li>▪ Farm roads need rehabilitation especially in secondary system.</li> <li>▪ The canal condition of main drain might be the same as Ve a and Kpong irrigation schemes.</li> </ul>
Data Collected	-

### 15. Tono Irrigation Scheme (1/2)



Tono reservoir (Effective storage volume is 82.6 million m<sup>3</sup>)



Spillway canal wall collapse was observed along the length of 20m. Without restoration, other wall sections might be affected. Main reason of this collapse might be pressure of high groundwater level in the rainy season, and weak structure of the wall. At least, weep holes should be installed.

Trace of restoration was observed at opposite side of the wall. This area might be an old river course.



Main canal rehabilitated in 2007 by national budget and CIDA support

Secondary canal:  
Maintenance works such as grass cutting are done before water coming.

**15. Tono Irrigation Scheme (2/2)**



Deteriorated secondary canal. Trace of block lining was seen.



Post harvesting facilities. Silos lost their function due to aging.



Rice-milling machine is working. However, the capacity is insufficient.



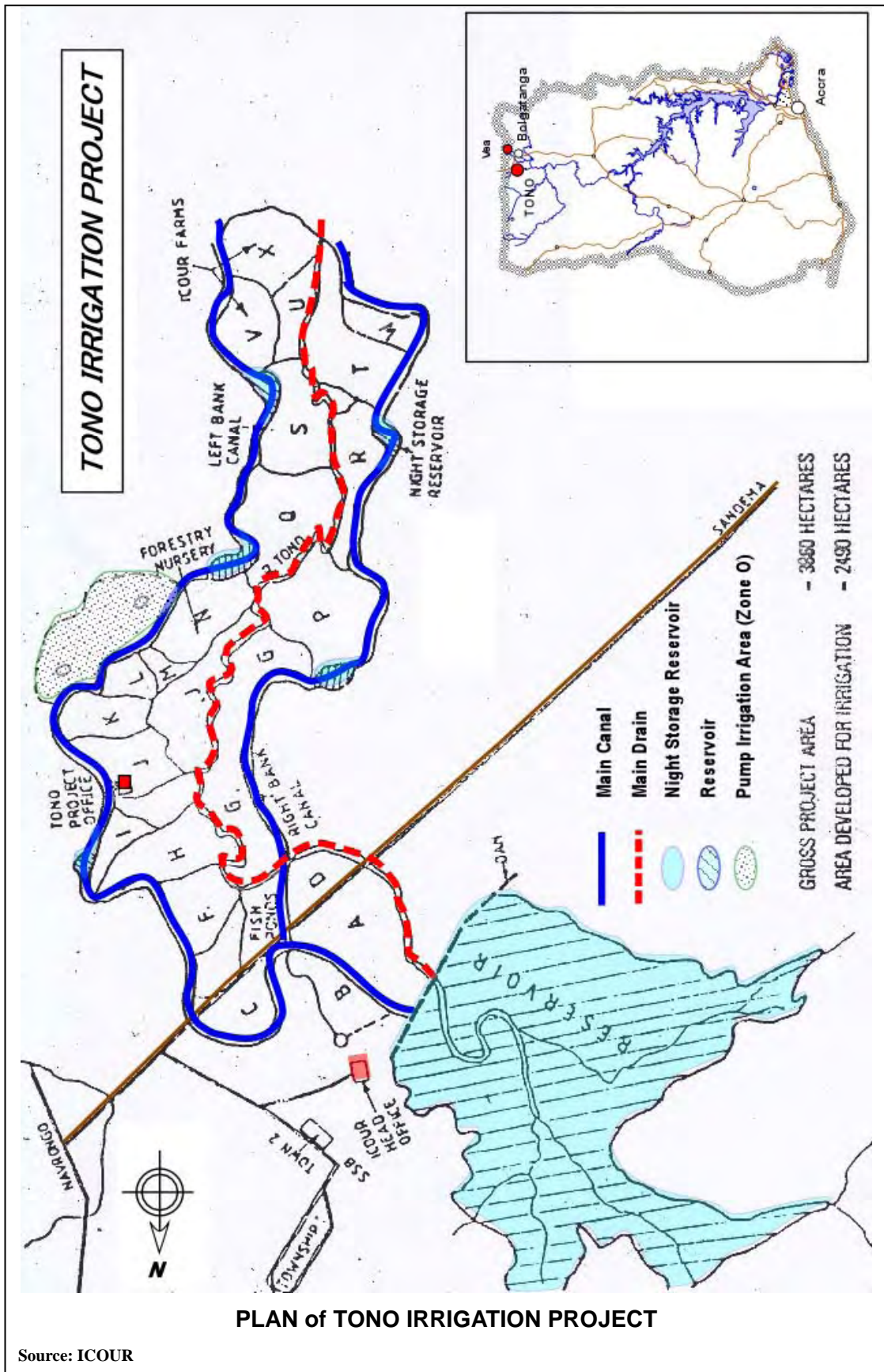
To prevent rice from degradation of quality by rainfall, farmers requested a shed.



