TABLES

Table A-1 Result of Farm Interview Survey (1/13)

Projects/No. of Samples / Question Items	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
Q-1 General Information													
1.3 Educational Level of Householder													
(1) Primary School	20%	13%	30%	13%	27%	-	10%	40%	-	15%	20%	25%	16%
(2) Junior Secondary	50%	53%	50%	46%	33%	87%	65%	20%	90%	10%	30%	50%	48%
(3) Senior Secondary	15%	13%	10%	21%	-	7%	5%	-	-	10%	10%	25%	10%
(4) Higher School	5%	7%	-	8%	-	7%	-	-	-	-	-	-	3%
(5) University	-	-	-	-	-	-	-	-	-	-	20%	-	1%
(6) Non	10%	13%	10%	13%	40%	-	20%	40%	10%	65%	20%	-	21%
1.4 Agricultural Experience of Householder (Years)	19	13	17	17	17	14	15	20	12	22	18	17	17
Q-2 Size of Household													
Total (Persons)	7.05	6.80	7.90	8.44	7.47	6.47	6.45	7.80	6.10	7.85	5.90	6.60	7.2
Population by Age Group													
Male	51.1%	49.0%	49.4%	51.7%	50.9%	46.4%	52.7%	48.7%	47.5%	50.3%	50.8%	42.4%	49.8%
60 <	2.8%	-	1.3%	1.4%	4.5%	1.0%	1.6%	1.3%	1.6%	1.9%	1.7%	-	1.7%
45 - 59	10.6%	3.9%	5.1%	2.8%	2.7%	4.1%	4.7%	2.6%	3.3%	4.5%	5.1%	1.5%	4.4%
30 - 44	2.8%	10.8%	2.5%	9.0%	7.1%	10.3%	4.7%	5.1%	11.5%	10.2%	10.2%	12.1%	7.8%
15 - 29	19.9%	9.8%	15.2%	16.6%	17.0%	13.4%	14.0%	23.1%	14.8%	16.6%	15.3%	9.1%	15.7%
0 - 14	14.9%	24.5%	25.3%	21.8%	19.6%	17.5%	27.9%	16.7%	16.4%	17.2%	18.6%	19.7%	20.2%
Female	48.9%	51.0%	50.6%	48.3%	49.1%	53.6%	47.3%	51.3%	52.5%	49.7%	49.2%	57.6%	50.2%
60 <	-	1.0%	1.3%	0.9%	0.9%	3.1%	2.3%	2.6%	-	5.7%	1.7%	6.1%	2.1%
45 - 59	5.7%	2.0%	6.3%	2.4%	5.4%	4.1%	3.9%	6.4%	6.6%	3.8%	3.4%	3.0%	4.2%
30 - 44	9.9%	6.9%	6.3%	12.3%	11.6%	6.2%	9.3%	9.0%	11.5%	10.8%	13.6%	6.1%	9.8%
15 - 29	21.3%	17.6%	7.6%	13.3%	7.1%	18.6%	13.2%	19.2%	16.4%	9.6%	18.6%	19.7%	14.6%
0 - 14	12.1%	23.5%	29.1%	19.4%	24.1%	21.6%	18.6%	14.1%	18.0%	19.7%	11.9%	22.7%	19.5%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
60<	2.8%	1.0%	2.5%	2.4%	5.4%	4.1%	3.9%	3.8%	1.6%	7.6%	3.4%	6.1%	3.8%
45 - 59	16.3%	5.9%	11.4%	5.2%	8.0%	8.2%	8.5%	9.0%	9.8%	8.3%	8.5%	4.5%	8.6%
30 - 44	12.8%	17.6%	8.9%	21.3%	18.8%	16.5%	14.0%	14.1%	23.0%	21.0%	23.7%	18.2%	17.6%
15 - 29	41.1%	27.5%	22.8%	29.9%	24.1%	32.0%	27.1%	42.3%	31.1%	26.1%	33.9%	28.8%	30.3%
0 - 14	27.0%	48.0%	54.4%	41.2%	43.8%	39.2%	46.5%	30.8%	34.4%	36.9%	30.5%	42.4%	39.7%
Q-3 Land Holding and Land Tenure													
(1) Total holding area (ha)	2.65	3.24	2.31	4.63	2.66	2.15	1.35	6.43	5.80	3.97	4.80	1.66	3.34
Farm Land	1.37	3.09	2.16	3.85	2.21	1.34	0.95	5.44	4.36	3.43	3.49	1.42	2.66
Paddy Field	(0.74)	(0.48)	-	(2.36)	(0.82)	-	-	-	-	(1.71)	-	(0.42)	(0.73)
Upland Field	(0.63)	(2.61)	(2.16)	(1.49)	(1.39)	(1.34)	(0.95)	(5.44)	(4.36)	(1.72)	(3.49)	(1.00)	(1.93)
Grass Land	-	-	0.04	0.31	0.27	0.03	0.38	0.64	1.40	0.12	1.24	-	0.30
Homestead	0.02	0.04	0.11	0.15	0.10	0.03	0.02	0.35	0.04	0.34	0.07	0.04	0.10
Others	1.26	0.11	-	0.32	0.08	0.75	-	-	-	0.08	-	0.20	0.28
(2) Land Tenure													
(a) Paddy-Irrigated (ha)													
Total Holding Area	0.74	0.43	-	2.12	0.14	-	-	-	-	1.13	-	0.42	0.57
Own Land	-	-	-	-	0.11	-	-	-	-	-	-	0.02	0.01
Leased to Others	-	-	-	0.02	-	-	-	-	-	-	-	-	-
Borrowed from:													
Government	0.74	0.43	-	2.14	-	-	-	-	-	1.13	-	0.40	0.56
Village Community	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Farmers	-	-	-	-	0.03	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-	-	-	-	-	-
(b) Paddy-Non irrigated (ha)													
Total Holding Area	-	0.05	-	0.24	0.68	-	-	-	-	0.58	-	-	0.16
Own Land	-	0.05	-	0.14	0.03	-	-	-	-	0.58	-	-	0.09
Leased to Others	-	-	-	0.02	-	-	-	-	-	-	-	-	-
Borrowed from:													
Government	-	-	-	0.02	0.65	-	-	-	-	-	-	-	0.06
Village Community	-	-	-	0.10	-	-	-	-	-	-	-	-	0.01
Other Farmers	-	-	-	-	-	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-	-	-	-	-	-
(c) Upland-Irrigated (ha)													
Total Holding Area	0.19	0.89	0.43	-	-	0.10	0.21	0.40	0.44	0.40	0.93	0.04	0.29
Own Land	-	-	-	-	-	-	-	-	-	-	-	-	-
Leased to Others	-	-	-	-	-	-	-	-	-	-	-	-	-
Borrowed from:													
Government	0.19	0.89	0.43	-	-	0.10	0.21	0.40	0.44	0.40	0.93	-	0.29
Village Community	-	-	-	-	-	-	-	-	-	-	-	0.04	-
Other Farmers	-	-	-	-	-	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-	-	-	-	-	-
(d) Upland-Non irrigated (ha)													
Total Holding Area	0.44	1.72	1.73	1.49	1.39	1.24	0.74	5.04	3.92	1.32	2.56	0.96	1.64
Own Land	0.10	0.35	1.63	0.53	0.69	0.83	0.23	5.04	2.68	1.02	0.68	-	0.94
Leased to Others	-	-	0.10	-	0.03	-	-	-	-	-	-	-	0.01
Borrowed from:													
Government	0.32	0.08	-	-	0.13	-	-	-	-	0.12	0.02	-	0.07
Village Community	-	1.01	-	0.50	0.35	0.38	0.20	-	1.24	-	1.86	0.96	0.46
Other Farmers	0.02	0.28	0.20	0.44	0.08	0.03	0.27	-	-	0.18	-	-	0.16
Others	-	-	-	0.02	0.17	-	0.04	-	-	-	-	-	0.02

Table A-1 Result of Farm Interview Survey (2/13)

Projects/No. of Samples / Question Items	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
(e) Grass Land (ha)													
Total Holding Area	-	-	0.04	0.31	0.27	0.03	0.38	0.64	1.40	0.12	1.24	-	0.30
Own Land	-	-	0.04	0.05	0.27	-	0.17	0.64	1.04	0.12	0.84	-	0.20
Leased to Others	-	-	-	0.06	-	-	-	-	-	-	-	-	0.01
Borrowed from:													
Government	-	-	-	0.13	-	-	-	-	-	-	-	-	0.02
Village Community	-	-	-	0.16	-	0.03	0.11	-	0.28	-	0.28	-	0.07
Other Farmers	-	-	-	0.03	-	-	0.10	-	-	-	0.12	-	0.02
Others	-	-	-	-	-	-	-	-	0.08	-	-	-	-
(f) Homestead (ha)													
Total Holding Area	0.02	0.04	0.11	0.15	0.10	0.03	0.02	0.35	0.04	0.34	0.07	0.04	0.10
Own Land	0.01	0.01	0.11	0.11	0.06	0.02	0.02	0.29	0.04	0.34	0.02	0.02	0.09
Leased to Others	-	-	-	-	-	-	-	-	-	-	-	-	-
Borrowed from:													
Government	0.01	0.03	-	-	-	-	-	-	-	-	-	-	-
Village Community	-	-	-	0.02	0.03	0.01	-	0.06	-	-	-	0.02	0.01
Other Farmers	-	-	-	-	0.01	-	-	-	-	-	0.04	-	-
Others	-	-	-	0.02	-	-	-	-	-	-	0.01	-	-
(g) Others (ha)													
Total Holding Area	1.26	0.11	-	0.32	0.08	0.75	-	-	-	0.08	-	0.20	0.28
Own Land	1.26	0.11	-	-	0.08	0.75	-	-	-	-	-	-	0.22
Leased to Others	-	-	-	0.03	-	-	-	-	-	-	-	-	-
Borrowed from:													
Government	-	-	-	0.03	-	-	-	-	-	-	-	-	-
Village Community	-	-	-	0.32	-	-	-	-	-	-	-	-	0.04
Other Farmers	-	-	-	-	-	-	-	-	-	0.08	-	0.20	0.02
Others	-	-	-	-	-	-	-	-	-	-	-	-	-
Q-4 Livestock Raising (head/farmer)													
(1) Buffalos	-	-	-	-	-	-	-	-	-	-	-	-	-
(2) Cattle	-	-	-	0.1	2.3	-	-	-	-	2.7	0.8	-	0.6
(3) Horses	-	-	-	-	-	-	-	-	-	1.3	-	-	0.1
(4) Goats	0.7	1.6	1.8	3.6	2.9	2.1	2.1	0.6	0.9	4.7	2.6	2.9	2.4
(5) Sheep	0.9	1.5	-	2.0	0.7	0.6	1.9	0.6	1.3	4.5	0.5	2.0	1.6
(6) Hogs (Pig)	-	-	-	-	-	1.5	-	1.0	-	-	1.9	-	0.3
(7) Chickens	4.7	7.7	11.0	17.6	14.0	6.3	9.2	9.6	8.8	24.1	21.3	17.3	12.8
(8) Ducks	-	1.5	3.1	2.2	4.5	0.7	-	-	1.0	2.0	2.0	0.7	1.5
(9) Rabbits	-	-	-	-	-	0.9	0.2	-	-	-	-	-	0.1
(10) Others	-	-	1.1	2.0	1.4	0.1	-	0.4	-	2.0	1.6	0.4	0.8
Q-5 Inventory of Farm Machinery and Equipment (No./farmer)													
(1) 4-Wheel tractor	0.05	-	-	0.04	-	-	-	-	-	0.05	-	-	0.02
(2) 2-Wheel tractor	-	-	-	0.24	-	-	-	-	-	-	-	-	0.03
(3) Plough for tractor	0.05	-	-	-	-	-	-	-	-	0.05	-	-	0.01
(4) Harrow for tractor	0.05	-	-	-	-	-	-	-	-	0.05	-	-	0.01
(5) Rotavator/tiller for tractor	-	-	-	0.16	-	-	-	-	-	0.05	-	-	0.03
(6) Cultivator for tractor	-	-	-	-	-	-	-	-	-	-	-	-	-
(7) Tractor trailer	0.05	-	-	0.12	-	-	-	-	-	0.05	-	-	0.03
(8) Truck/Pick-up	-	-	-	-	-	-	-	-	-	-	-	-	-
(9) Water pump	-	0.07	-	-	0.07	-	0.05	-	-	-	-	-	0.02
(10) Plough for animal	-	-	0.30	-	-	-	-	-	-	-	-	-	0.02
(11) Harrow for animal	-	-	-	-	-	-	-	-	-	-	-	-	-
(12) Animal cart	-	-	-	-	-	-	-	-	-	-	-	-	-
(13) Drill Seeder	-	-	-	-	-	-	-	-	-	-	-	-	-
(14) Rotary weeder	-	-	-	-	-	-	-	-	-	-	-	-	-
(15) Knapsack type sprayer	0.35	0.47	-	0.44	0.13	0.40	0.30	-	0.10	0.30	0.50	0.20	0.29
(16) Power Sprayer	0.20	0.33	0.20	0.04	-	0.07	-	0.60	0.10	0.15	0.40	-	0.15
(17) Thresher with engine	-	-	-	0.36	-	-	-	-	-	-	-	-	0.05
(18) Rice mill	-	-	-	0.04	-	-	-	-	-	0.05	-	-	0.01
Q-6 Social Infrastructure and Home Facilities													
(1) Supply of electricity													
Yes (%)	80%	64%	-	20%	-	57%	53%	100%	100%	10%	89%	-	44%
No (%)	20%	36%	100%	80%	100%	43%	47%	-	-	90%	11%	100%	56%
(2) Domestic water supply													
Yes (%)	100%	80%	-	24%	13%	23%	100%	-	-	78%	22%	-	47%
No (%)	-	20%	100%	76%	87%	77%	-	100%	100%	22%	78%	100%	53%
If "No", what is water resources ?													
a) River (%)	-	-	100%	26%	100%	82%	-	100%	100%	17%	25%	100%	71%
b) Well (%)	-	-	-	16%	-	18%	-	-	-	-	50%	-	7%
c) Canal (%)	-	100%	-	32%	-	-	-	-	-	-	-	-	10%
d) Pond (%)	-	-	-	26%	-	-	-	-	-	83%	-	-	11%
e) Others (%)	-	-	-	-	-	-	-	-	-	-	25%	-	1%
(3) Oil Cooker (%)	25%	33%	-	12%	33%	13%	5%	-	-	5%	-	-	12%
(4) Electric cooker (%)	-	7%	-	4%	-	7%	5%	10%	-	10%	-	-	4%
(5) Refrigerator (%)	25%	7%	-	8%	-	-	-	-	-	-	10%	-	5%
(6) Electric Fan (%)	40%	47%	-	20%	-	47%	15%	40%	10%	15%	20%	-	22%
(7) Bicycle (%)	15%	73%	30%	96%	73%	40%	10%	30%	50%	95%	60%	-	52%
(8) Motorcycle (%)	5%	-	-	8%	-	7%	-	20%	-	5%	10%	-	4%
(9) Television (%)	40%	40%	10%	24%	27%	60%	15%	50%	10%	10%	20%	20%	27%
(10) Radio (%)	60%	60%	50%	84%	73%	73%	25%	60%	30%	70%	70%	80%	62%
(11) Radio Cassette (%)	40%	73%	50%	68%	27%	93%	30%	60%	30%	60%	70%	70%	56%
(12) Sewing Machine (%)	55%	27%	80%	40%	40%	53%	50%	40%	30%	30%	60%	40%	44%

Table A-1 Result of Farm Interview Survey (3/13)

Projects/No. of Samples / Question Items	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
Q-7 Marketing and Crop Damage													
Marketing of Products													
(1) Cassava													
a) Middlemen				63%	13%	64%	-		94%		70%	67%	61%
b) Other farmer				-	-	-	-		-		21%	-	5%
c) Sold at market				4%	7%	12%	-		-		-	-	2%
d) For loan repayment				-	-	-	-		-		-	-	-
e) Home consumption				34%	80%	24%	100%		6%		9%	33%	32%
(2) Sweet Potato													
a) Middlemen		90%					23%						46%
b) Other farmer		-					-						-
c) Sold at market		-					72%						47%
d) For loan repayment		-					-						-
e) Home consumption		10%					5%						6%
(3) Yam													
a) Middlemen						17%		64%					49%
b) Other farmer						-		-					-
c) Sold at market						-		18%					12%
d) For loan repayment						-		-					-
e) Home consumption						83%		18%					38%
(4) Maize													
a) Middlemen	36%		89%	16%	-	47%	21%	93%	94%	46%	35%	52%	54%
b) Other farmer	-		-	-	-	-	-	-	-	-	9%	-	1%
c) Sold at market	-		-	-	31%	15%	50%	-	-	2%	11%	20%	8%
d) For loan repayment	-		-	-	-	-	-	-	-	-	1%	-	0%
e) Home consumption	64%		11%	84%	69%	38%	29%	7%	6%	52%	44%	28%	38%
(5) Rice													
a) Middlemen	85%	92%		49%						81%		57%	61%
b) Other farmer	1%	-		2%						2%		-	2%
c) Sold at market	4%	-		9%						6%		21%	8%
d) For loan repayment	1%	-		24%						0%		2%	15%
e) Home consumption	9%	8%		16%						10%		20%	14%
(6) Egg Plant (Garden Egg)													
a) Middlemen		91%					70%				88%		86%
b) Other farmer		-					-				-		-
c) Sold at market		7%					26%				-		7%
d) For loan repayment		-					-				-		-
e) Home consumption		2%					4%				12%		7%
(7) Okra													
a) Middlemen	78%	97%		96%		95%	8%			93%			89%
b) Other farmer	-	-		-		-	-			-			-
c) Sold at market	19%	-		-		-	65%			-			5%
d) For loan repayment	-	-		-		-	-			-			-
e) Home consumption	3%	3%		4%		5%	27%			7%			6%
(8) Onions													
a) Middlemen			95%							20%			95%
b) Other farmer			-							-			-
c) Sold at market			-							78%			0%
d) For loan repayment			-							-			-
e) Home consumption			5%							2%			5%
(9) Hot Pepper													
a) Middlemen		95%	77%			-	29%				98%		77%
b) Other farmer		-	-			-	-				-		-
c) Sold at market		-	18%		75%		69%				-		19%
d) For loan repayment		-	-		-		-				-		-
e) Home consumption		5%	5%		25%		2%				2%		4%
(10) Tomatoes													
a) Middlemen		31%	97%				9%	99%	98%	93%	82%	84%	81%
b) Other farmer		-	-				-	-	-	-	-	-	-
c) Sold at market		57%	-				87%	-	-	-	-	-	14%
d) For loan repayment		9%	-				-	-	-	-	-	-	2%
e) Home consumption		3%	3%				4%	1%	2%	7%	18%	16%	3%
(11) Cowpea													
a) Middlemen		80%								38%	93%		77%
b) Other farmer		-								-	-		-
c) Sold at market		-								40%	-		10%
d) For loan repayment		-								-	-		-
e) Home consumption		20%								22%	7%		12%
(12) Groundnuts													
a) Middlemen			61%	-						67%		49%	48%
b) Other farmer			-	-						-		-	-
c) Sold at market			33%	83%						6%		38%	39%
d) For loan repayment			-	-						-		-	-
e) Home consumption			6%	17%						27%		14%	14%

Table A-1 Result of Farm Interview Survey (4/13)

Question Items \ Projects/No. of Samples	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
Marketing of Seeds													
(1) Cassava													
a) Government agency				-	-	-	-		13%		-	-	3%
b) From extension worker				-	-	-	-		-		-	-	-
c) Purchased at market				-	18%	25%	-		-		-	-	8%
d) From other farmers				17%	64%	75%	-		-		67%	33%	39%
e) Purchased from dealer				-	-	-	-		-		33%	-	3%
f) Own seed (from the last harvest)				67%	18%	-	100%		88%		-	67%	44%
g) Others				17%	-	-	-		-		-	-	3%
(2) Sweet Potato													
a) Government agency		-					-						-
b) From extension worker		-					-						-
c) Purchased at market		-					-						-
d) From other farmers		-					33%						25%
e) Purchased from dealer		-					-						-
f) Own seed (from the last harvest)		100%					67%						75%
g) Others		-					-						-
(3) Yam													
a) Government agency						-		-					-
b) From extension worker						-		-					-
c) Purchased at market						50%		-					40%
d) From other farmers						25%		100%					40%
e) Purchased from dealer						25%		-					20%
f) Own seed (from the last harvest)						-		-					-
g) Others						-		-					-
(4) Maize													
a) Government agency	-		50%	19%	14%	43%	-	38%	70%	23%	-	20%	26%
b) From extension worker	-		17%	5%	-	21%	-	13%	-	-	14%	-	6%
c) Purchased at market	50%		-	33%	43%	29%	33%	13%	-	8%	-	-	20%
d) From other farmers	-		33%	14%	14%	-	22%	13%	-	15%	14%	60%	17%
e) Purchased from dealer	50%		-	5%	7%	-	33%	25%	10%	8%	57%	10%	13%
f) Own seed (from the last harvest)	-		-	24%	21%	7%	11%	-	20%	46%	14%	10%	18%
g) Others	-		-	-	-	-	-	-	-	-	-	-	-
(5) Rice													
a) Government agency	-	-		-						6%		80%	13%
b) From extension worker	6%	-		-						-		-	1%
c) Purchased at market	18%	-		-						6%		-	6%
d) From other farmers	24%	33%		25%						44%		10%	28%
e) Purchased from dealer	6%	-		-						-		-	1%
f) Own seed (from the last harvest)	47%	67%		71%						44%		10%	50%
g) Others	-	-		4%						-		-	1%
(6) Egg Plant (Garden Egg)													
a) Government agency		-					-				-		-
b) From extension worker		-					-				-		-
c) Purchased at market		13%					15%				17%		15%
d) From other farmers		38%					31%				17%		30%
e) Purchased from dealer		-					-				50%		11%
f) Own seed (from the last harvest)		50%					54%				17%		44%
g) Others		-					-				-		-
(7) Okra													
a) Government agency	-	-		-		-	-			20%			2%
b) From extension worker	-	-		-		-	-			-			-
c) Purchased at market	54%	-		7%		79%	43%			-			35%
d) From other farmers	46%	100%		71%		14%	14%			20%			48%
e) Purchased from dealer	-	-		-		7%	-			20%			3%
f) Own seed (from the last harvest)	-	-		21%		-	43%			40%			13%
g) Others	-	-		-		-	-			-			-
(8) Onions													
a) Government agency			-							-			-
b) From extension worker			-							-			-
c) Purchased at market			-							-			-
d) From other farmers			100%							100%			100%
e) Purchased from dealer			-							-			-
f) Own seed (from the last harvest)			-							-			-
g) Others			-							-			-
(9) Hot Pepper													
a) Government agency		-	-		-		-				-		-
b) From extension worker		-	-		-		-				-		-
c) Purchased at market		-	20%		100%		33%				25%		27%
d) From other farmers		50%	-		-		-				75%		27%
e) Purchased from dealer		50%	-		-		-				-		7%
f) Own seed (from the last harvest)		-	80%		-		67%				-		40%
g) Others		-	-		-		-				-		-

Table A-1 Result of Farm Interview Survey (5/13)

Projects/No. of Samples / Question Items	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
(10) Tomatoes													
a) Government agency		-	-				-	11%	89%	80%	-	-	30%
b) From extension worker		-	-				-	-	-	20%	-	-	2%
c) Purchased at market		-	75%				33%	-	-	-	-	100%	14%
d) From other farmers		56%	25%				-	11%	-	-	100%	-	21%
e) Purchased from dealer		-	-				-	67%	-	-	-	-	14%
f) Own seed (from the last harvest)		44%	-				67%	11%	11%	-	-	-	19%
g) Others		-	-				-	-	-	-	-	-	-
(11) Cowpea													
a) Government agency		-								-	-		-
b) From extension worker		-								-	-		-
c) Purchased at market		-								-	-		-
d) From other farmers		-								50%	-		25%
e) Purchased from dealer		100%								50%	100%		75%
f) Own seed (from the last harvest)		-								-	-		-
g) Others		-								-	-		-
(12) Groundnuts													
a) Government agency			-	-						17%		-	6%
b) From extension worker			-	-						-		-	-
c) Purchased at market			50%	100%						17%		100%	59%
d) From other farmers			25%	-						33%		-	18%
e) Purchased from dealer			-	-						-		-	-
f) Own seed (from the last harvest)			25%	-						33%		-	18%
g) Others			-	-						-		-	-
Crop Damage (Plural Answer)													
(1) Cassava													
a) Drought		-		80%	18%	-	-		25%		-	67%	28%
b) Flood		-		-	-	-	-		-		-	-	-
c) Poor drain		-		-	-	25%	-		-		-	-	3%
d) Pests		-		-	-	-	-		13%		-	-	3%
e) Diseases		-		-	-	-	-		-		-	-	-
f) Bird		-		20%	-	-	-		-		25%	-	6%
g) Rat		-		60%	9%	25%	-		75%		75%	33%	42%
h) Wild animal		-		-	-	-	-		-		-	-	-
(2) Sweet Potato													
a) Drought		-					-						-
b) Flood		-					-						-
c) Poor drain		-					-						-
d) Pests		-					67%						50%
e) Diseases		-					-						-
f) Bird		-					-						-
g) Rat		100%					-						25%
h) Wild animal		-					-						-
(3) Yam													
a) Drought						25%		-					20%
b) Flood						-		-					-
c) Poor drain						-		-					-
d) Pests						50%		100%					60%
e) Diseases						-		-					-
f) Bird						-		-					-
g) Rat						50%		100%					60%
h) Wild animal						-		-					-
(4) Maize													
a) Drought	100%		50%	57%	57%	7%	11%	-	60%	13%	-	50%	34%
b) Flood	-		-	-	21%	7%	-	-	-	-	-	-	3%
c) Poor drain	-		-	5%	-	-	-	-	-	-	11%	10%	3%
d) Pests	-		67%	29%	29%	43%	11%	50%	10%	53%	-	-	29%
e) Diseases	-		-	10%	14%	7%	-	13%	10%	20%	11%	-	9%
f) Bird	-		50%	29%	7%	57%	22%	13%	50%	7%	44%	50%	31%
g) Rat	-		-	52%	-	7%	22%	25%	60%	-	11%	10%	20%
h) Wild animal	-		-	-	-	-	-	-	-	7%	-	-	1%
(5) Rice													
a) Drought	35%	-		24%						-		50%	23%
b) Flood	-	33%		-						-		-	1%
c) Poor drain	-	33%		36%						-		30%	18%
d) Pests	71%	67%		72%						79%		-	64%
e) Diseases	-	67%		40%						47%		50%	35%
f) Bird	47%	67%		64%						74%		90%	66%
g) Rat	71%	100%		52%						32%		20%	49%
h) Wild animal	-	-		-						-		-	-

Table A-1 Result of Farm Interview Survey (6/13)

Projects/No. of Samples / Question Items	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
(6) Egg Plant (Garden Egg)													
a) Drought		-					-				83%		19%
b) Flood		25%					-				-		7%
c) Poor drain		-					8%				-		4%
d) Pests		63%					23%				83%		48%
e) Diseases		63%					100%				50%		78%
f) Bird		13%					-				-		4%
g) Rat		50%					-				-		15%
h) Wild animal		-					-				-		-
(7) Okra													
a) Drought	23%	20%		14%		7%	-			-			13%
b) Flood	-	10%		-		7%	-			-			3%
c) Poor drain	-	-		-		-	-			-			-
d) Pests	92%	70%		86%		29%	57%			60%			67%
e) Diseases	69%	70%		21%		100%	43%			60%			62%
f) Bird	-	-		-		-	-			-			-
g) Rat	-	-		36%		14%	-			-			11%
h) Wild animal	-	-		-		-	-			-			-
(8) Onions													
a) Drought			13%							-			10%
b) Flood			25%							-			20%
c) Poor drain			-							-			-
d) Pests			50%							50%			50%
e) Diseases			100%							-			80%
f) Bird			-							-			-
g) Rat			-							-			-
h) Wild animal			-							-			-
(9) Hot Pepper													
a) Drought		50%	60%		-		-				100%		53%
b) Flood		100%	-		-		-				-		13%
c) Poor drain		-	20%		-		-				-		7%
d) Pests		50%	60%		-		33%				75%		53%
e) Diseases		-	80%		100%		67%				100%		73%
f) Bird		50%	-		-		-				-		7%
g) Rat		100%	-		100%		-				-		20%
h) Wild animal		-	-		-		-				-		-
(10) Tomatoes													
a) Drought		11%	25%				33%	100%	78%	-	50%	100%	51%
b) Flood		-	-				-	-	-	-	-	-	-
c) Poor drain		-	-				-	-	-	-	-	-	-
d) Pests		33%	-				33%	100%	44%	33%	100%	50%	51%
e) Diseases		22%	100%				33%	90%	78%	50%	50%	-	60%
f) Bird		-	-				-	-	-	-	-	-	-
g) Rat		44%	-				-	-	11%	-	-	-	11%
h) Wild animal		-	-				-	-	-	-	-	-	-
(11) Cowpea													
a) Drought		-								-	-		-
b) Flood		-								-	-		-
c) Poor drain		-								-	-		-
d) Pests		100%								100%	100%		100%
e) Diseases		-								50%	100%		50%
f) Bird		-								-	-		-
g) Rat		-								-	100%		25%
h) Wild animal		-								-	-		-
(12) Groundnuts													
a) Drought			25%	-						-		60%	24%
b) Flood			-	-						-		-	-
c) Poor drain			-	-						-		-	-
d) Pests			-	-						50%		-	18%
e) Diseases			25%	50%						17%		20%	24%
f) Bird			50%	-						-		80%	35%
g) Rat			50%	100%						-		80%	47%
h) Wild animal			-	-						-		-	-

Table A-1 Result of Farm Interview Survey (7/13)