Harvesting was conducted mainly by three combine harvesters. Additional combine harvesters are requested by farmers for timely harvesting.



Farmers gathered in the interview survey  
They were willing to participate in project activities.



### Project Investigation Sheet (16)

Project Title	<b>VEA Irrigation Project</b>																							
Project Location	Upper East Region, Bolgatanga District, Vea																							
Date of Investigation	August 2 <sup>nd</sup> , 2010																							
Request by Agency	<ul style="list-style-type: none"> <li>- Raising of levee height</li> <li>- Replacement of intake gate of main canal</li> <li>- Rehabilitation of main canals (Total =26.5 km , Left=14.5 km, Right=12.0 km)</li> <li>- New Construction of Night Storage Reservoirs</li> <li>- Lining of Secondary canals (48 km)</li> <li>- Dredging of main drainage canal (48 km)</li> <li>- Rehabilitation of secondary drainage canals</li> <li>- Rehabilitation of farm roads (21 km)</li> <li>- Provision of farm machinery</li> <li>- Social infrastructure : (public well)</li> </ul>																							
Estimated Project Cost (Estimate by study team)	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Cost Component</th> <th style="text-align: right;">Cost (US\$)</th> </tr> </thead> <tbody> <tr> <td>Rehabilitation of dam :</td> <td style="text-align: right;">8,810,000</td> </tr> <tr> <td>Rehabilitation of main canals :</td> <td style="text-align: right;">3,559,000</td> </tr> <tr> <td>Rehabilitation of secondaries :</td> <td style="text-align: right;">1,137,000</td> </tr> <tr> <td>Dredging of main drain :</td> <td style="text-align: right;">5,331,000</td> </tr> <tr> <td><u>Rehabilitation of farm roads :</u></td> <td style="text-align: right;"><u>1,428,000</u></td> </tr> <tr> <td><u>Total of Direct Cost</u></td> <td style="text-align: right;"><u>20,265,000</u></td> </tr> <tr> <td>Indirect Cost :</td> <td style="text-align: right;">8,925,000</td> </tr> <tr> <td><u>Physical Contingency :</u></td> <td style="text-align: right;"><u>2,027,000</u></td> </tr> <tr> <td>Construction Cost</td> <td style="text-align: right;">31,217,000</td> </tr> </tbody> </table>				Cost Component	Cost (US\$)	Rehabilitation of dam :	8,810,000	Rehabilitation of main canals :	3,559,000	Rehabilitation of secondaries :	1,137,000	Dredging of main drain :	5,331,000	<u>Rehabilitation of farm roads :</u>	<u>1,428,000</u>	<u>Total of Direct Cost</u>	<u>20,265,000</u>	Indirect Cost :	8,925,000	<u>Physical Contingency :</u>	<u>2,027,000</u>	Construction Cost	31,217,000
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<u>Physical Contingency :</u>	<u>2,027,000</u>																							
Construction Cost	31,217,000																							
Project Area	Potential Area	1,197 ha	Developed Area	850 ha																				
	Existing Irrigation Area	468 ha	Requested area	0 ha																				
Number of Beneficiaries	<p>2,000 persons (Male : 1440, Female : 560) ,</p> <p>A total of 72 associations are organized in each secondary canal.</p> <p>At present, 27 associations are registered.</p> <p>Ratio of organized farmers is 100%.</p>																							
Investigation Results	<p>The Veia project is the oldest gravity irrigation project in Ghana, which commenced construction in 1965, and completed in 1980.</p> <p>The project has a problem of sedimentation in the Veia reservoir, which is water source of the project and of drinking water supply to Bolgatanga city. It is said that causes of accelerated sedimentation of the reservoir is created by rapid agricultural development in the upstream river basin area. By today, however, there is no study to verify a cause of the problem.</p>																							
Irrigation System	<p>Irrigation water is delivered by gravity from the Veia reservoir with a storage capacity of 16 MC to left bank and right bank main canals.</p> <p>Main canals are seriously deteriorated. Drainage water, which flowed into the main canals from outside of the project, makes difficult the maintenance activities. Cattle, which comes to take water, destroys canal shapes.</p> <p>Secondary canals also deteriorated remarkably. Water can not reach to tertiary plots.</p> <p>The system lacks water control facilities such as cross regulator and farm</p>																							

	<p>inlet.</p> <p>Main drainage canal was dug utilizing old river course of the Vea river. The flow capacity of the main drain decreased gradually due to lack of maintenance for many years, and accordingly the poorly functioning drain created poor drainage problem in farmlands.</p>
Present Status of Agriculture	<p>Paddy (600ha), and Tomato (800 ha) are major crops.◦</p> <p>As other crops in the rainy season, Millet, Sorghum, Groundnut, etc. are traditionally cultivated.</p> <p>In dry season, cash crops such as Tomato, Onion, etc. are planted.</p>
Accessibility	<p>The project is situated adjacent to Bolgatanga, regional capital city.</p> <p>From Bolgatanga to the project site, a dirt road connects.</p>
Others	<p>The reservoir supplies drinking water with an amount of 0.15 MCM/month to Bolgatanga city. The priority of water supply is given to drinking water.</p> <p>So far, no conflict of water use between irrigation and drinking water supply has been reported.</p>
Findings	<ul style="list-style-type: none"> <li>▪ Conditions of irrigation facilities of the Vea project is worse than those of the Tono. Comprehensive rehabilitation is required.</li> <li>▪ The area is famous for woven basket, and farmers are able to earn non-farming income. For this reason, unfortunately, it seems that farmers lack enthusiasm for participation in irrigation water management and maintenance.</li> <li>▪ Condition of drainage canal is the same as that of the Kpong irrigation project.</li> </ul>
Data/Information Collected	<p>Salient Features of Vea Irrigation Project (A4, 1 Sheet)</p>