Projects/No. of Samples / Question Items	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
Q-8 Income from Homestead in the Last One Year													
9.1 Income of crops grown in the homestead (CD1,000/farmer)													
Total Gross Income	24.8	540.4	38.6	31.9	133.2	45.8	-	9.4	51.4	135.2	7.8	35.6	90.1
Net Income (50%)	12.4	270.2	19.3	16.0	66.6	22.9	-	4.7	25.7	67.6	3.9	17.8	45.1
9.2 Income from perennial crops (CD1,000/farmer)													
Total Gross Income	-	-	-	0.5	12.3	3.3	9.8	25.0	-	46.4	-	-	9.0
Net Income (80%)	-	-	-	0.4	9.8	2.6	7.8	20.0	-	37.1	-	-	7.2
Total Net Income (CD1,000/farmer)	12.4	270.2	19.3	16.4	76.4	25.5	7.8	24.7	25.7	104.7	3.9	17.8	52.3
Q-9 Livestock Income (CD1,000/farmer)	9.3	13.6	33.4	88.1	75.5	10.4	8.0	127.0	33.9	11.6	152.0	48.9	45.7
Q-10 Non-Farm Income (CD1,000/farmer)													
(1) Salary from other occupation	65.4	36.8	-	48.0	77.6	67.3	-	-	18.0	7.2	106.0	-	36.8
(2) Wages from working on other farm	20.0	-	-	3.5	1.6	-	-	-	-	39.0	9.0	-	7.7
(3) Wages for casual worker	29.4	24.0	-	1.0	32.8	120.0	-	-	-	2.4	-	-	18.4
(4) Earnings from cottage industry	-	-	72.0	29.9	42.7	-	-	12.0	-	125.0	26.6	-	27.7
(5) Earnings from subsidiary business	-	140.0	12.0	5.8	14.4	376.8	-	4.1	-	58.2	85.0	74.7	61.3
(6) Receipt of gifts and remittance from relatives and others	36.0	14.7	10.0	0.4	4.9	24.0	-	4.0	-	14.1	-	12.0	10.7
(7) Hire for farm machinery, equipment and work animals	2.4	-	4.9	106.6	-	-	3.0	-	-	-	-	-	15.7
(8) Rent for farm land	-	-	-	-	-	-	-	-	-	-	-	-	-
(9) Interest earned from money loan	-	-	10.0	-	-	-	-	-	-	-	-	-	0.6
(10) Other non-farm income	3.0	32.0	54.0	9.9	66.8	-	21.6	-	-	30.0	36.0	-	20.7
Total	156.2	247.5	162.9	205.1	240.8	588.1	24.6	20.1	18.0	275.9	262.6	86.7	199.6
Q-11 Living Expenses and Loan Repayment													
11.1 Living Expenses (CD1,000/farmer)													
(1) Food	1,252	1,572	1,680	1,337	1,124	1,125	1,021	1,062	1,035	1,197	1,196	1,111	1,234
Rice	(116)	(208)	(84)	(239)	(74)	(46)	(34)	(33)	(100)	(206)	(47)	(103)	(122)
Cassava	(157)	(133)	(272)	(77)	(315)	(135)	(155)	(64)	(83)	(26)	(166)	(205)	(139)
Yam	(84)	(98)	(175)	(42)	(21)	(155)	(103)	(168)	(108)	(219)	(232)	(100)	(117)
Maize and other cereals	(177)	(154)	(99)	(196)	(85)	(104)	(132)	(35)	(35)	(168)	(122)	(113)	(131)
Vegetables and Fruits	(165)	(201)	(250)	(189)	(86)	(147)	(142)	(159)	(92)	(136)	(174)	(108)	(157)
Meat and Eggs	(126)	(156)	(87)	(170)	(92)	(156)	(62)	(271)	(236)	(168)	(73)	(103)	(141)
Fishes	(229)	(356)	(353)	(177)	(320)	(196)	(281)	(243)	(274)	(117)	(143)	(286)	(241)
Others	(198)	(266)	(360)	(247)	(131)	(186)	(112)	(89)	(107)	(157)	(239)	(93)	(186)
(2) Tobacco and cigarettes	3	-	-	1	4	-	1	98	7	9	1	4	8
(3) Soap, shampoo	80	78	123	45	58	64	51	73	57	59	47	57	64
(4) Electric charge	27	22	2	13	-	18	12	32	17	6	24	-	14
(5) Fuel woods	84	78	114	47	57	38	66	100	35	51	60	58	64
(6) Household furnishing & equipment	119	148	105	28	39	22	59	51	74	51	18	39	63
(7) Repair and maintenance of house	13	140	43	31	21	33	23	37	61	32	26	37	41
(8) Clothing	104	206	127	181	101	162	141	107	114	125	186	131	143
(9) Medicine and medical expenses	57	84	112	94	96	78	75	70	69	55	108	110	82
(10) Education	205	174	253	84	26	85	56	69	67	29	49	53	97
(11) Recreation	4	4	18	14	9	33	1	27	4	27	6	25	14
(12) Expenses for ceremonial occasions	48	173	67	37	21	42	32	32	78	72	52	55	58
(13) Transportation and communication	42	52	126	47	26	63	41	19	27	34	83	65	49
(14) TV and radio license	2	4	-	2	1	11	-	16	10	2	1	1	4
(15) Remittance to relatives	25	101	48	48	11	17	15	42	27	29	74	38	39
(16) Others	-	7	-	7	8	5	4	9	98	-	20	10	11
Total	2,065	2,843	2,818	2,016	1,602	1,796	1,598	1,844	1,780	1,778	1,951	1,794	1,985
11.2 Loan Repayment (CD1,000/farmer)	9	7	511	517	7	2	-	28	1	8	-	24	114

Table A-1 Result of Farm Interview Survey (8/13)

Question Items \ Projects/No. of Samples	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
Q-12 Farming Situation													
12.1 If irrigation water is available sufficiently throughout a year, which crops do you want to cultivate in the future ? (Plural answer)													
Wet Season													
(1) Paddy	90%	33%	-	100%	93%	-	50%	-	-	85%	10%	100%	56%
(2) Maize	30%	73%	100%	32%	53%	100%	60%	100%	80%	65%	100%	60%	65%
(3) Sorghum	-	-	-	-	7%	-	-	-	-	5%	-	10%	2%
(4) Cassava	5%	13%	30%	8%	40%	47%	35%	30%	90%	5%	40%	50%	28%
(5) Yam	-	-	-	-	-	40%	25%	10%	20%	5%	10%	-	9%
(6) Sweet Potatoes	-	20%	-	-	-	7%	30%	-	-	-	-	-	6%
(7) Mongo Beans	-	-	-	-	-	-	-	-	-	-	-	-	-
(8) Bush Beans	-	-	-	-	-	-	-	-	-	5%	-	-	1%
(9) Soybean	-	7%	-	8%	-	7%	5%	-	-	5%	10%	-	4%
(10) Sesame	-	-	-	-	-	-	-	-	-	-	-	-	-
(11) Groundnut	-	-	100%	-	7%	7%	-	-	10%	45%	-	30%	14%
(12) Lentil	-	-	-	-	7%	-	5%	-	-	5%	-	-	2%
(13) Cowpea	-	7%	70%	4%	27%	20%	10%	10%	-	5%	60%	-	14%
(14) White Cucumber	-	7%	-	-	-	-	-	-	-	-	-	10%	1%
(15) Green Cucumber	-	-	-	-	-	-	-	-	-	-	-	10%	1%
(16) Snake Cucumber	-	-	-	-	7%	-	-	-	-	5%	-	-	1%
(17) Bottle/Bitter Gourds	-	-	-	-	-	-	-	-	-	-	-	-	-
(18) Okra	40%	33%	-	24%	20%	40%	20%	-	-	5%	-	20%	19%
(19) Eggplant	-	27%	-	-	-	33%	15%	-	-	-	30%	-	8%
(20) Tomatoes	20%	53%	-	4%	13%	13%	40%	90%	20%	10%	-	30%	23%
(21) Butter Nuts	-	-	-	-	-	-	-	-	-	-	-	-	-
(22) Radish	-	-	-	-	-	-	-	-	-	-	-	-	-
(23) Onions	-	13%	-	16%	13%	7%	5%	-	-	-	-	-	6%
(24) Hot Pepper (Chilies)	5%	33%	70%	-	27%	13%	10%	-	-	-	-	10%	12%
(25) Bell pepper	-	-	-	4%	-	-	-	-	-	-	20%	-	2%
(26) Water Melon	-	-	10%	-	-	-	5%	-	-	-	-	-	1%
(27) Sweet Melon	-	-	-	-	-	-	-	-	-	-	-	-	-
(28) Cabbage	-	33%	-	-	13%	-	-	-	10%	-	-	20%	6%
(29) Other crops	-	20%	-	-	-	-	-	-	10%	-	-	-	2%
Dry Season													
(1) Paddy	60%	13%	-	80%	60%	-	10%	-	-	90%	-	40%	37%
(2) Maize	15%	13%	-	44%	20%	53%	15%	80%	10%	15%	10%	10%	24%
(3) Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-
(4) Cassava	-	-	-	-	13%	-	10%	-	-	-	-	10%	3%
(5) Yam	-	-	-	-	-	-	-	-	-	5%	-	-	1%
(6) Sweet Potatoes	-	20%	-	-	-	-	30%	-	-	-	-	-	5%
(7) Mongo Beans	-	-	-	-	-	-	-	-	-	5%	-	-	1%
(8) Bush Beans	-	-	-	-	-	-	-	-	-	-	-	-	-
(9) Soybean	-	-	-	-	7%	7%	-	-	-	5%	-	-	2%
(10) Sesame	-	-	-	-	-	-	-	-	-	-	-	-	-
(11) Groundnut	-	7%	-	-	-	7%	-	-	-	5%	-	-	2%
(12) Lentil	-	-	-	-	-	-	-	-	-	-	-	-	-
(13) Cowpea	5%	13%	-	-	13%	7%	15%	50%	10%	25%	10%	-	12%
(14) White Cucumber	-	-	-	-	-	-	-	-	-	-	-	-	-
(15) Green Cucumber	10%	7%	-	-	-	7%	-	-	-	-	-	10%	3%
(16) Snake Cucumber	-	-	-	-	-	-	-	-	-	5%	-	-	1%
(17) Bottle/Bitter Gourds	-	-	-	-	-	-	-	-	-	-	-	-	-
(18) Okra	75%	60%	10%	48%	60%	100%	60%	-	30%	50%	60%	80%	56%
(19) Eggplant	-	53%	20%	4%	20%	60%	25%	-	60%	10%	90%	-	25%
(20) Tomatoes	5%	20%	100%	20%	60%	27%	20%	100%	80%	50%	30%	70%	41%
(21) Butter Nuts	-	-	-	-	-	-	-	-	-	5%	-	-	1%
(22) Radish	-	-	-	-	-	-	-	-	-	-	-	-	-
(23) Onions	5%	-	100%	32%	13%	20%	10%	-	-	45%	-	-	19%
(24) Hot Pepper (Chilies)	40%	33%	60%	-	27%	13%	5%	-	-	-	20%	50%	18%
(25) Bell pepper	-	-	-	-	-	7%	-	-	-	-	10%	-	1%
(26) Water Melon	25%	20%	-	-	7%	-	65%	-	40%	-	-	10%	15%
(27) Sweet Melon	-	7%	-	-	-	-	5%	-	-	-	-	-	1%
(28) Cabbage	-	53%	70%	-	13%	33%	15%	-	-	-	-	50%	17%
(29) Other crops	-	67%	-	-	-	7%	-	-	-	-	-	-	6%
12.2 What are problems on farming ? (Plural answer)													
(1) Low yield of crops	35%	40%	20%	88%	20%	20%	20%	70%	40%	35%	30%	40%	40%
(2) Levelling problem of paddy field	5%	13%	-	88%	20%	-	-	-	-	10%	-	20%	18%
(3) Drainage problem	15%	40%	-	56%	13%	-	-	-	10%	10%	-	10%	16%
(4) Drought damage	40%	40%	90%	12%	93%	-	-	90%	60%	-	60%	70%	38%
(5) Damage of pests and diseases	30%	60%	50%	68%	-	87%	20%	20%	40%	25%	20%	10%	38%
(6) Weed damages	20%	40%	-	48%	-	-	5%	-	-	40%	20%	20%	19%
(7) Damage by wild animal	-	13%	-	-	-	-	-	-	-	10%	-	10%	3%
(8) Difficulty for hireling animal/machine	45%	73%	-	16%	60%	67%	15%	-	-	60%	30%	40%	36%
(9) Labour shortage	10%	27%	-	4%	-	-	-	-	-	5%	10%	-	5%
(10) Difficulty for obtaining seeds	-	7%	10%	8%	7%	-	-	-	-	10%	-	10%	4%
(11) Difficulty for purchasing agro-chemicals	35%	20%	60%	52%	33%	100%	5%	10%	20%	30%	-	20%	34%
(12) Difficulty for purchasing fertilizers	50%	27%	50%	64%	60%	73%	5%	-	10%	45%	10%	30%	39%
(13) Expensive of farm inputs	40%	100%	60%	96%	53%	80%	70%	100%	80%	60%	60%	90%	73%
(14) Lack of farm road	-	13%	90%	16%	-	-	-	-	-	20%	-	-	11%
(15) Marketing problems for products	25%	67%	50%	12%	47%	33%	50%	60%	80%	30%	20%	30%	39%
(16) Lack of storage facilities	10%	33%	20%	12%	13%	-	15%	-	10%	20%	-	30%	14%
(17) Loan problems	85%	73%	80%	72%	87%	93%	65%	100%	90%	75%	40%	90%	78%
(18) Others	35%	20%	-	-	-	20%	-	-	-	5%	-	-	8%

Table A-1 Result of Farm Interview Survey (9/13)

Question Items \ Projects/No. of Samples	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
12.3 Which items do you want to improve your present farm management ? (Plural answer)													
(1) To acquire irrigation water	-	-	20%	12%	-	7%	10%	10%	90%	5%	30%	100%	18%
(2) To improve irrigation facilities	70%	60%	100%	88%	100%	93%	80%	100%	100%	25%	70%	100%	79%
(3) To drain out excess water	5%	27%	-	68%	7%	-	-	-	10%	10%	-	20%	16%
(4) To prevent pests and diseases	15%	60%	50%	52%	-	27%	25%	-	20%	40%	20%	10%	29%
(5) To prevent damage by wiled animal	-	20%	-	8%	-	-	-	-	-	5%	10%	10%	4%
(6) To prevent weed damage	5%	33%	10%	52%	-	-	-	-	-	45%	30%	10%	18%
(7) To improve supply of farm inputs	45%	40%	20%	92%	73%	93%	55%	90%	90%	75%	40%	50%	63%
(8) To improve farm road	-	27%	90%	32%	-	-	-	-	-	10%	-	-	13%
(9) To improve transportation of products	-	7%	50%	12%	-	-	10%	-	-	25%	10%	-	9%
(10) To introduce improved varieties	35%	40%	60%	56%	20%	7%	-	-	20%	25%	10%	-	25%
(11) To improve farming practices	-	20%	20%	40%	7%	20%	10%	-	-	35%	-	10%	16%
(12) To introduce mechanized farming	15%	67%	-	32%	40%	-	30%	-	20%	20%	20%	40%	25%
(13) To strengthen agricultural extension	-	40%	30%	56%	7%	7%	10%	-	-	20%	-	50%	20%
(14) To improve agricultural credit	70%	80%	80%	76%	60%	87%	50%	90%	100%	55%	30%	70%	69%
(15) To construct drying floor	-	20%	-	20%	27%	-	-	-	-	10%	-	70%	12%
(16) To construct processing facilities	-	27%	-	24%	-	-	5%	-	30%	20%	-	10%	11%
(17) To construct storage facilities	20%	27%	20%	20%	27%	-	5%	-	30%	20%	10%	40%	18%
(18) Others	10%	13%	-	4%	-	-	-	-	-	5%	-	-	3%
Q-13 Prices (As of November-December 1995)													
13.1 Hired labour charge (CD1,000/man-day)	2.9	2.0	2.5	2.8	2.2	2.1	2.0	2.5	2.1	1.1	1.7	2.5	2.1
13.2 Hired/Rental charge of tractor/machinery (CD1													
Ploughing (CD1,000/ha)	64.8	33.8	45.0	61.3	43.3	50.0	35.3	40.0	40.0	39.8	38.0	29.3	45.3
Harrowing (CD1,000/ha)	32.0	21.5	24.3	30.3	36.5	25.0	15.5	40.0	40.0	20.3	37.5	16.3	26.5
Levelling (CD1,000/ha)	-	21.8	-	-	-	-	-	-	-	20.8	-	-	21.0
Furrowing (CD1,000/ha)	21.8	27.5	-	28.8	-	-	-	47.5	-	20.3	-	-	28.0
Threshing (CD1,000/ha)	40.0	-	-	40.8	-	-	-	-	-	62.5	25.0	-	47.0
Total Transportation Cost	3.9	81.7	10.0	5.8	7.9	10.0	24.0	20.0	26.7	1.1	13.8	5.7	12.5
13.3 Purchasing prices of farm inputs													
Fertilizers													
Urea (CD1,000/kg)	0.42	0.57	0.32	0.64	0.45	0.56	-	0.60	0.60	0.53	0.56	0.42	0.53
Ammonium Sulfate (CD1,000/kg)	0.39	0.38	0.36	0.44	0.35	0.51	0.42	0.34	0.36	0.33	0.38	0.36	0.38
Compound fertilizers (CD1,000/kg)	0.47	0.49	0.47	0.64	0.50	0.56	0.49	0.48	0.42	0.46	0.48	0.48	0.51
Agro-chemicals													
Herbicide (CD1,000/lit.)	8.9	6.0	-	6.2	5.3	12.0	-	22.0	-	6.8	24.0	-	7.9
Insecticide (CD1,000/lit.)	10.4	22.7	9.8	5.8	2.4	18.6	10.9	23.3	18.0	11.4	20.0	19.8	13.9
Fungicide (CD1,000/lit.)	-	0.5	12.7	-	3.3	0.4	9.3	13.0	11.6	11.7	12.0	-	8.0
13.4 Milling charge of paddy (CD/kg of paddy)	20	16	-	47	14	-	-	-	-	23	-	24	28
Q-14 Credit/Loan													
14.1 Did you have loan ?													
No	20%	80%	20%	36%	33%	93%	83%	60%	90%	70%	88%	100%	61%
Yes	80%	20%	80%	64%	67%	7%	17%	40%	10%	30%	13%	-	39%
What purpose did you take loan ?													
(1) Loan for purchasing farm inputs	36%	50%	64%	70%	56%	100%	50%	100%	100%	33%	-	-	52%
(2) Loan for hiring machinery	34%	25%	36%	22%	44%	-	50%	-	-	33%	-	-	32%
(3) Loan for purchasing farm machinery	-	-	-	4%	-	-	-	-	-	-	-	-	1%
(4) Loan for purchasing livestock	-	-	-	-	-	-	-	-	-	-	-	-	-
(5) Loan for living	30%	-	-	4%	-	-	-	-	-	-	-	-	12%
(6) Others (Specify)	-	25%	-	-	-	-	-	-	-	33%	-	-	3%
14.2 How much its total debt amount ?													
(1) Less than CD100,000	7%	33%	-	6%	60%	-	50%	-	100%	75%	100%	-	23%
(2) CD100,000 - CD500,000	87%	67%	50%	56%	40%	100%	50%	100%	-	25%	-	-	60%
(3) CD500,000 - CD1,000,000	7%	-	13%	25%	-	-	-	-	-	-	-	-	9%
(4) Over CD1,000,000	-	-	38%	13%	-	-	-	-	-	-	-	-	8%
14.3 From whom did you borrowed ? (Plural answer)													
(1) Bank	6%	-	100%	-	-	100%	100%	-	50%	-	-	-	17%
(2) Middleman/broker of farm products	94%	33%	-	72%	100%	-	-	-	-	17%	-	-	57%
(3) Merchant	-	-	-	11%	-	-	-	-	-	-	-	-	3%
(4) Rice Miller	-	-	-	-	-	-	-	-	-	-	-	-	-
(5) Land owner	-	-	-	-	-	-	-	-	-	-	-	-	-
(6) Relatives	-	33%	-	17%	-	-	-	-	50%	33%	100%	-	11%
(7) Other farmer	-	-	-	-	-	-	-	-	-	17%	-	-	1%
(8) Others	-	33%	-	-	-	-	-	100%	-	33%	-	-	10%
14.4 Interest and repayment method (Include both bank and private loans, 1994-1995)													
(1) Interest per one season (%/season)	19%	-	30%	87%	70%	-	18%	-	-	-	30%	-	51%
(2) Repayment a) Cash	15%	100%	100%	50%	-	100%	100%	100%	100%	80%	100%	-	
b) In kind	85%	-	-	50%	100%	-	-	-	-	20%	-	-	
14.5 Did you pay its debt ?													
Yes	87%	67%	75%	100%	80%	-	100%	80%	-	83%	-	-	82%
No	13%	33%	25%	-	20%	100%	-	20%	100%	17%	100%	-	18%
In case of "No", why didn't you pay ? (Plural answer)													
(1) Because of no money.	-	-	-	-	-	-	-	-	100%	25%	100%	-	30%
(2) Because its amount is very expensive.	-	-	-	-	-	-	-	-	-	25%	-	-	10%
(3) Distance from my house to bank is very far. I can't go to the bank for payment.	-	-	-	-	-	-	-	-	-	-	-	-	-
(4) Bank staff must come to my house for collecting its money.	-	-	-	-	-	-	-	-	-	25%	-	-	10%
(5) Because neighboring farmers and/or my friends don't pay also its debt.	-	-	-	-	-	-	-	-	-	-	-	-	-
(6) No reason. If the bank staff come to my house, I will pay its debt.	-	-	-	-	-	-	-	-	-	-	-	-	-
(7) No reason, anyhow I don't like to pay debt.	-	-	-	-	-	-	-	-	-	-	-	-	-
(8) Others	100%	100%	-	-	-	-	-	100%	-	25%	-	-	50%

Table A-1 Result of Farm Interview Survey (10/13)

Question Items \ Projects/No. of Samples	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
Q-15 Operation and Maintenance of Existing Irrigation System													
15.1 Can you satisfy with quantity of water received at last season ?													
Yes	20%	27%	-	56%	-	-	17%	-	-	95%	11%	10%	26%
No	80%	73%	100%	44%	100%	100%	83%	100%	100%	5%	89%	90%	74%
15.2 Did you receive irrigation water on time ?													
Yes	25%	60%	-	92%	7%	-	33%	-	-	56%	22%	60%	36%
No	75%	40%	100%	8%	93%	100%	67%	100%	100%	44%	78%	40%	64%
15.3 What problems do you have in your irrigation system ? (Plural answer)													
(1) Leakage of pound, gates and pipes.	95%	53%	100%	52%	33%	93%	80%	100%	80%	25%	70%	10%	64%
(2) Damages of canal.	85%	7%	-	40%	100%	-	-	-	20%	15%	20%	40%	30%
(3) Not operating or broken pump.	5%	80%	10%	4%	67%	27%	20%	10%	90%	-	60%	-	27%
(4) Not operating or broken gates.	-	-	-	20%	7%	-	-	-	-	-	-	20%	4%
(5) No water measuring devices.	-	7%	20%	8%	-	-	5%	10%	-	65%	-	60%	14%
(6) Weeds, soil and inert matter gathered in canals.	50%	33%	-	24%	-	-	-	-	-	35%	-	10%	16%
(7) Intake, pump & diversion structures and other structures are damaged/broken.	65%	47%	100%	16%	47%	80%	30%	90%	-	5%	80%	10%	43%
(8) Illegal water usage by the farmers.	35%	7%	-	56%	13%	-	-	-	-	40%	-	20%	19%
(9) Water taking to cultivate some crops in the reservation area.	5%	-	-	-	-	-	-	-	-	-	-	20%	2%
(10) Water is controlled by specific farmers.	5%	-	-	4%	-	-	-	-	-	25%	-	-	4%
(11) GIDA doesn't distribute water equally.	-	-	-	-	-	-	-	-	-	25%	-	20%	4%
(12) Others	5%	27%	30%	4%	7%	67%	5%	-	90%	5%	90%	-	22%
15.4 Do you think that it is necessary to change the quantity of water distribute to farmers ?													
Yes	80%	64%	100%	32%	100%	100%	83%	100%	100%	26%	100%	100%	76%
No	20%	36%	-	68%	-	-	17%	-	-	74%	-	-	24%
If "Yes", (1) Increasing by two times	20%	27%	30%	-	100%	100%	20%	100%	100%	-	78%	100%	60%
(2) Increasing a little	80%	73%	70%	100%	-	-	80%	-	-	100%	22%	-	40%
(3) Decreasing a little	-	-	-	-	-	-	-	-	-	-	-	-	-
15.5 Do you have any problems on irrigation schedule decided by GIDA?													
Yes	75%	53%	100%	4%	93%	100%	67%	100%	100%	50%	100%	20%	65%
No	25%	47%	-	96%	7%	-	33%	-	-	50%	-	80%	35%
If "Yes", what are the reasons ? (Plural answer)													
(1) I can't cultivate crops within the period decided by GIDA, because of labour shortage.	-	-	-	-	-	-	-	-	-	-	-	-	-
(2) I can't cultivate crops according to the GIDA's irrigation schedule, because farm inputs are not available in right time.	5%	-	20%	-	-	-	-	-	-	15%	-	20%	4%
(3) I can't cultivate crops according to its schedule, because loan/ credits are not available in the right time.	25%	7%	50%	-	-	7%	15%	-	-	-	-	20%	9%
(4) No irrigation water is available in right time.	25%	-	-	-	13%	13%	5%	10%	90%	-	80%	20%	17%
(5) Because of unstable irrigation water supply.	55%	27%	90%	-	93%	93%	35%	100%	-	35%	80%	-	47%
(6) Because of delayed water supply by GIDA.	45%	7%	50%	4%	80%	67%	35%	100%	90%	35%	90%	20%	46%
(7) I don't know its irrigation schedule, because of no information by GIDA.	5%	-	-	-	13%	13%	-	-	-	-	-	-	3%
(8) I don't like its irrigation schedule.	45%	-	-	-	60%	60%	5%	100%	100%	5%	90%	-	32%
(9) Others	-	20%	-	-	-	-	-	-	10%	15%	-	-	4%
15.6 Do you think irrigation water is distributed uniformly among the farmers ?													
Yes	15%	67%	78%	80%	7%	100%	100%	11%	-	42%	56%	90%	56%
No	85%	33%	22%	20%	93%	-	-	89%	100%	58%	44%	10%	44%
If "No", what are the reasons ? (Plural answer)													
(1) Illegal water path.	75%	-	-	-	53%	-	-	80%	-	5%	-	-	18%
(2) Close the canal partially by putting stone, soil etc.	50%	-	-	4%	13%	-	-	-	-	35%	-	-	11%
(3) Wrong opening of turnout gates.	5%	-	-	-	7%	-	-	90%	-	40%	-	10%	11%
(4) Damage of turnouts.	-	7%	-	-	60%	-	-	-	-	5%	-	-	6%
(5) Water passing to drainage canal due to damage or holes of canal bank.	65%	7%	-	-	67%	-	-	-	-	-	-	-	13%
(6) There are soil and weeds in the canal because of not cleaning.	-	-	-	8%	-	-	-	-	-	5%	-	-	2%
(7) Others	25%	20%	10%	-	7%	-	-	-	100%	10%	30%	-	14%
15.7 Farmers participation to O&M													
(1) Have you been engaged in any maintenance work for canal, structures and O&M road before starting irrigation supply ?													
Yes	100%	73%	100%	100%	100%	100%	94%	100%	100%	95%	100%	100%	97%
No	-	27%	-	-	-	-	6%	-	-	5%	-	-	3%
(2) Do you think that cleaning and repairing of field canal, canal bank and structure (If there is a minor damage) are your responsibilities ?													
Yes	100%	100%	100%	100%	100%	100%	100%	100%	100%	90%	100%	100%	99%
No	-	-	-	-	-	-	-	-	-	10%	-	-	1%
(3) Have you investigated irrigation facilities regularly during irrigation period ?													
Yes	90%	71%	100%	100%	93%	100%	94%	100%	100%	75%	89%	100%	92%
No	10%	29%	-	-	7%	-	6%	-	-	25%	11%	-	8%

Table A-1 Result of Farm Interview Survey (11/13)

Question Items \ Projects/No. of Samples	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
(4) Did you look in your village that some farmers damage irrigation facilities when they feel not enough water or during water shortage ?													
Yes	15%	-	-	46%	7%	-	-	11%	-	21%	-	-	12%
No	85%	100%	100%	54%	93%	100%	100%	89%	100%	79%	100%	100%	88%
(5) If you observe a minor damage of canal and bui													
a) Repairing by myself	90%	73%	100%	96%	93%	100%	50%	100%	80%	80%	90%	100%	86%
b) Not repairing by myself	-	-	-	-	-	-	-	-	10%	5%	10%	10%	2%
c) Informed to the project office	95%	67%	90%	92%	80%	100%	60%	90%	90%	90%	70%	80%	84%
d) Leave to waste of irrigation water	-	-	-	-	-	-	-	-	10%	-	-	-	1%
15.8 Do you clean the drainage canal every season (before starting the season) to keep low water table in the drainage canal to prevent problems like salinity ?													
Yes	-	53%	100%	24%	100%	-	100%	100%	100%	89%	100%	50%	66%
No	100%	47%	-	76%	-	-	-	-	-	11%	-	50%	34%
Q-16 Existing Farmer's Organization for Operation and Maintenance (O&M) of Irrigation Facilities													
16.1 What are purposes of the farmers organization in your irrigation area ?													
(1) O&M of irrigation facilities	100%	100%	80%	84%	100%	100%	20%	60%	100%	75%	90%	70%	81%
(2) Cooperative purchasing of farm inputs and cooperative shipping of products	95%	80%	80%	48%	60%	100%	75%	90%	100%	95%	70%	100%	81%
(3) Loan arrangement to the farmer	65%	60%	40%	36%	80%	93%	85%	80%	100%	70%	80%	60%	69%
(4) Social activities to the village people	-	7%	20%	8%	-	7%	-	50%	50%	20%	20%	-	12%
16.2 What are problems for activities of the farmers organization in your irrigation area ?													
(1) Almost no function to operate and maintain the irrigation facilities.	-	27%	20%	-	20%	13%	15%	-	-	5%	10%	20%	10%
(2) The farmers have no interest to the organization activities.	-	-	-	20%	13%	-	-	-	-	5%	-	-	4%
(3) No leaders	-	-	-	-	7%	-	-	-	-	-	-	-	1%
(4) No fund to operate and maintain the irrigation facilities	95%	87%	100%	52%	87%	93%	85%	100%	90%	95%	90%	100%	87%
(5) No definitive articles and by laws for farmers activities	-	20%	50%	-	-	-	-	-	-	5%	-	-	5%
(6) No participation to the farmer's organizations	-	-	-	24%	-	-	-	-	-	-	-	-	3%
16.3 Irrigation service charge													
(1) Do you know irrigation service charge ?													
Yes	100%	100%	100%	100%	100%	100%	94%	100%	100%	100%	100%	100%	99%
No	-	-	-	-	-	-	6%	-	-	-	-	-	1%
(2) Do you know the amount of irrigation service charge ?													
Yes	100%	100%	100%	100%	87%	100%	100%	100%	100%	100%	100%	100%	99%
No	-	-	-	-	13%	-	-	-	-	-	-	-	1%
In case of "Yes", please answer its amount per one season or a year.													
One season (CD1,000/ha)	55	-	500	50	49	260	90	165	280	62	300	50	-
One year (CD1,000/ha)	88	523	-	60	79	266	79	165	280	121	300	50	-
(3) How do you think about amount of irrigation service charge ?													
a) Very cheep	-	-	-	-	-	-	-	-	-	-	-	-	-
b) Cheep	-	-	-	-	13%	7%	-	-	-	5%	-	-	2%
c) Moderate	95%	7%	67%	96%	47%	73%	25%	10%	-	65%	67%	-	53%
d) Expensive	5%	27%	33%	4%	27%	20%	38%	90%	-	20%	22%	70%	26%
e) Very expensive	-	67%	-	-	13%	-	38%	-	100%	10%	11%	30%	19%
(4) Do you like to pay irrigation service charge ?													
Yes	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
No	-	-	-	-	-	-	-	-	-	-	-	-	-
(5) Do you know the necessity for irrigation service charge ?													
Yes	100%	100%	100%	92%	100%	100%	100%	100%	100%	95%	100%	100%	98%
No	-	-	-	8%	-	-	-	-	-	5%	-	-	2%
In case of "Yes", please could you explain its necessity. (Plural answer)													
a) O&M costs of all irrigation facilities are covered by the irrigation service charge which is collected from farmers.	-	53%	30%	60%	20%	13%	50%	100%	100%	25%	10%	-	37%
b) O&M costs of distribution and field canals are covered by irrigation service charge.	95%	73%	90%	84%	93%	100%	40%	80%	100%	90%	90%	100%	84%
c) A part of salary of GIDA's staff are covered by this irrigation service charge.	10%	7%	-	4%	-	-	-	-	-	-	-	-	2%
d) It is same with tax.	15%	-	-	8%	-	-	-	-	-	-	-	-	3%
e) Loan repayment for construction cost of all irrigation facilities have been covered by the irrigation service charge.	-	-	-	24%	-	-	-	10%	-	-	-	-	4%
f) It is the depreciation cost of irrigation facilities.	-	13%	-	-	-	-	10%	-	-	5%	-	-	3%
g) It is one of the incomes of GIDA for operation and management of irrigation facilities.	70%	73%	80%	68%	47%	93%	10%	-	100%	45%	-	100%	57%
h) Others	-	-	-	-	-	-	5%	-	-	-	-	-	1%