<b>16. Veia Irrigation Scheme (1/2)</b>	
	
<p>Rock protection slid down the inside slope. It seems that slope is too steep.</p>	<p>Erosion of outside slope of the Veia dyke:</p>
	
<p>Beginning point of the left main canal needs rehabilitation.</p>	<p>Crossing point between main road and Left main canal Slab bridge is broken.</p>
	
<p>Left main canal: Water flow from outside and cattle destroy canal section.</p>	<p>Left main canal in the middle part (for 1 km) was rehabilitated.</p>

### 16. Vea Irrigation Scheme (2/2)



Main Drainage Canal : Canal flow section is almost closed by grasses and sedimentation.



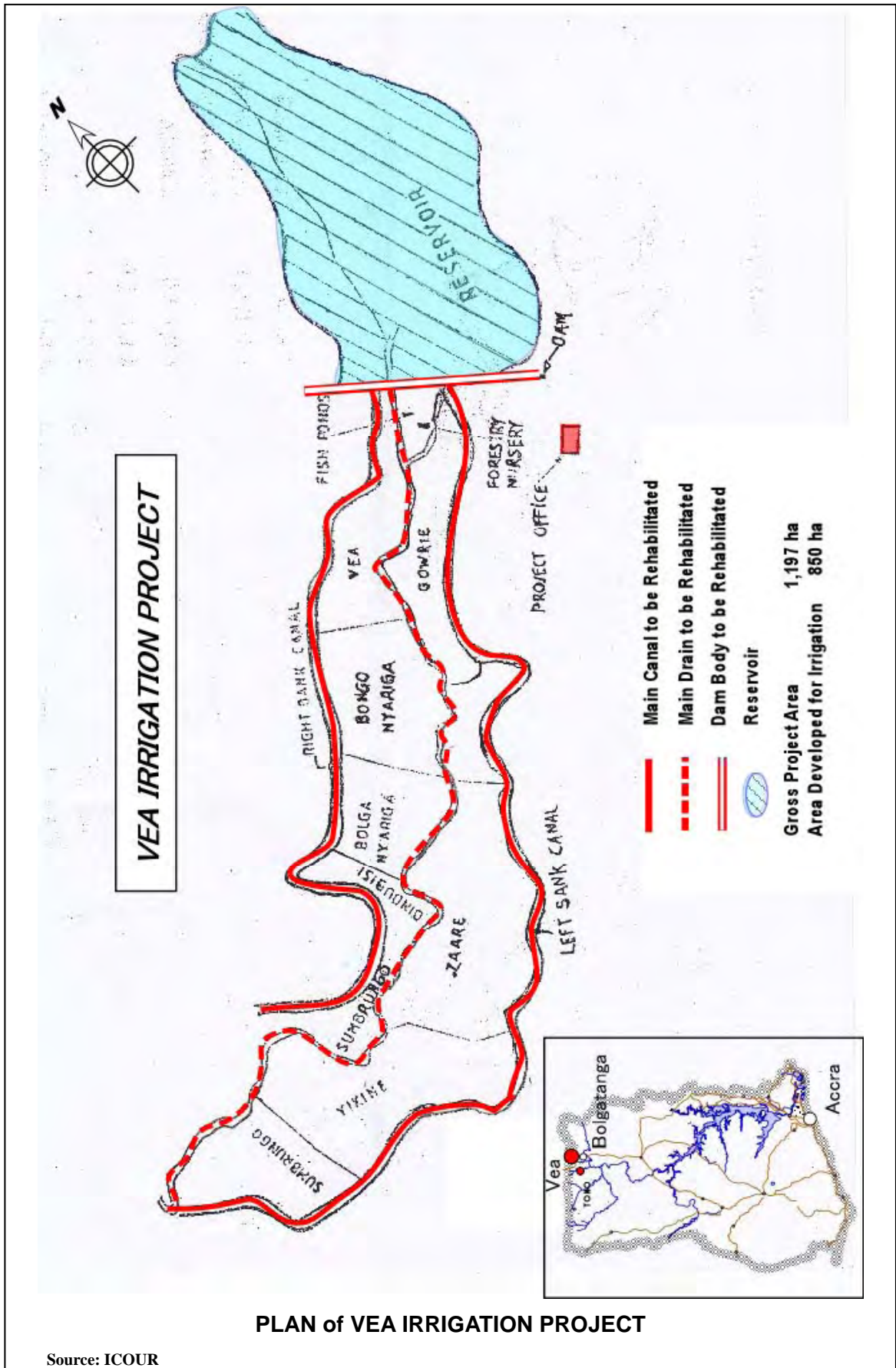
Right Main Canal : Excavated Section  
Deteriorated section by drainage water from outside



Right Main Canal: Excavated Section  
Maintenance of open canal system is difficult.