Table A-1 Result of Farm Interview Survey (12/13)

Question Items \ Projects/No. of Samples	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
(6) Do you agree to pay irrigation service charges with present basis which you are followed ?													
Yes	100%	87%	100%	100%	100%	100%	94%	100%	-	100%	100%	60%	90%
No	-	13%	-	-	-	-	6%	-	100%	-	-	40%	10%
(7) Did you pay irrigation service charge ?													
Yes	100%	80%	100%	100%	93%	100%	100%	100%	100%	100%	100%	100%	98%
No	-	20%	-	-	7%	-	-	-	-	-	-	-	2%
In case of "No", why didn't you pay ? (Plural answer)													
a) Because of no money.	-	33%	-	-	100%	-	-	-	-	-	-	-	13%
b) Because its amount is very expensive.	-	33%	-	-	-	-	-	-	-	-	-	-	7%
c) Distance from my house to the project office is very far. I can't go to the office for payment.	-	-	-	-	-	-	-	-	-	-	-	-	-
d) Staff of GIDA (project office) must come to my house for collecting its money.	-	-	-	-	-	-	-	-	-	-	-	-	-
e) I could not pay the irrigation service charge, because I don't know how to pay its charge. (How much its charge; to whom I must pay it; when pay its money.)	-	-	-	-	-	-	-	-	-	-	-	-	-
f) Because neighboring farmers and/or my friends don't pay also its charge.	-	-	-	-	-	-	-	-	-	-	-	-	-
g) Neighboring farmers and/or my friends suggested to me that no need its payment because of no obligation.	-	-	-	-	-	-	-	-	-	-	-	-	-
h) No reason, if staff of GIDA (project office) come to my house, I will pay its charge.	-	-	-	-	-	-	-	-	-	-	-	-	-
i) I don't agree to the irrigation service charge, because irrigation water must be supplied by the government under free of charge.	-	-	-	-	-	-	-	-	-	-	-	-	-
j) If irrigation facilities are repaired by GIDA, I will pay the irrigation service charge.	-	-	-	-	100%	-	-	-	-	-	-	-	7%
k) If irrigation water is available timely and sufficiently, I will pay the irrigation service charge.	-	-	-	-	100%	-	-	-	-	-	-	-	7%
l) All of irrigation service charge collected from GIDA are going to the Accra head office, and no re-investment for improving our irrigation facilities is done by GIDA. Therefore, I don't like to pay the irrigation service charge.	-	-	-	-	-	-	-	-	-	-	-	-	-
m) I never pay its charge to the staff of GIDA, because I don't like them.	-	-	-	-	-	-	-	-	-	-	-	-	-
n) No reason, anyhow I don't like to pay the irrigation service charge.	-	-	-	-	-	-	-	-	-	-	-	-	-
o) Others	-	100%	-	-	-	-	-	-	-	-	-	-	20%
(8) At present, GIDA has a problem that many farmers do not pay its irrigation service charge. What is the difficulty to pay the irrigation service charge on time ? (Plural answer)													
a) Very low harvest.	95%	67%	20%	100%	87%	100%	55%	100%	100%	85%	70%	90%	82%
b) Farmers think no need to pay.	5%	-	-	-	-	-	-	-	60%	10%	-	-	5%
c) Our income is not enough to pay.	30%	67%	10%	80%	67%	100%	60%	90%	100%	95%	10%	90%	68%
d) O&M charges are very much.	10%	53%	20%	4%	7%	-	-	10%	90%	15%	10%	-	16%
e) O&M must be done by GIDA.	-	7%	-	-	7%	-	5%	-	60%	-	-	-	5%
f) After solving the problems in the field, farmers like to pay.	-	27%	20%	16%	13%	-	-	90%	100%	5%	-	20%	19%
g) Not receiving enough water.	55%	7%	10%	16%	67%	13%	15%	10%	40%	-	40%	60%	26%
h) Not receiving water on time.	35%	7%	10%	-	60%	-	-	-	30%	-	40%	40%	16%
i) Others	15%	-	10%	-	-	-	-	-	-	5%	-	10%	3%
16.4 Farmers' Opinion to the Turn Over of O&M to the Farmers' Organization													
(1) If GIDA will turnover all of operation and maintenance of irrigation facilities to your farmer's organization, do you agree on its turnover ?.													
Yes	10%	53%	10%	8%	33%	-	28%	-	-	15%	-	-	15%
No	90%	47%	90%	92%	67%	100%	72%	100%	100%	85%	100%	100%	85%
(2) Do you participate to its organization ?.													
Yes	95%	100%	100%	100%	100%	100%	100%	100%	100%	90%	100%	100%	98%
No	5%	-	-	-	-	-	-	-	-	10%	-	-	2%

Table A-1 Result of Farm Interview Survey (13/13)

Question Items \ Projects/No. of Samples	ASH 20	WEI 15	AMA 10	AFI 25	AVE 15	KPA 15	MAN 20	AKU 10	TAN 10	BON 20	SUB 10	OKY 10	Whole 180
(3) How do you think about O&M of the irrigation facilities by the farmers' organization ? (Plural answer)													
a) Such farmer's organization can't operate and maintain all of the irrigation facilities.	85%	47%	90%	92%	67%	100%	20%	90%	80%	100%	80%	80%	77%
b) If GIDA makes advice and technical support to O&M of irrigation facilities, it is possible.	85%	80%	90%	72%	80%	100%	65%	90%	100%	90%	90%	70%	78%
c) The farmer's organization can't operate and maintain all the facilities, but part of facilities will be possible.	75%	87%	100%	68%	67%	87%	45%	80%	80%	90%	70%	80%	76%
d) O&M costs are covered by irrigation service charge which is collected from the members. But it is difficult to collect from the members, because they don't pay its money. Thereby, its turnover is impossible.	80%	67%	-	12%	13%	20%	15%	90%	100%	5%	-	50%	34%
e) If GIDA collect irrigation service charge from the farmers, the farmers organization can operate and maintain the facilities.	10%	27%	-	-	-	7%	-	10%	-	5%	-	-	5%
f) O&M of facilities will be difficult technically, even if GIDA makes its advice and technical support.	10%	33%	-	-	-	-	-	-	-	10%	-	30%	7%
g) Any how, GIDA should be operate and maintain all of the facilities, because it is government's duty.	-	13%	-	-	-	-	-	-	-	-	-	-	1%
h) Others	-	7%	-	-	7%	-	-	20%	-	10%	-	-	3%
Q-17 Farmers' Opinion on Turn Over of O&M to Farmers' Organization													
17.1 Do you need the rehabilitation of irrigation facilities ?													
Yes	100%	100%	100%	100%	93%	100%	100%	100%	100%	100%	100%	100%	99%
No	-	-	-	-	7%	-	-	-	-	-	-	-	1%
17.2 If GIDA will proposed to establish the farmer's organization for operation and maintenance of irrigation facilities:													
(1) Do you agree ?													
Yes	84%	93%	80%	88%	67%	100%	100%	100%	100%	95%	100%	90%	91%
No	16%	7%	20%	12%	33%	-	-	-	-	5%	-	10%	9%
(2) If your village chief agreed its establishment, do you agree also ?													
Yes	85%	93%	100%	92%	71%	100%	100%	100%	100%	95%	100%	89%	93%
No	15%	7%	-	8%	29%	-	-	-	-	5%	-	11%	7%
(3) Do you participate to its farmer's organization ?													
Yes	100%	100%	100%	100%	100%	100%	100%	100%	100%	95%	100%	100%	99%
No	-	-	-	-	-	-	-	-	-	5%	-	-	1%
(4) If your village chief said you to participate to the organization, do you follow it ?													
Yes	100%	100%	100%	96%	100%	100%	100%	90%	100%	100%	100%	100%	99%
No	-	-	-	4%	-	-	-	10%	-	-	-	-	1%
17.3 If GIDA will hand over the operation and maintenance of the irrigation facilities:													
(1) Do you agree ?													
Yes	15%	73%	80%	40%	67%	-	89%	90%	-	85%	100%	70%	56%
No	85%	27%	20%	60%	33%	100%	11%	10%	100%	15%	-	30%	44%
(2) If your village chief agreed its hand over, do you agree also ?													
Yes	20%	73%	60%	48%	67%	-	88%	89%	-	90%	100%	50%	56%
No	80%	27%	40%	52%	33%	100%	12%	11%	100%	10%	-	50%	44%
17.4 There are following two types for handing over of operation and maintenance. Which type do you like ?													
(1) Handing over to the farmer's organization	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
(2) Handing over to village community headed by village chief.	-	-	-	-	-	-	-	-	-	-	-	-	-
Q-18 Farmers' Organization for Production and Marketing													
18.1 Do you know farmers' organization for marketing													
Yes	75%	69%	30%	12%	40%	7%	6%	60%	-	47%	88%	80%	40%
No	25%	31%	70%	88%	60%	93%	94%	40%	100%	53%	13%	20%	60%
18.2 Farmers' Intention to Marketing Organization													
(1) Do you participate to this organization ?													
Yes	100%	100%	100%	100%	93%	100%	100%	100%	90%	95%	100%	90%	98%
No	-	-	-	-	7%	-	-	-	10%	5%	-	10%	2%
(2) What activities/services do you want to this organization ? (Plural answer)													
a) Farm inputs supply	95%	100%	80%	84%	100%	100%	85%	100%	30%	85%	90%	60%	86%
b) Farm machinery services	95%	100%	80%	88%	80%	93%	50%	-	80%	60%	80%	70%	75%
c) Hiring services of draft cattle	-	-	-	-	-	7%	-	10%	-	20%	-	-	3%
d) Transportation services for products	25%	33%	70%	24%	20%	-	15%	70%	-	30%	60%	-	27%
e) Information services for marketing	35%	53%	70%	64%	60%	80%	30%	70%	100%	45%	60%	20%	55%
f) Extension services	25%	87%	40%	92%	47%	-	30%	50%	-	40%	20%	60%	44%
g) Supply of draft cattle	-	-	-	-	7%	-	-	20%	-	5%	-	-	2%
h) Cooperative shipping of products	15%	60%	50%	-	7%	-	5%	80%	100%	15%	20%	-	23%
i) Cooperative purchasing of farm inputs	30%	87%	60%	40%	33%	20%	45%	80%	90%	75%	90%	100%	57%
j) Others	70%	27%	-	4%	-	80%	-	-	-	20%	-	-	19%

Table A-2 Meteorological Data

Project	Rainfall	Temperature	R. Humidity	Sunshine Duration	Wind Speed	Evaporation
1 Ashaiman	a) Tema (61-94) b) Ashaiman (92-95)	a) Tema (61-90)	a) Tema (61-90)	a) Accra (61-90)	a) Tema (61-90)	a) Ashaiman (92-95)
2 Weija	a) Weija (85-92) b) Accra (61-94)	a) Accra (61-90)	a) Accra (61-90)	a) Accra (61-90)	a) Accra (61-90)	
3 Amate	a) Koforidua (61-94)	a) Koforidua (61-90)	a) Koforidua (61-90)	a) Koforidua (61-90)	a) Koforidua (61-90)	
4 Afife	a) Afife (80-94) b) Ada (61-90) c) Akatui (61-89)	a) Ada (61-90) b) Akatui (85-94)	a) Ada (61-90)	a) Ada (61-90)	a) Ada (61-90)	
5 Aveyime	a) Aveyime (80-94) b) Akuse (82-87)	a) Akuse (61-90) b) Aveyime (85-92)	a) Akuse (61-90)	a) Akuse (61-90)	a) Akuse (61-90)	
6 Kpandu-Torkor	a) Kpandu (80-94) b) Ho (61-90)	a) Ho (61-90)	a) Ho (61-90)	a) Ho (61-90)	a) Ho (61-90)	
7 Mankessim	a) Saltpond (61-94)	a) Saltpond (61-90)	a) Saltpond (61-90)	a) Saltpond (61-90)	a) Saltpond (61-90)	
8 Akumadan	a) Wenchi (61-94) b) Akumadan (88-95)	a) Wenchi (61-90)	a) Wenchi (61-90)	a) Wenchi (61-90)	a) Wenchi (61-90)	
9 Tanoso	a) Tanoso (90-93) b) Wenchi (61-94)	a) Wenchi (61-90)	a) Wenchi (61-90)	a) Wenchi (61-90)	a) Wenchi (61-90)	
10 Bontanga	a) Tamale (61-90) b) Nyankpala (85-94)	a) Tamale (61-90) b) Nyankpala (85-94)	a) Tamale (61-90) b) Nyankpala (85-94)	a) Tamale (61-90) b) Nyankpala (85-94)	a) Tamale (61-90) b) Nyankpala (85-94)	a) Nyankpala (85-94)
11 Subinja	a) Wenchi (61-94)	a) Wenchi (61-90)	a) Wenchi (61-90)	a) Wenchi (61-90)	a) Wenchi (61-90)	
12 Okyereko	a) Saltpond (61-94) b) Okyereko (78-95)	a) Saltpond (61-94)	a) Saltpond (61-94)	a) Saltpond (61-94)	a) Saltpond (61-94)	

Note : The figures parenthesized mean calender year.