Right Main Canal in the middle part  
Condition of the canal is fair.



**G-2 List of Irrigation and Drainage Project**

	Project Name	Newly Proposed/ Existing	Location				Irrigation Area (ha)		Construction			Irrigation Water	Beneficiary			Remarks
			Province	District	Town / Village	Coordinates	Major Crops	Area (ha)	Funding Source	Total Cost	Year of Copmle	Water Source	Pop.	Male	Female	
1	Ashaiman	Existing	Greater Accra	Ashiaman	Ashiaman	5° 42'04.15"N: 0° 03' 19.12" E	Rice, Okra	130	Chinese Government & Ghana Government	157	1968	Dzorwulu River/ Ashiuman Reservoir	93	76	17	Existing
2	Dawhenya	Existing	Greater Accra	Dangme	Dawhenya	0° 10' W , 5° 4' N	Rice	200	EU, Ghana Government	NA	1978	Dechidaw River	235	195	40	Existing
3	Kpong	Existing	Greater Accra	Dangme	Akuse/ Asutsuare	NA	Rice/ Vergitables	3000	ADB, BADEA, GOG	NA	1968	Volta River	2500	1750	750	Existing
4	Weija	Existing	Greater Accra	Ga	Kasoa /Tuba	5° 34' N, 0° 21' W	Vegetables/ Asian Vegetables	220	EEC,GOG	NA	1984	Weija Lake / Reservoir	149	124	25	Existing
5	Dordoekope 2	Existing	Greater Accra		Dordoekope 2	NA	Rice, Vegetables	116	BADEA, GOG	1,253,677		Angor River	NA	NA	NA	Under Construction
6	Tokpo	Existing	Greater Accra	Dangbe West	Tokpo	0°20'E , 6°02'N	Rice, Vegetables	90	AfDB	828,322		Volta River	404	236	168	Not Completed
7	Ekotsi	Existing	Central	Mfantsiman West	Ekotsi	0°54'30"W , 5°17'00"N	Vegetables	30	AfDB	757,233	2006	Ochi-Nakwa River	65	43	22	Completed
8	Baafikrom	Existing	Central	Mfantsiman West	Baafikrom	1°02'W , 5°18'N	Vegetables	2	AfDB	328,361	2006	Ochi- Amissa/ Ground Water	10	6	4	Completed
9	Mankessim	Existing	Central	Mfantsiman	Barfikrom/Mankessim	1° 02'-1° 04'W, 5 °18'-5 °20' N	Pepper,Garden, Egg, Water Melon	17	Ghana Governemnt	NA	1984	Apramong River	58	32	16	Completed
10	Okyereko	Existing	Central	Gomoa	Okyereko	5°24'30"N, 0°36'E	Rice, Vegetables	40	AfDB, GOG	1,350	1976	Ayensu River / Okyereko Reservoir	131	88	43	Completed
11	Akurobi	Existing	Brong-Ahafo	Wenchi	Akurobi	2° W , 7° 22' N	Maize, Soya Bean, Vegetable	55	BADEA, GOG	528,566		Yoyo River	100	NA	NA	Under Construction
12	New Longoro	Existing	Brong-Ahafo	Kintampo South	New Longoro	2°01'27"W , 8°07'23"N	Rice, Vegetables	224	AfDB	1,377,965		Chiridi (Sameli) River	360	299	61	Under Construction
13	Subinja	Existing	Brong-Ahafo	Wenchi	Subinja	2° W , 7° 42' to 7° 48'	Maize, Tomatoes, Cowpea	60	AfDB	1,000	1976	Subin River	33	25	8	Under Rehabilitation
14	Tanoso	Existing	Brong-Ahafo	Techiman	Tanoso	10 56' to 2° W , 7° 28' N	Maize, Tomatoes, Cowpea	64	FAO, GIDA, Farmers and GoG	NA	1984	Tano River	209	126	83	Under Rehabilitation