Table A-3 Mapping Unit Description (1/3)

Project Name	Mapping Symbol	Topography	Soil Unit	Slope	Drainage Condition	color	Texture (top-sub)	Depth	others	Local Name	Area <1 (ha)
Ashaiman	U21	middle slope	Dystric Planosols	0 - 2 %	mod. well - imperfect	yellow - olive gray	SL - C	mod. deep	(terrace land), gravel layer	Minya	5.6
	U22	middle slope	Cambic Arenosols	0 - 2 %	well - mod. well	brown - yellowish red	LS - LS	deep	(terrace land)	Agozum	10.9
	U31	foot slope	Dystric Planosols	0 - 1 %	mod. well - imperfect	grayish yellow - gray	LS - SC	mod. deep	(terrace land)	Agawtaw	10.3
	U32	foot slope	Gleyic Cambisols	0 - 1 %	imperfect	grayish yellow brown	LS - SC	mod. deep	surface soil was removed out on land development.	Minya	24.6
	P1	upper plain	Dystric Vertisols	0 - 1 %	poor	black-dark gray	C - C	mod. deep		Ahaiman	49.0
	P2	lower-flat plain	Dystric Vertisols	0 %	poor - v. poor	black-dark gray	C - C	deep		Bumbi	57.7
	P2	lower-flat plain	Dystric Vertisols (salt effected)	0 %	poor - v. poor	black-dark gray	C - C	deep		Bumbi	5.9
Weija	U1	upper slope	Dystric Regosols	0 - 3 %	well - mod. well	brownish black - yellow brown	SL - SC	mod. deep	decomposing rock at 80-120 cm	Feto	38.2
	U21	middle slope	Dystric Arenosols	1 - 2 %	well - mod. well	brownish black - glayish yellow	SL - SC	deep		Hacho	12.0
	U22	middle to lower slope	Dystric Planosols	1 - 2 %	mod. well - imperfect	brownish black - glayish yellow	LS - SC	mod. deep	impermeabile layer at 70 - 100 cm	Gbegbey	47.1
	U3	lower slope to bottom	Dystric Planosols	0 - 1 %	imperfect	dark braown - dull brown	LS - SC	mod. deep	impermeabile layer at 70 - 100 cm	Gbegbey	85.1
	P21	bottom - flat	Gleyic Cambisols	1 - 2 %	imperfect - poor	brownish black - glay	CL - C	deep		Songaw	15.0
	P22	flat	Gleyic Cambisols	0 - 1 %	poor - v. poor	brownish black - glay	CL - C	deep		Songaw	34.5
Amate	H21	middle to lower slope	Ferralic Arenosols	2 - 5 %	well	dark reddish brown - reddish brown	LS - SL (SCL)	deep		Bediesi	++++
	H22	middle to lower slope	Skeletic Chromic Cambisols	2 - 5 %	well	dark brown - reddish brown	gravel , CL - gravel, C	shallow	gravel layer form 15 cm	Pimpimso	++
	H32	lower slope/lake shore	Cambic Arenosols	1 - 3 %	imperfect	grayish brown - dull brown	S (LS) - SL	deep		Bejua	+
Aveyme*1	U1	upper slope	Ferralic Arenosols	2 - 5 %	well	brown - reddish brown	S - SL	deep		Chichiware	6.9
	P1	foot slope-upper plain	Dystric Cambisols	0 - 1 %	mod. well - imperfect	yellowish brown	SL - SCL	deep		Hake	11.5
	P2	flat plain	Dystric Cambisols	0 %	imperfect - poor	yellowish brown	CL - C	deep		Amo	40.8
	P3	depressional plain	Gleyic Cambisols	0 - 1 %	poor - v. poor	dark olive - gray	C - C	deep		Amo	10.8

Table A-3 Mapping Unit Description (2/3)

Project Name	Mapping Symbol	Topography	Soil Unit	Slope	Drainage Condition	color	Texture (top-sub)	Depth	others	Local Name	Area <1 (ha)
Afife	P11	upper plain	Dystric Cambisols	0 - 1 %	imperfect-poor	brownish black - light yellow	SL - SC	deep		Glefe	72.5
	P12	upper plain	Vertic Cambisols	0 - 1 %	imperfect-poor	brownish black - yellowish gray	SCL - SC	deep		Volavi	395.4
	P2	flat plain	Dystric Vertisols	0 %	poor - v. poor	black - dark gray	C - C	deep		Oyibi	352.2
	P2*	flat plain	Dystric Vertisols (salt effected)	0 %	poor - v. poor	black - dark gray	C - C	deep		Oyibi	157.9
Kpando-Torkor*2	H2	middle - lower slope	Skeletic-Humic Cambisols	1 - 4 %	well	brownish black - yellowish brown	CL - gravel, C	shallow		Dzawa	228.8
	H31	lower slope	Humic / Vertic Cambisols	1 - 4 %	well	brownish black - reddish brown	CL - gravel, C	mod. deep	accumulation of Fe conc.	Angera	63.9
	H32	lower slope	Skeletic-Chromic Cambisols	1 - 4 %	well	brownish black - reddish brown	CL - gravel, C	mod. deep	accumulation of Fe conc.	Dzawa	7.7
	H4	bottom	Skeletic-Humic Cambisols	2 - 3 %	imperfect-poor	brownish black - glay	CL - gravel, C	mod. deep	accumulation of Fe conc. GWT at 100cm	Takrabe	31.9
	R1	levee-lower slope	Humic Cambisols, Cambic Arenosols	1 - 3 %	mod. well - imperfect	brownish black - bright brown	S (LS) - SL (SCL)	deep		Afeyi	23.1
	R2	river course	Humic Fluvisols	0 - 2 %	imperfect - poor	brownish black - dull yellowish brown brown	S - S	mod. deep	GWT at 100 cm	Kpeyi	18.5
	L1	lower slope - lake shore	Skeletic-Eutric Gleysols	0 - 2 %	v. poor	brownish black - glay	CL - gravel, C	mod. deep	GWT is high	Torkor	1.1
Mankessim	H1	ridge and higher part of slope	Skeletic-Haplic Acrisols	2 - 4 %	well	reddish brown	L - gravel & C	shallow		Swedru	32.8
	H2	middle slope	Skeletic-Haplic Acrisols	4 - 10 %	well	reddish brown	gravel & SL - gravel & SCL	shallow		Nsaba	30.9
	H3	lower slope	Skeletic-Haplic Acrisols	2 - 4 %	well	reddish brown	gravel & SL - gravel & SCL	shallow		Nsaba	20.4
	P11	old terrace	Chromic Luvisols	2 - 6 %	well - mod. well	reddish brown	SL - gravel & CL	mod. deep		Biaim	9.2
	P12	old alluvial Plain	Haplic Luvisols	1 - 2 %	imperfect	brownich black - yellowish brown	SL - SC	deep		- (Kakum)	70.7
	P21	alluvial plain	Greyic Cambisols	0 %	poor	yellowish brown - grey	O.M. - C	shallow	GWT at 30cm	Kakum	74.2
	P22	valley bottom	Eutric Greysols	0 - 1 %	v. poor	grey	O.M. - C	shallow	GWT at 30cm	Oda	30.7
Akumadan	H21	middle slope	Skeletic-Ferric Acrisols	4 - 6 %	well	reddish brown	SL (LS) - ironstone (CL)	shallow		Techiman	13.9
	H22	middle slope	Ferric Acrisols	2 - 4 %	well	reddish brown	SL (LS) - CL (ironestones)	mod. deep	accumulation of Fe conc.	Damongo	47.8
	RT		Cambic Arenosols	2 - 4 %	mod. well	yellowish brown	S - SL	deep		Tanoso	6.3

Table A-3 Mapping Unit Description (3/3)

Tanoso	H1	ridge and higher part of slope	Petroferric-Eutric Leptosols	4 - 6 %	well	brownish black - dark reddish brown	SL - ironstones (C)	shallow		Wenchi	61.1
	H21	middle slope	Skeletic-Ferric Acrisols	4 - 6 %	well	reddish brown	SL (LS) - ironstone (CL)	shallow		Techiman	10.7
	H22	middle slope	Ferric Acrisols	2 - 4 %	well	reddish brown	SL (LS) - CL (ironestones)	mod. deep		Damongo	30.0
	H3	lower slope	Ferric Acrisols	2 - 4 %	imperfect	reddish brown	SL (LS) - CL (ironstone)	mod. deep		Murugu	19.1
Bontanga	P1	upper plain - old terrace	Dystric Plinthosols	1 - 2 %	imperfect	dark brown - grayish brown	SL - ironstones (C)	mod. deep		Lima	49.2
	P2	flat plain	Gleyic Cambisols	0 %	Poor	grayish brown	SL - C	deep		Lima	342.2
	P3	depressional plain (river bottom)	Dystric Gleysols	0 %	v. poor	yellowish gray or gray	SL - SCL	mod. deep	GWT at 90-100 cm	Volta	99.6
	P4	natural levee	Stagnic-Dystric Cambisols	2 - 4 %	imperfect	dark brown - dull orange	L - CL	deep		Siru	9.1
Subinja	H1	ridge and higher part of slope	Petroferric-Eutric Leptosols	2 - 4 %	well	brownish black - dark reddish brown	SL - ironstones (C)	shallow		Wenchi	15.4
	H21	middle slope	Skeletic-Ferric Acrisols	4 - 6 %	well	reddish brown	SL (LS) - ironstone (CL)	shallow		Techiman	30.2
	H22	middle slope	Ferric Acrisols	2 - 4 %	well	reddish brown	SL (LS) - ironstone (CL)	mod. deep		Damongo	43.5
	H3	lower slope	Ferric Acrisols	2 - 4 %	mod. well - imperfect	reddish brown	LS - CL	deep		Murugu	24.1
	RT		Cambic Arenosols	2 - 4 %	mod. well	yellowish brown	S - SL	deep		Tanoso	13.8
Okyereko	T1	terrace remnant	Skeletic-Haplic Alisols	3 - 10 %	well-mod. well	brownish black - grayish yellow	SL - gravels (C)	shallow	(terrace land), gravel layer	Simpa	1.7
	T21	middle-lower slope slope	Cambic Arenosols	1 - 4 %	mod. well - imperfect	grayish brown - yelloish brown	SL - gravel & C	deep	(terrace land)	Nta	14.3
	T22	middle-lower slope slope	Haplic Alisols	2 - 6 %	mod. well	grayish brown - yelloish brown	SCL - gravel & SC	mod. deep	(terrace land)	Akroso	3.6
	P1	upper plain	Distric Cambisols	0 - 1 %	imperfect	brownish black - grayish yellow	CL - C	deep		Kakum	67.8
	P2	flat plain	Gleyic Cambisols	0 %	poor	brownish black - gray	C - C	deep		Oyibi	35.6

Remarks : <1 : The area is the gross area including roads, rivers, canals, etc.

*1 : The base map of Amate is not available, hence the area is not estimated. The dominant portion of classes are roughly estimated as follows:

++++ : 50-70%, "++" : 10-30%, "+" : 0-10%

*1 : The soil survey was carried out only about the existing developed area.

*2 : The soil survey carried out in the potential area including the out of planned area.