**G-2 List of Irrigation and Drainage Project**

	Project Name	Newly Proposed/ Existing	Location				Irrigation Area (ha)		Construction			Irrigation Water	Beneficiary			Remarks
			Province	District	Town / Village	Coordinates	Major Crops	Area (ha)	Funding Source	Total Cost	Year of Copmle	Water Source	Pop.	Male	Female	
15	Asantekwa	Existing	Brong-Ahafo	Kintampo South	Asantekwa	1° 49'05"W, 8° 05'23"N	Rice, Vegetables	143	AfDB	9,886,000		Yoko River / Black Volta	320	200	120	Under Construction
16	Kaniago	Existing	Brong-Ahafo	Techiman	Kaniago	NA	Maize, Soya Bean, Vegetable	60	AfDB	977,421		Fia River	105	NA	NA	Under Construction
17	Kokroko	Existing	Brong-Ahafo	Techiman	Kokroko	NA	Maize, Soya Bean, Vegetable	66	BADEA, GOG	449,446		Subbin River	110	NA	NA	Not in Good Condition
18	Akumadan	Existing	Ashanti	Offinso	Akumadan	NA	Rice, Vegetables	65	FAO, GoG	NA	1976	Atwetwe River	190	NA	NA	Existing
19	Sata	Existing	Ashanti	Sekyere	Sata	7° 16' N , 1° 23' W	Rice, Vegetables	32	World Bank, GoG	103.24	1994	Sata River	52	NA	NA	Existing
20	Anum Valley	Existing	Ashanti	Ejisu-Juabeng	Nobewam	6°15' N , 1°15' W	Rice	124	GoG, Chinese Government	NA	1991	Anum/Owerri River	150	120	30	Existing
21	Nobeko	Existing	Ashanti	Asunafo South	Nobeko	NA	Maize, Soya Bean, Vegetable	60	BADEA, GOG	628,221		Tano River	110	NA	NA	Under Construction
22	Adiembra	Existing	Ashanti	Ahafo Ano	Adiembra	NA	Maize, Cowpea, Vegetable	38	BADEA, GOG	560,689		Offin River	NA	NA	NA	Under Construction
23	Asuoso	Existing	Ashanti	Offinso	Asuoso	0°24'20"E , 7°30' N	Rice, Vegetables	10	AfDB	482,326	2008	Adamasu Stream / Pru River	54	35	19	Completed
24	Tono	Existing	Upper East	Bolgatanga	Tono	10° 48' N , 1° 12' W	Rice, Soyabeans, Vegetables	2490	Ghana Government	1618	1985	Tono River	4000	3920	80	Rehabilitated
25	Vea	Existing	Upper East	Bolgatanga	Vea	10° 59' 59.12" N , 0° 51' 04.27" W	Tomatoes, Soyabeans	850	Ghana Government	NA	1980	Yaragantanga River	2000	1440	560	Rehabilitated
26	Goog	Existing	Upper East	Bawku West	Goog / Zebilla	02° 25'37"W , 10° 59'43"N	Vegetable	93	AfDB	5,934,158	2007	Sambolekuliga	600	365	235	Completed
27	Tiegu-Yarugu	Existing	Upper East	Bawku West	Tiegu-Yarugu /Zebilla	00° 23'32" W , 10° 59'00"N	Vegetable	200	AfDB	9,953,816		White Volta	411	296	115	Patially completed

## G-2 List of Irrigation and Drainage Project

	Project Name	Newly Proposed/ Existing	Location				Irrigation Area (ha)		Construction			Irrigation Water	Beneficiary			Remarks
			Province	District	Town / Village	Coordinates	Major Crops	Area (ha)	Funding Source	Total Cost	Year of Copmle		Water Source	Pop.	Male	
28	Baare	Existing	Upper East	Talensi Nabdan	Baare	0° 47'00" W , 10° 44'00"N	Vegetables	12	AfDB	418,665	2007	NA	200	165	35	Completed
29	Belebor	Existing	Upper West	Wa	Belebor	02° 31'32"W , 10° 05'41"N	Rice & Vegetable	120	AfDB	3,080,403	2008	Bele River	78	59	19	Completed
30	Jawia	Existing	Upper West	Sissala	Jawia	02° 07'47"W , 10° 55'50"N	Rice & Vegetable	30	AfDB	NA	2008	Sissili River	340	260	80	Completed
31	Sing-Bakpong	Existing	Upper West	Wa	Sing-Bakpong	02° 25'312"W , 09°59'34"N	Rice, Vegetables	52	AfDB	2,488,705	2008	Pasle Stream / Nabibawo Stream	275	180	95	Completed
32	Tizza	Existing	Upper West	Jirap-Lambussie	Tizza	02° 42'48"W , 10° 35'03"N	Rice, Vegetables	76	AfDB	3,914,715	2008	NA	131	83	48	Completed
33	Dipali	Existing	Northern	Savelugu-Nanton	Dipali	0° 56'10"W , 9°46'01"N	Rice, Vegetables	171	AfDB	8,054,538	2009	White Volta	140	90	50	Due for Rehabilitation
34	Dinga	Existing	Northern	Savelugu-Nanton	Dinga	0° 59'36"W, 9° 53'10"N	Rice, Vegetables	90	AfDB	5,446,103	2009	White Volta	111	60	51	Patially completed
35	Buipe	Existing	Northern	West Gonja	Buipe	0° 26'37"W , 8° 46'17"N	Rice, Vegetables	110	AfDB	5,865,053	2009	Black Volta	200	125	75	Patially completed
36	Yapei	Existing	Northern	West Gonja	Yapei	NA	Rice, Vegetables	194	AfDB	5,053,019	2009	White Volta	248	172	76	Patially completed
37	Wambong	Existing	Northern	West Gonja	Wambong	1° 03'W , 9° 20'N	Vegetables	4	AfDB	246,949	2008	White Volta	36	24	12	Patially completed
38	Karamenga	Existing	Northern	West Mampurisi	Karamenga	0° 50'4"W, 10° 34'N	Vegetables	6	AfDB	267,442	2008	White Volta	75	41	34	Patially completed
39	Sogo	Existing	Northern	Savelugu-Nanton	Sogo	0° 59'36"W, 9° 51'30"N	Rice, Vegetables	125	AfDB	6,114,205	2009	White Volta	298	203	95	Patially completed
40	Libga	Existing	Northern	Savelugu	Libga	NA	Rice, Vegetables	20	Ghana Government	NA	1970	Perusua River	51	45	6	Due for Rehabilitation
41	Bontanga	Existing	Northern	Tolon	Botanga	9° 28'N, 1° 03'W	Rice, Vegetables	390	UK, GOG	NA	1983	Botanga Reservoir	497	482	15	Good
42	Golinga	Existing	Northern	Tolon-Kumbungu	Golinga	9°34'15.75"N, 1°01'21.13"W	Rice, Vegetables	20	GOG	NA	1974	Korni River	156	124	32	Due for Rehabilitation
43	Dedeso	Existing	Eastern	Fanteakwa	Dadeso	NA	Pepper, Onoins, Tomatoes	8		NA		Volta Lake	13			Under rehabilitation