Table A-4 Physical and Chemical Properties of Soils

No.	Project	Location	Sample ID	Layer	Particle size			Texture	pH (H2O) (1:2.5)	EC (1:5) (uS)	Org.-C (%)	Tot -N (%)	C/N	Ava.-P (ppm)	CEC	Exchangeable Cations (me/100g)				BSP (%)	ESP (%)
					Sand	Silt	Clay									Ca	Mg	K	Na		
1	Tanoso	1	T-1	0-20	81.7	2.1	16.3	SL	5.0	11	0.73	0.08	9.1	14.6	12.3	0.91	0.27	0.15	0.12	0.12	0.01
2	Tanoso	1	T-1	20-40	66.6	3.4	30.0	SCL	4.6	28	-	-	-	-	-	-	-	-	-	-	-
3	Tanoso	1	T-1	60-80	65.0	2.5	32.5	SCL	4.4	6	-	-	-	-	-	-	-	-	-	-	-
4	Tanoso	2	T-2	0-20	74.4	2.8	22.5	SCL	6.0	21	1.09	0.1	10.9	5.0	13.2	2.11	0.95	0.24	0.03	0.25	0.00
5	Tanoso	2	T-2	40-60	45.4	9.6	45.0	SC	4.7	18	0.48	0.05	9.6	0.7	18.1	0.93	0.41	0.06	0.25	0.09	0.01
6	Tanoso	2	T-2	80-100	40.2	6.1	53.8	C	4.8	23	0.29	0.06	4.8	0.6	22.7	0.46	0.40	0.07	0.09	0.04	0.00
7	Tanoso	3	T-3	0-20	73.4	9.1	17.5	SL	7.9	117	1.37	0.11	12.5	3.4	13.2	9.31	0.90	0.21	0.20	0.81	0.02
8	Tanoso	3	T-3	40-60	52.3	7.7	40.0	SC	7.6	28	-	-	-	-	-	-	-	-	-	-	-
9	Tanoso	3	T-3	80-100	41.9	5.6	52.5	C	7.2	38	-	-	-	-	-	-	-	-	-	-	-
10	Tanoso	4	T-4	0-20	68.8	13.7	17.5	SL	6.6	34	2.07	0.17	12 2	3.7	16.4	5.05	2.05	0.61	0.04	0.47	0.00
11	Tanoso	5	T-5	0-20	64.6	12.9	22.5	SCL	5.7	64	1.88	0.13	14.5	15.4	14.7	3.23	1.15	0.14	0.04	0.31	0.00
12	Tanoso	5	T-5	40-60	43.6	15.9	40.5	C	4.9	21	1.02	0.1	10.2	1.1	22.9	0.90	0.37	0.13	0.13	0.07	0.01
13	Tanoso	5	T-5	80-100	42.5	10.0	47.5	C	5.0	3	0.56	0.06	9.3	0.7	23.8	0.30	0.10	0.08	0.03	0.02	0.00
14	Subinja	1	S-1	0-20	82.0	5.5	12.5	SL	5.8	12	0.51	0.05	10.2	3.0	10.9	1.04	0.53	0.06	0.02	0.15	0.00
15	Subinja	1	S-1	40-60	64.4	23.2	12 5	SL	4.5	25	0.34	0.04	8.5	1.5	17.0	0.40	0.14	0.05	0.02	0.04	0.00
16	Subinja	1	S-1	80-100	49.2	8.4	42.5	C	5.1	8	0.32	0.02	16.0	0.7	27.5	1.64	0.56	0.03	0.03	0.08	0.00
17	Subinja	2	S-2	0-20	n.a	n.a	n.a	n a.	5.0	5	0.53	0.05	10.6	11.7	11.2	0.40	0.12	0.04	0.21	0.07	0.02
18	Subinja	2	S-2	40-60	64.0	3.5	32.5	SCL	4.5	6	0.48	0.04	12.0	1.2	32.0	1.49	0.88	0.03	0.02	0.08	0.00
19	Subinja	3	S-3	0-20	83.8	3.7	12.5	LS	6.1	11	0.45	0.05	9.0	2.9	16.3	1.57	0.45	0.03	0.01	0.13	0.00
20	Subinja	3	S-3	40-60	60.8	6.8	32.5	SCL	5.5	12	0.45	0.03	15.0	2.5	20.0	1.59	0.48	0.06	0.03	0.11	0.00
21	Akumadan	1	AK-1	0-20	50.5	14.6	35.0	SC	5.4	21	2.17	0.13	16.7	2.0	16.0	3.08	1.40	0.12	0.03	0.29	0.00
22	Akumadan	1	AK-1	40-60	23.4	16.7	60.0	C	5.6	34	-	-	-	-	-	-	-	-	-	-	-
23	Akumadan	1	AK-1	80-100	24.3	13.2	62.5	C	5.4	33	-	-	-	-	-	-	-	-	-	-	-
24	Akumadan	2	AK-2	0-20	41.7	18.3	40.0	CL	6.9	59	1.56	0.12	13.0	4.3	27.3	6.11	1.66	0.70	0.05	0.31	0.00
25	Akumadan	2	AK-2	40-60	41.9	10.8	47.5	C	7.1	32	-	-	-	-	-	-	-	-	-	-	-
26	Akumadan	2	AK-2	80-100	26.2	13.8	60.0	C	5.4	22	-	-	-	-	-	-	-	-	-	-	-
27	Akumadan	3	AK-3	0-20	83.7	6.3	10.0	LS	5.7	46	0.45	0.08	5.6	21.1	11.3	0.83	0.15	0.08	0.03	0.10	0.00
28	Akumadan	3	AK-3	40-60	76.1	6.4	17.5	SL	6.0	12	0.27	0.03	9.0	1.9	11.8	1.00	0.55	0.05	0.02	0.14	0.00
29	Akumadan	3	AK-3	80-100	71.3	6.2	22.5	SCL	5.0	22	0.19	0.03	6.3	1.3	17.9	0.60	0.88	0.10	0.11	0.09	0.01
30	Akumadan	4	AK-4	0-20	63.4	7.8	28.8	SCL	5.9	21	0.96	0.09	10.7	12.4	14.3	3.21	0.72	0.23	0.03	0.29	0.00
31	Akumadan	4	AK-4	40-50	43.7	8.8	47.5	C	4.9	46	-	-	-	-	-	-	-	-	-	-	-
32	Akumadan	5	AK-5	0-20	66.7	5.8	27.5	SCL	5.9	32	1.09	0.08	13.6	2.2	14.3	2.49	1.10	0.19	0.03	0.27	0.00
33	Akumadan	5	AK-5	40-60	34.9	12.7	52.5	C	4.6	n.a.	-	-	-	-	-	-	-	-	-	-	-
34	Akumadan	5	AK-5	80-100	33.7	13.9	52.5	C	4.4	40	-	-	-	-	-	-	-	-	-	-	-
35	Akumadan	6	AK-6	0-20	73.4	9.1	17.5	CL	5.7	32	1.05	0.07	15.0	20.0	17.9	2.03	0.93	0.17	0.06	0.18	0.00
36	Akumadan	6	AK-6	40-60	48.8	8.7	42.5	C	4.6	25	-	-	-	-	-	-	-	-	-	-	-
37	Akumadan	6	AK-6	80-100	44.3	10.7	45.0	C	4.3	29	-	-	-	-	-	-	-	-	-	-	-
38	Bontanga	1	B-1	0-20	68.8	18.7	12.5	SL	5.3	16	0.26	0.03	8.7	3.4	37.0	0.90	0.41	0.06	0.09	0.04	0.00
39	Bontanga	1	B-1	40-60	54.2	8.3	37.5	SC	5.1	8	-	-	-	-	-	-	-	-	-	-	-
40	Bontanga	1	B-1	80-100	31.7	13.4	55.0	C	5.2	6	-	-	-	-	-	-	-	-	-	-	-
41	Bontanga	2	B-2	0-20	15.7	56.9	27.5	SiCL	5.1	22	1.09	0.08	13.6	1.3	14.7	1.54	1.08	0.06	0.25	0.20	0.02
42	Bontanga	2	B-2	40-60	6.9	45.6	47.5	SiC	5.2	25	-	-	-	-	-	-	-	-	-	-	-
43	Bontanga	2	B-2	80-100	15.2	44.8	40.0	SiC	5.2	17	-	-	-	-	-	-	-	-	-	-	-
44	Boatanga	3	B-3	0-20	77.9	9.6	12.5	SL	5.4	8	0.41	0.05	8.2	1.7	16.0	1.44	1.10	0.05	0.03	0.16	0.00
45	Bontanga	3	B-3	40-60	69.2	13.3	17.5	SL	5.5	6	-	-	-	-	-	-	-	-	-	-	-
46	Bontanga	3	B-3	60-80	39.7	12.9	47.5	C	5.8	14	-	-	-	-	-	-	-	-	-	-	-
47	Bontanga	4	B-4	0-20	73.8	13.7	12.5	SL	5.0	14	0.45	0.05	9.0	1.3	12.9	0.90	0.44	0.09	0.04	0.11	0.00
48	Bontanga	4	B-4	40-60	40.7	21.9	37.5	CL	5.4	7	1.04	0.04	26.0	0.7	20.6	2.66	2.91	0.22	0.27	0.29	0.01
49	Bontanga	4	B-4	80-100	33.2	21.8	45.0	C	6.2	20	0.16	0.03	5.3	0.5	18.4	5.55	4.65	0.28	0.49	0.60	0.03
50	Bontanga	5	B-5	0-20	44.8	25.2	30.0	CL	8.3	168	0.64	0.05	12.8	0.8	19.2	0.70	3.20	0.55	0.79	0.27	0.04
51	Bontanga	5	B-5	40-60	23.3	36.7	40.0	CL	9.1	244	-	-	-	-	-	-	-	-	-	-	-
52	Bontanga	5	B-5	80-100	23.1	37.0	40.0	CL	9.1	204	-	-	-	-	-	-	-	-	-	-	-
53	Bontanga	6	B-6	0-20	54.5	30.5	15.0	SL	6.8	54	0.64	0.08	8.0	12.1	11.6	1.54	0.95	0.42	0.17	0.27	0.01
54	Bontanga	6	B-6	40-60	41.7	25.9	32.5	CL	5.1	27	0.16	0.03	5.3	2.2	15.0	3.27	2.38	0.21	0.57	0.43	0.04
55	Bontanga	6	B-6	80-100	37.5	27.5	35.0	CL	7.6	37	0.06	0.02	3.0	1.3	20.3	5.19	3.45	0.12	0.57	0.46	0.03
56	Bontanga	7	B-7	0-20	66.1	23.9	10.0	SL	4.6	67	0.45	0.04	11.3	15.5	11.2	0.80	0.37	0.09	0.07	0.12	0.01
57	Bontanga	7	B-7	40-60	38.9	28.6	32.5	CL	5.4	10	-	-	-	-	-	-	-	-	-	-	-
58	Bontanga	7	B-7	80-100	23.0	14.6	62.5	C	5.5	9	-	-	-	-	-	-	-	-	-	-	-
59	Bontanga	8	B-8	0-20	66.8	20.8	12.5	SL	5.5	12	0.29	0.03	9.7	4.2	13.5	0.93	0.50	0.08	0.09	0.12	0.01
60	Bontanga	8	B-8	40-60	53.0	17.1	30.0	SCL	5.5	6	-	-	-	-	-	-	-	-	-	-	-
61	Bontanga	8	B-8	80-100	37.4	20.0	42.5	C	5.6	14	-	-	-	-	-	-	-	-	-	-	-
62	Bontanga	10	B-10	0-20	68.2	19.3	12.5	SL	6.6	24	0.45	0.04	11.3	2.1	12.3	2.14	1.03	0.06	0.12	0.27	0.01
63	Bontanga	10	B-10	40-60	36.5	51.0	12.5	SiL	5.9	6	-	-	-	-	-	-	-	-	-	-	-
64	Bontanga	10	B-10	80-100	25.2	19.9	55.0	C	6.4	15	-	-	-	-	-	-	-	-	-	-	-
65	Bontanga	11	B-11	0-20	59.7	20.3	20.0	SL	5.5	16	0.73	0.07	10.4	1.6	13.2	1.96	1.13	0.12	0.20	0.26	0.02
66	Bontanga	11	B-11	40-60	48.1	24.4	27.5	SCL	6.6	84	0.38	0.04	9.5	1.5	15.6	2.46	1.72	0.07	0.27	0.29	0.02
67	Bontanga	11	B-11	80-100	58.0	22.0	20.0	SL	5.5	6	0.26	0.04	6.5	1.0	17.0	0.60	1.03	0.05	0.07	0.10	0.00
68	Bontanga	12	B-12	0-20	60.1	27.4	12.5	SL	5.4	7	0.41	0.04	10.3	1.5	23.3	1.07	0.41	0.03	0.05	0.07	0.00
69	Bontanga	12	B-12	40-60	55.6	20.6	23.8	SCL	5.1	4	-	-	-	-	-	-	-	-	-	-	-
70	Bontanga	13	B-13	0-20	49.4	25.6	25.0	SCL	7.2	36	0.54	0.04	13.5	2.7	15.7	4.67	2.43	0.13	0.04	0.46	0.00
71	Bontanga	13	B-13	40-60	48.1	24.4	27.5	SCL	6.1	6	0.26	0.03	8.7	1.1	15.8	1.86	1.83	0.09	0.07	0.24	0.00
72	Bontanga	13	B-13	80-100	37.9	24.7	37.5	CL	6.1	11	0.24	0.02	12.0	1.0	25.0	2.70	3.28	0.19	0.10	0.25	0.00
73	Bontanga	14	B-14	0-20	62.1	22.9	15.0	SL	6.4	38	0.89	0.07	12.7	3.3	20.2	2.51	1.46	0.13	0.09	0.21	0.00
74	Bontanga	14	B-14	40-60	50.9	24.1	25.0	SCL	5.6	3	-	-	-	-	-	-	-	-	-	-	-
75	Bontanga	14	B-14	80-100	35.8	16.8	47.5	C	5.7	6	-	-	-	-	-	-	-	-	-	-	-
76	Bontanga	15	B-15	0-20	64.2	18.3	17.5	SL	5.4	18	0.99	0.07	14.1	2.7	12.0	1.22	0.68	0.21	0.09	0.18	0.01
77	Bontanga	15	B-15	40-60	7.5	45.0	47.5	SiC	4.9	8	-	-	-	-	-	-	-	-	-	-	-
78	Bontanga	16	B-16	0-20	46.3	38.7	25.0	L	7.2	98	0.7	0.07	10.0	3.2	20.0	5.58	2.11	0.26	0.23	0.41	0.01
79	Bontanga	16	B-16	40-60	35.7	31.8	32.5	CL	8.1	89	-	-	-	-	-	-	-	-	-	-	-
80	Bontanga	16	B-16	80-100	28.7	33.8	37.5	CL	8.2	103	-	-	-	-	-	-	-	-	-	-	-
81	Bontanga	17	B-17	0-20	27.6	42.4	30.0	CL	5.3	26	0.89	0.07	12.7	1.1	17.0	2.42	1.44	0.14	0.14	0.24	0.01
82	Bontanga	18	B-18	0-20	66.8	18.2	15.0	SL	6.5	5	0.64	0.06	10.7	3.8	20.6	2.81	1.01	0.12	0 11	0.20	0.01
83	Bontanga	18	B-18	40-60	57.8	24.7	17.5	SL	5.6	12	-	-	-	-	-	-	-	-	-	-	-
84	Bontanga	18	B-18	80-100	43 5	19.0	37.5	CL	5.6	4	-	-	-	-	-	-	-	-	-	-	-

Table A-5 Result of Land Evaluation

Project	Map Unit	Soil Unit	Specific Criteria for Paddy				Suitability Class	Specific Criteria for Paddy				Suitability Class	Area <1 (ha)
			soil	topo.	drainage	flood		soil	topo.	drainage	flood		
Ashaiman	U21	Dytric Planosols	3	1	1	1	SR3s	2	1	1	1	S2s	5.6
	U22	Cambic Arenosols	3	1	3	1	SR3sd	2	1	1	1	S2s	10.9
	U31	Dytric Planosols	2	1	1	1	SR2s	2	1	2	1	S2sd	10.3
	U32	Gleyic Cambisols	2	1	1	1	SR2s	2	1	2	1	S2sd	24.6
	P1	Dystric Vertisols	2	1	2	1	SR2sd	3	1	3	1	S3sd	49.0
	P2	Dystric Vertisols	2	1	2	1	SR2sd	3	1	3	1	S3sd	57.7
	P2*	Dystric Vertisols	4	1	2	1	SR4s	N1	1	3	1	NS1	5.9
Weija	U1	Dystric Regosols	3	N1	3	1	NSR1	3	2	2	1	S3s	38.2
	U21	Dystric Arenosols	3	3	3	1	SR3std	3	1	2	1	S3s	12.0
	U22	Dystric Planosols	3	3	2	1	SR3sd	2	1	2	1	S2sd	47.1
	U3	Dystric Arenosols	3	2	3	1	SR3sd	2	1	2	1	S2sd	85.1
	P21	Gleyic Cambisols	1	1	1	1	SR1	2	1	3	1	S3d	15.0
	P22	Gleyic Cambisols	1	1	2	1	SR2d	2	1	3	1	S3d	34.5
Amate *1	H21	Ferric Arenosols	-	-	-	-	-	2	2	1	1	S2st	++++
	H22	Skeletic-Chromic Cambisols	-	-	-	-	-	4	3	1	1	S4s	++
	H32	Cambic Arenosols	-	-	-	-	-	3	2	2	1	S3a	+
Afife	P11	Dystric Cambisols	3	1	1	1	SR3s	1	1	2	1	S2d	72.5
	P12	Vertic Cambisols	1	1	1	1	SR1	2	1	2	1	S2sd	395.4
	P2	Dystric Vertisols	2	1	2	1	SR2sd	3	1	3	1	S3sd	352.2
	P2*	Dystric Vertisols	4	1	2	1	SR4s	N1	1	3	1	NS1	157.9
Aveyme *2	U1	Ferric Arenosols	3	N1	3	1	NSR1	3	2	1	1	S3s	6.9
	P1	Dystric Cambisols	3	1	2	1	SR3s	1	1	2	1	S2d	11.5
	P2	Dystric Cambisols	1	1	1	1	SR1	2	1	3	1	S3d	40.8
	P3	Gleyic Cambisols	1	1	2	1	SR2d	2	1	3	1	S3d	10.8
Kpando-torkor *3	H2	Skeletic-Humic Cabisols	-	-	-	-	-	4	2	1	1	S4s	228.8
	H31	Humic / Vertic Cambisols	-	-	-	-	-	3	2	1	1	S3s	63.9
	H32	Skeletic-Chromic Cambisols	-	-	-	-	-	4	2	1	1	S4s	7.7
	H4	Skeletic-Humic Cabisols	-	-	-	-	-	4	2	1	1	S4s	31.9
	R1	Humic Cambisols, Cambic Arenosols	-	-	-	-	-	3	2	2	1	S3s	23.1
	R2	Humic Fluvisols	-	-	-	-	-	3	2	2	3	S3sf	18.5
	L1	Skeletic Eutric Gleysols	-	-	-	-	-	3	1	3	3	S3sdf	1.1
Mankessim	H1	Skeletic-Haplic Acrisols	N2	N1	3	1	NSR2	4	3	1	1	S4s	32.8
	H2	Skeletic-Haplic Acrisols	N2	N2	3	1	NSR2	4	N2	1	1	NS2	30.9
	H3	Skeletic-Haplic Acrisols	N2	N1	3	1	NSR2	4	2	1	1	S4s	20.4
	P11	Chromic Luvisols	3	N1	3	1	NSR1	2	2	1	1	S2st	9.2
	P12	Haplic Luvisols	1	2	1	1	SR2t	1	1	2	1	S2d	70.7
	P21	Greyic Cambisols	1	1	3	4	SR4f	2	1	3	4	S4f	74.2
	P22	Eutric Greysols	1	1	3	4	SR4f	3	1	4	S4f	S4fd	30.7
Akumadan	H21	Skeletic-Ferric Acrisols	-	-	-	-	-	4	3	1	1	S4st	13.9
	H22	Ferric Acrisols	-	-	-	-	-	2	2	1	1	S2st	47.8
	RT	Cambic Arenosols	-	-	-	-	-	3	2	1	1	S3s	6.3
Tanoso	H1	Pettroferric-Eutric Leptisols	-	-	-	-	-	N1	3	1	1	NS1	61.1
	H21	Skeletic-Ferric Acrisols	-	-	-	-	-	4	3	1	1	S4st	10.7
	H22	Ferric Acrisols	-	-	-	-	-	3	2	1	1	S3s	30.0
	H3	Ferric Acrisols	-	-	-	-	-	2	2	2	1	S2std	19.1
Bontanga	P1	Dystric Plinthosols	3	3	1	1	SR3st	2	1	2	1	S2sd	49.2
	P2	Gleyic Cambisols	1	1	2	1	SR2d	1	1	3	1	S3d	342.2
	P3	Dystric Gleysols	1	1	3	1	SR3d	1	1	3	1	S3d	99.6
	P4	Stagnic-Dystric Cambisols	1	3	2	1	SR3t	1	2	2	1	S2td	9.1
Subinja	H1	Pettroferric-Eutric Leptisols	N2	N1	3	1	NR2	N1	2	1	1	NS1	15.4
	H21	Skeletic-Ferric Acrisols	N2	N2	3	1	NR2	4	3	1	1	S4s	30.2
	H22	Ferric Acrisols	3	N1	3	1	NR2	2	2	1	1	S2st	43.5
	H3	Ferric Acrisols	3	3	2	1	SR3st	2	2	2	1	S2std	24.1
	RT	Cambic Arenosols	3	3	3	1	SR3std	3	2	1	1	S3s	13.8
Okyereko	T1	Skeletic-Ferric Alisols	N1	1	3	1	NSR1	3	1	1	1	S3s	1.7
	T21	Cambic Arenosols	3	1	2	1	SR3s	2	1	2	1	S2sd	14.3
	T22	Haplic Alisols	2	1	2	1	SR2t	2	1	1	1	S2s	3.6
	P1	Dystric Cambisols	1	1	1	1	SR1	2	1	2	1	S2sd	67.8
	P2	Gleyic Cambisols	1	1	2	1	SR2d	3	1	3	1	S3sd	35.6

Remarks : <1 : The area is the gross area including roads, rivers, canals, etc.

*1 : The base map of Amate is not available, hence the area is not estimated. The dominant portion of classes are roughly estimated as follows:

++++ : 50-70%, "++" : 10-30%, "+" : 0-10%

*2 : The soil survey was carried out only about the existing developed area.

*3 : The soil survey carried out in the potential area including the out of planned area.