**G-2 List of Irrigation and Drainage Project**

	Project Name	Newly Proposed/ Existing	Location				Irrigation Area (ha)		Construction			Irrigation Water	Beneficiary			Remarks
			Province	District	Town / Village	Coordinates	Major Crops	Area (ha)	Funding Source	Total Cost	Year of Copmle .		Water Source	Pop.	Male	
44	Amate	Existing	Eastern	Kwahu	Amate	NA	Pepper, Onions, Tomatoes	101	GOG	NA	1980	Volta Lake	127			Under rehabilitation
45	Gyadem	Existing	Eastern	Birim South	Gyadem	1°03'00"W, 5°55'00"N	Rice & Vegetable	78	AfDB	274,712		Birim River / Pra River	176	112	64	Not yet Constructed
46	Agoverme	Existing	Volta	North Tongu	Agoverme	NA	Maize, Soya Bean, Vegetable	107	AfDB	222,805		Volta	91	53	38	Not Completed
47	Koloe-Dayi	Existing	Volta	Hohoe	Koloenu	0°24'20"E , 7°02'30"N	Rice, Vegetables	30	AfDB	1,012,737	2004	Koloe River & Dayi River	45	25	20	Completed
48	Kolor	Existing	Volta	North Tongu	Kolor	NA	Rice, Vegetables	206	AfDB	654,672		Volta	217	149	68	Not Completed
49	Tordzinu	Existing	Volta	Sorth Tongu	Tordzinu	0°24' E , 5°42' N	Vegetables	4	AfDB	137,619	2004	Tordzi	20	12	8	Completed
50	Afife	Existing	Volta	Ketu	Denu / Afife	0° 55' E , 6° 08'	Rice, Okra	880	Governemnt of Russia (1962), Republic of Chaina(1978), Ghana Government		1983	Agali & Kplikpa Rivers	1024	745	279	Completed
51	Aveyime	Existing	Volta	North Battor	Aveyime	NA	Rice	63	China, Korea and Japan		1975	Volta River	83			<u>Under Rehabilitation</u>
52	Kpando-Torkor	Existing	Volta	Kpando-Torkor	Kpando-Torkor	0° 15'-0° 20 E, 6° 59' N	Okra, Maize	40	AfDB		1976	Volta Lake	148			Completed
53	Dordoekope 1	Existing	Volta	South Tongu	Dordoekope 1	0° 36' E, 5° 53' N	Rice, Vegetables	103	BADEA, GOG	264,844		Angor	452	297	155	Not Completed
54	Moseaso	Existing	Western	Wasa-Amanfi West	Moseaso	NA	Maize, Cowpea, Onion, Vegetable	81	BADEA, GOG	526,292	2008	Tano River				Partially Completed
55	Apoonapon	Existing	Western	Sefwi Wiawso	Apoonapon	NA	Maize, Soya Bean, Vegetable	80	BADEA, GOG	770,722		NA				Under Construction
56	Kikam	Existing	Western	Nzema East	Kikam	NA	Rice	27	World Bank, Republic of Korea, Ghana Government	13000	1993	Franza River	22	NA	NA	Not in Use

### G-3 List of Collected Data and Document in Ghana

No.	Title of Document	Source	File Type	Size	Pages	Remarks
<b>A. National Plan / Strategy</b>						
001	MoFA & FAO, May 2010 ; <i>DRAFT NATIONAL IRRIGATION POLICY, STRATEGIES AND REGULATORY MEASURES, MAIN</i>	GIDA	Word file	A4	37	Approved Irrigation Policy
002	- dito - : ANNEXE 1	GIDA	Word file	A4	4	Annex 1: Policy Matrix
003	- dito - : ANNEXE 2	GIDA	Word file	A4	41	Annex 2 ; Draft Regulations
004	- dito - : ANNEXE 3	GIDA	PDF file	A4	1	Annex 3 ; Irrigation Policy and Development Path
005	MoFA, Aug. 2007 ; <i>FOOD AND AGRICULTURE SECTOR DEVELOPMENT POLICY (FASDEP II)</i>	MoFA	PDF file	A4	77	
006	MoFA, Feb. 2009 ; <i>NATIONAL RICE DEVELOPMENT STRATEGY (NRDS)</i>	CARD	PDF file	A4	26	
<b>B. GIDA Related information</b>						
007	GIDA, ORGANIZATIONAL CHART - GIDA	GIDA	Word file	A4	1	Latest organization chart
008	GIDA, NOMINAL ROLL 2009	GIDA	Excel file	A4	18 files	Nominals
<b>C. Irrigation Project Documents, etc.</b>						
009	GIDA, 2010 ; List of Irrigation and Drainage Project	GIDA	Excel file	A4	4	List of 56 GIDA managing projects
010	GIDA ; <i>THE PROJECT FOR PROMOTION OF FARMERS' PARTICIPATION IN IRRIGATION MANAGEMENT INVENTORY OF IRRIGATION AND DRAINAGE FACILITIES, CHAPTER 4</i>	GIDA	Word file	A4	52	Inventory results of 22 Public Irrigation Projects
011	GIDA, 2008 ; <i>LOCATION MAP OF IRRIGATION PROJECTS</i>	GIDA	PDF file	A3	1	
012	WB , Nov.30, 2007 ; <i>IMPLEMENTATION AND COMPLETION AND RESULT REPORT FOR AN AGRICULTURAL SERVICES SUBSECTOR INVESTMENT PROJECT</i>	The World Bank Library	PDF file	A4	69	
013	African Development Fund, Country Department West Region, Oct 1997 ; <i>APPRAISAL REPORT, SMALL-SCALE IRRIGATION DEVELOPMENT PROJECT</i>	AfDB Library	PDF file	A4	105	Report related to SSIDP
014	Halcrow Rural Management Ltd, Feb 1996 ; <i>SMALL SCALE IRRIGATION PROJECT INCEPTION REPORT (FINAL), GIDA</i>	AfDB Library	PDF file	A4	249	- dito -
015	African Development Fund, OCAR CENTRAL & REGIONS, Mar 2006 ; <i>APPRAISAL REPORT, AFRAM PLAINS AGRICULTURAL DEVELOPMENT PROJECT</i>	AfDB Library	PDF file	A4	66	
016	African Development Fund, OCDW Country Department West Region, Mar 2001 ; <i>APPRAISAL REPORT, INLAND VALLEYS RICE DEVELOPMENT PROJECT</i>	AfDB Library	PDF file	A4	45	
017	African Development Fund, OSAN AGRICULTURE & AGRO-INDUSTRY DEPARTMENT, Oct 2007 ; <i>APPRAISAL REPORT, NORTHERN RURAL GROWTH PROGRAMME</i>	AfDB Library	PDF file	A4	29	On-going Project

### G-3 List of Collected Data and Document in Ghana

No.	Title of Document	Source	File Type	Size	Pages	Remarks
018	Nippon koei & Taiyo Consultants, May 1997 ; <i>THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA, Volume I Main Report</i> , JICA	JICA Library	PDF file	A4	286	
019	- dito - : Volume II, ANNEXES	JICA Library	PDF file	A4	860	
020	- dito - : Volume III, DRAWINGS	JICA Library	PDF file	A4	68	
021	JICA , June, 1988 ; Contact Mission Report on the Asutuare Irrigation Rehabilitation Project, (Japanese Version)	JICA Library	PDF file	A4	103	A report on the KPONG right bank pump irrigation area
022	STUDI, AL OBAID & OMPTRAN, Jun 2010; <i>DETAILED FEASIBILITY STUDY OF ACCRA PLAINS IRRIGATION PROJECT, 200000HA</i>	GIDA	PDF file	A4	432	
023	- dito - , <i>LIST OF APPENDIXS</i>	GIDA	PDF file	A4	115	
024	STUDI, AL OBAID & OMPTRAN, Jun 2010; <i>FEASIBILITY STUDY OF THE ACCRA PLAINS IRRIGATION PROJECT, DETAILED FEASIBILITY STUDY FOR THE 5000 Ha</i>	GIDA	PDF file	A4	300	
025	- dito - , <i>LIST OF APPENDIXS</i>	GIDA	PDF file	A4	508	
026	- dito - , <i>MAPS REPORT</i>	GIDA	PDF file	A4	44	
027	STUDI, AL OBAID & OMPTRAN, Jan 2008; <i>FEASIBILITY STUDY OF THE ACCRA PLAINS IRRIGATION PROJECT, INCEPTION REPORT</i>	GIDA	PDF file	A4	63	
028	STUDI, AL OBAID & OMPTRAN, Sep 2008; <i>FEASIBILITY STUDY OF THE ACCRA PLAINS IRRIGATION PROJECT. ZONING REPORT</i>	GIDA	PDF file	A4	33	
029	STUDI, AL OBAID & OMPTRAN, Mar 2008; <i>FEASIBILITY STUDY OF THE ACCRA PLAINS IRRIGATION PROJECT, QUARTERLY REPORT</i>	GIDA	PDF file	A4	84	
030	STUDI, AL OBAID & OMPTRAN, Mar 2008; <i>FEASIBILITY STUDY OF THE ACCRA PLAINS IRRIGATION PROJECT, DRAWINGS</i>	GIDA	PDF file	-	-	
031	<i>ACCRA PLAINS IRRIGATION PROJECT, EIA REPORT</i>	GIDA	PDF file	A4	108	Cover page is missing
032	Sir M.MacDonald & Partners Limitd, May 1989 ; <i>KPONG IRRIGATION PROJECT, DETAILED STUDY, PROJECT PREPARATION AND DESIGN, PROJECT PREPARATION REPORT - RIGHT BANK IRRIGATION PROJECT</i> GIDA	GIDA	PDF file	A4	106	Detailed design report of the Kpong right bank
033	African Development Fund, OCAN AGRICULTURE & RURAL DEVELOPMENT DEPARTMENT, Feb 2005 ; <i>PROJECT COMPLETION REPORT, KPONG IRRIGATION PROJECT</i>	AfDB Library	PDF file	A4	57	
034	Mott, MacDonald, May 2000 ; <i>KPONG IRRIGATION PROJECT, IRRIGATION MANAGEMENT AND OPERAION AND MAINTENANCE REPORT</i>	GIDA	PDF file	A4	158	Operation and Maintenance report on the Kpong right bank area

### G-3 List of Collected Data and Document in Ghana

No.	Title of Document	Source	File Type	Size	Pages	Remarks
035	SNC/LAVALIN International, Apr 2010 ; FEASIBILITY STUDY, FINAL DESIGN & CONSTRUCTION SUPERVISION OF REHABILITATION/EXTENSION WORKS ON IRRIGATION SCHEMES IN MCA INTERVENTION ZONES-LOT 3 KPONG LEFT BANK IRRIGATION, MAIN DOCUMENT, MiDA	GIDA	PDF file	A4	81	F/S report of the Kpong left bank project
036	SNC/LAVALIN International, Apr 2010 ; FEASIBILITY STUDY, FINAL DESIGN & CONSTRUCTION SUPERVISION OF REHABILITATION/EXTENSION WORKS ON IRRIGATION SCHEMES IN MCA INTERVENTION ZONES-LOT 3 KPONG LEFT BANK IRRIGATION, ANNEX 3, FINANCIAL AND ECONOMIC APPRAISAL, MiDA	GIDA	PDF file	A4	37	ANNEX 3
037	SNC/LAVALIN International, Apr 2010 ; FEASIBILITY STUDY, FINAL DESIGN & CONSTRUCTION SUPERVISION OF REHABILITATION/EXTENSION WORKS ON IRRIGATION SCHEMES IN MCA INTERVENTION ZONES-LOT 3 KPONG LEFT BANK IRRIGATION, ANNEX 4, AGRONOMY, MiDA	GIDA	PDF file	A4	79	ANNEX 5
038	SNC/LAVALIN International, Apr 2010 ; FEASIBILITY STUDY, FINAL DESIGN & CONSTRUCTION SUPERVISION OF REHABILITATION/EXTENSION WORKS ON IRRIGATION SCHEMES IN MCA INTERVENTION ZONES-LOT 3 KPONG LEFT BANK IRRIGATION, ANNEX 5, SOIL AND SUITABILITIES FOR CROP PRODUCTION, MiDA	GIDA	PDF file	A4	79	ANNEX 5
039	SNC/LAVALIN International, Apr 2010 ; FEASIBILITY STUDY, FINAL DESIGN & CONSTRUCTION SUPERVISION OF REHABILITATION/EXTENSION WORKS ON IRRIGATION SCHEMES IN MCA INTERVENTION ZONES-LOT 3 KPONG LEFT BANK IRRIGATION, ANNEX 7, ORGANISATIONAL AND MANAGEMENT NEEDS ASSESSMENT, MiDA	GIDA	PDF file	A4	44	ANNEX 7
040	UNDP & FAO, 1967 ; <i>LAND AND WATER SURVEY IN THE UPPER AND NORTHERN REGIONS GHANA, FINAL REPORT Volume V, WATER RESOURCES DEVELOPMENT AND SOIL CONSERVATION</i>	GIDA	PDF file	A4	118	
041	TAHAL CONSULTING ENGINEERS LTD., Dec. 1988 ; <i>KAMBA RIVER IRRIGATION PROJECT PHASE 2, FEASIBILITY STUDY</i> , GIDA	GIDA	PDF file	A4	336	F/S Reort of newly requested Kamba Project
042	GIDA ; SMALL FARMS IRRIGAION PROJECT	GIDA	Word file	A4	4	List of Small Farms Irrigation Project
043	GIDA ; COMMUNITY MANAGEMENT IRRIGAION PROJECT	GIDA	Excel file	A4	290	List of Community Management Project