Table A-6 Present Rotation System in the Projects

Project	Field condition	Rotation system
1 Ashaiman	Lowland field	1 Rice (ws) --- Rice (ws) 2 Rice (ws) --- Okra (ds) --- Rice (ws) 3 Okra (ds) --- Okra (ds)
2 Weija	Lowland field	Continuous planting of paddy rice all year around
	Upland field	Continuous planting of vegetables all year alround ; no definate rotation pattern
3 Amate	Upland field	Tomato(ds) --- no crop (ds) --- Onion (ds) --- no crop (ds) -- Tomato (ds)
4 Afife	Lowland field	Rice --- Rice (fields are asigned alternatively in dry and wet season)
5 Aveyime	Lowland field	Rice --- Rice (fields are asigned alternatively in dry and wet season)
6 Kpando	Upland field	Okra (ds) --- no crop (ds) --- no crop (ds) --- no crop (ds) -- Okra (ds)
7 Mankassim	Upland field	1. Watermelon (ds) --- Sweet poteto (or Maize) (ws) --- Watermelon (ds) Egg pland and okra are planted as intercrops of watermelon in every dry season. Sweet poteto is planted in wet season without irrigation and fertilization.
8 Akumadan	Upland field	1. Tomato (ds) --- Maize & Cowpea (ws) --- Tomato (ds) 2. Egg plant & Peper (ds) --- Cassava (10-12 month) ---Egg plant & Peper (ds) Egg plant and pepper are planted after harvesting cassava. Cassava will planted by stem-cutting as intercrop of egg plant and pepper
9 Tanoso	Upland field	Tomato (ds) --- Maize & Cowpea (ws) --- Tomato (ds)
10 Bontanga	Lowland field	1. Rice (ds) --- Rice (ds) --- Rice (ds) 2. Okra (ds) --- Rice (ws) --- Okra (ds)
	Upland field	Tomato (ds) --- Maize (ws) --- Onion (ds) ---Tomato (ds)
11 Subinja	Upland field	Egg plant, Okra, Pepper (ds) --- Maize and Cowpea (ws) --- Egg plant, Okra, Pepper (ds)
12 Okyereko	Lowland field	Rice (ds) --- Rice (ds)

Source : Interview to the project manager, agronomist and extension officer in charge of agronomy at each project site

Table A-7 Present Average Cropping Area and Average Yield in the Projects (1/2)

Project	Crop	Average crop area (ha, %)		Average crop yield (t/ha)	
		ds	ws	ds	ws
1 Ashaiman (130ha)	Okra	19.30 (14.8%)		6.00	
	Paddy rice		39.70 (30.5%)		3.70
	Total	19.30 (14.8%)	39.70 (30.5%)		
		ds & ws		ds & ws	
2 Weija (220ha x 2 = 440ha)	Paddy rice	62.50	(14.2%)	3.70	
	Maize	13.00	(3.0%)	1.39	
	Tomato	19.60	(4.5%)	7.35	
	Hott pepper	27.90	(6.3%)	0.80	*1
	Okra	53.50	(12.2%)	9.16	
	Long marrow	6.80	(1.5%)	25.00	
	Round marrow	20.70	(4.7%)	25.68	
	Tinda	43.90	(10.0%)	14.57	
	Cluster bean	26.80	(6.1%)	6.15	
	Sweet poteto	11.40	(2.6%)	16.44	
	Other crops	37.20	(8.5%)		
	Total	323.30	(73.5%)		
		Average area (ha, %)		Average crop yield (t/ha)	
		ds	ws	ds	ws
3 Amate (101ha)	Tomato	41.20 (40.8%)		5.85	
	Onion		40.00 (39.6%)		8.50
	Pepper		4.00 (4.0%)		
	Total	41.20 (40.8%)	44.00 (43.6%)		
4 Afife (880ha)	Paddy rice	238.70 (27.1%)		3.10	
	Paddy rice		415.90 (47.3%)		4.70
	Other crops		40.00 (4.5%)		
	Total	238.70 (27.1%)	455.90 (51.8%)		
5 Aveyime (63ha)	Paddy rice	29.90 (47.5%)		2.55	
	Paddy rice		33.10 (52.5%)		4.08
	Total	29.90 (47.5%)	33.10 (52.5%)		
6 Kpando (40ha)	Okra	13.00 (32.5%)		10.00	
	Total	13.00 (32.5%)	0.00 (0.0%)		
7 Mankessim (17ha)	Watermelon	12.10 (71.2%)		7.67	
	Egg plant	10.80 (63.5%)		12.83	
	Okra	3.50 (20.6%)		4.83	
	Sweet poteto		5.20 (30.6%)		10.00
	Total	26.40 (155.3%)	5.20 (30.6%)		

*1 Dry

Table A-7 Present Average Cropping Area and Average Yield in the Projects (2/2)

Project	Crop	Average area (ha, %)				Average crop yield (t/ha)	
		ds		ws		ds	ws
8 Akumadan	Tomato	50.20	(77.2%)			4.23	
(65ha)	Maize	10.00	(15.4%)			1.50	
	Cowpea	2.50	(3.8%)			1.75	
	Groundnut	1.30	(2.0%)				
	Other crops	1.50	(2.3%)				
	Tomato			0.80	(1.2%)		1.95
	Maize			30.00	(46.2%)		1.88
	Cowpea			7.80	(12.0%)		1.63
	Pepper			4.00	(6.2%)		
	Groundnut			2.00	(3.1%)		
	Total	65.50	(100.8%)	44.60	(68.6%)		
9 Tanoso	Tomato	46.40	(72.5%)			7.04	
(64ha)	Other crops	1.40	(2.2%)				
	Maize			18.20	(28.4%)		2.14
	Other crops			11.30	(17.7%)		
	Total	47.80	(74.7%)	29.50	(46.1%)		
10 Bontanga	Paddy rice	139.40	(31.0%)			5.43	
(450ha)	Tomato	55.40	(12.3%)			16.02	
	Okra	99.60	(22.1%)			9.42	
	Egg plant	13.70	(3.0%)			9.49	
	Onion	16.60	(3.7%)			14.50	
	Other crops	16.40	(3.6%)				
	Paddy rice			116.50	(25.9%)		5.48
	Other crops			3.50	(0.8%)		
	Total	341.10	(75.8%)	120.00	(26.7%)		
11 Subinja	Egg plant	5.30	(8.8%)			11.30	
(60ha)	Pepper	5.30	(8.8%)			0.80	*1
	Maize	10.00	(16.7%)			2.00	
	Cowpea	5.70	(9.5%)			1.20	
	Other crops	2.00	(3.3%)				
	Maize			16.30	(27.2%)		1.90
	Cowpea			7.80	(13.0%)		0.98
	Other crops			0.10	(0.2%)		
	Total	28.30	(47.2%)	24.20	(40.3%)		
12 Okyereko	Paddy rice	21.60	(54.0%)			3.75	
(40ha)	Total	21.60	(54.0%)	0.00	(0.0%)		

*1 Dry

Source: Data obtained from the PM Offices and the Farm Interview Survey carried out by the Survey Team (Nov.-Dec. 1995).

Table A-8 Present Conditions of the Projects (1/4)

Description	Ashaiman	Weija	Amate
1 Administration			
(1) Region	Greater Accra	Greater Accra	Eastern
(2) District	Tema	Ga	Mpraesa
2 Planned command area*	148 ha	220 ha	203 ha
3 Actually developped area*	130 ha	220 ha	101 ha
4 Area to be expanded	18 ha	No.	102 ha
5 Construction activities			
(1) Commencement	1966	1979	1976
(2) Completion	1968	1982	1980
6 Water source	Ashaiman reservoir	Weija reservoir	Volta lake
7 Intake method	Butterfly valve	Pumps	Pumps
8 Irrigation and drainage facilities (Details are given in ATTCHMENT-2)	Dam (5.8 million m3) Main canal (unlined, L=4.8 km) Laterals (unlined, L=11.0 km) Main drain (unlined, L=3.0 km) Lateral drains (unlined. L=6.0 km) Structures (577 nos.)	Dam (116 million m3) Main canal (Lined, L=5.7 km) Main pipeline (L=9.0 km) Lateral pipeline (L=13.5 km) 1200 Sprinkler system Main drain (unlined, L=5.0 km) Lateral drain (unlined, L=5.0 km)	- 2 Movable centrifugal pumps Main pipeline (L=0.5 km) Lateral pipeline (L=0.5 km) 125 Sprinkler system
9 Project organization	Site officer (1 no.) Extension officer (1 no.) Gate operator (1 no.) Watchman (1 no.)	Project manager (1 no.) Electrician (1 no.) Mechanic (2 nos.) Pump attendant (1 no.) Agronomist (1 no.) Production officer (2 nos.) Account (1 no.) Driver (1 no.) Watchman (4 nos.)	Project manager (1 no.) Pump attendant (1 no.) Watchman (1no.)
10 Irrigation period	April to December	Yearround	Mid. June to August and November to January
11 Water distribution method	10.5 hrs. per day and Continuouse supply	8 hrs. per day and 4 to 5 days rotation	7 hrs.per day and 7 days rotation including one rest day
12 Irrigated crops	Paddy, Okra, Tomato	Okra, Tinda, Gardenegg, Hotpepper	Tomato, okra
13 Major problems on irrigation drainage	(a) Deterioration of canals and structures. (b) Water shortage. (c) Much sediment and grasses in drains. (d) Concentration of salinity in parts of the project area. (e) Lack of rice mill, dry yard and storage facilities. (f) Insufficient space of of O & M office. (g) No vehicle for O & M.	(a) Deterioration of pumps and sprinkler system. (b) No water management manual. (c) No O & M manual. (d) No definite irrigation schedule based on cropping pattern and water requirement. (e) No water supply record. (f) Much weeds and sediments in drains. (g) Water stagnant in downstream area.	(a) Deterioration of pumps and sprinkler system. (b) No water management manual. (c) No O & M manual. (d) No definite irrigation schedule based on cropping pattern and water requirement. (e) No water supply record. (f) Insufficient number of O & M staff. (g) Very bad transportation. (h) No motorcycle for O & M . (i) Deteriortion of tractor for carring movable pumps.

Table A-8 Present Conditions of the Projects (2/4)

Description	Afife	Aveyime	Kpando-Torkor
1 Administration			
(1) Region	Volta	Volta	Volta
(2) District	Ketu	Tongu	Kpando
2 Planned command area*	880 ha	150 ha	356 ha
3 Actually developped area*	880 ha	63 ha	40 ha
4 Area to be expanded	No.	87 ha	316 ha
5 Construction activities			
(1) Commencement	1962	1962	Not available
(2) Completion	1983	1975	1976
6 Water source	Agali and Kplikpa rivers	Volta river	Volta lake
7 Intake method	Dam and intake	Pumps	Pumps
8 Irrigation and drainage facilities (Details are given in ATTACHMENT-2	Dam (29 million m3) Main canal (lined, L=9.3 km) Lateral (lined, L=12.0 km) S/lateral (unlined, L= 18 km) Main drain (unlined, L=8.0 km) Lateral drains (unlined, L= 15.0 km) Structures (131 nos.)	Main canal (concrete, L=0.4 km) Lateral canals (concrete, L=3.0 km) Main drain (unlined, L= 1.0 km) Lateral drains (unlined, L= 3.0 km) Structures (43 nos.)	2 movable centrifugal pumps Main pipeline (L=0.6 km) Lateral pipeline (L= 0.2 km) 60 sprinkler system 30 rain guns
9 Project organization	Project manager (1 no.) Agri. extension worker (5 nos.) Administration (1 no.) Account officer (1 no.) Maintenance manager (1 no.) Gate keeper (3 nos.) Store keeper (1 no.) Watchman (4 nos.) Driver (2 nos.) Part timer cleaner (1 no.)	Project manager (1 no.) Agri. extension worker (1 no.) Agronomist (1 no.) Mechanics (1 no.) Watchman (2 nos.) Cleaner (1 no.)	Project manager (1 no.) Pump attendant (1 no.) Watchman (1no.)
10 Irrigation period	March to January	April to July	November to January
11 Water distribution method	The command area is divided into 11 sections, and 3 sections among them are irrigated for 3 to 4 days.	8 hrs from 7:00 to 15:00 per day and 10 days interval	6 hrs. per day and 2 to 3 days rotation
12 Irrigated crops	Paddy	Paddy	Okra
13 Major problems on irrigation drainage	(a) Lakage of canals. (b) No measuring device. (c) Much weeds in canals. (d) Much weeds and sediments in drains. (e) Water stagnant in dowmstream area.	(a) Deterioration of pumps (b) Leakage of canals (c) No measuring device (d) Much grasses and sediments in drains. (e) No water supply record.	(a) Deterioration of pumps and sprinkler system. (b) No water management manual. (c) No O & M manual. (d) No definite irrigation schedule based on cropping pattern and water requirement. (e) No water supply record. (f) Insufficient number of O & M staff. (g) Poor O & M office. (h) No vehicle/motor cycle for O & M. (i) Deteriortion of tractor for carring movable pumps.

Table A-8 Present Conditions of the Projects (3/4)

Description	Mankessim	Akumadan	Tanoso
1 Administration			
(1) Region	Central	Ashanti	Brong Ahafo
(2) District	Mfantsiman	Offinso	Techiman
2 Planned command area*	256 ha	65 ha	115 ha
3 Actually developped area*	17 ha	65 ha	64 ha
4 Area to be expanded	239 ha	No.	51 ha
5 Construction activities			
(1) Commencement	1974	1974	1974
(2) Completion	1981	1976	1984
6 Water source	Apropong reservoir	Atwetwe river	Tano river
7 Intake method	Intake valve and pumps	Weir aand pumps	Weir and pumps
8 Irrigation and drainage facilities (Details are given in ATTACHMENT-2	Dam (5.7 million m3) Intake gate/valve 2 pumps Main pipeline (L = 0.9 km) Lareral pipeline (L = 0.4 km) 45 sprinkler system	Concrete weir 3 Centrifugal pumps Main pipeline (L = 3.1 km) Lateral pipeline (L =1.2 km) 32 sprinkler system	Concrete weir 4 Centrifugal pumps Main pipeline (L = 2.0 km) Lateral pipeline (L =0.5 km) 72 sprinkler system
9 Project organization	Project manager (1 no.) Topo-surveyor (1 no) Driver/Mechanic (1 no) Pump Attendant (1 no) Watchman (1 no)	Project manager (1 no.) Production officr (1 no.) Agri. extension worker (1 no.) Mechanic (1 no.) Watchman (2 nos.)	Project manager (1 no.) Production officr (1 no.) Watchman (1no.) Pump attendant (1 no.)
10 Irrigation period	December to April	December to March	December to March
11 Water distribution method	6 hrs. per day for 3.4 ha and 5 days rotation	8 hrs. per day/6 ha and 5 days rotation	12 hrs.per day/12 ha and 7 days rotation
12 Irrigated crops	Okra, watermelon, garden egg	Tomato, maize, cowpea	Tomato, okra,maize
13 Major problems on irrigation drainage	(a) Deterioration of pumps and sprinkler system. (b) Severe innundation by flood every year. (c) No water management manual. (d) No O & M manual. (e) No definite irrigation schedule based on cropping pattern and water requirement. (f) No water supply record. (g) Deterioration of O & M office. (h) Damage of bridge for spillway. (i) Much grasses in spillway drain.	(a) No bridge at weir site in spite of both side intake. (b) Deterioration of pumps and sprinkler system. (c) Lack of pump station. (d) No water management manual. (e) No O & M manual. (f) No definite irrigation schedule based on cropping pattern and water requirement. (g) No water supply record. (h) Insufficient number of O & M staff. (i) Lack of O & M office. (j) No vehicle for O & M.	(a) Much water letus in resevoir. (b) Deterioration of pumps and sprinkler system. (c) No water management manual. (d) No O & M manual. (e) No definite irrigation schedule based on cropping pattern and water requirement. (f) No water supply record. (g) Insufficient number of O & M staff. (h) Deterioration of O & M office. (i) No vehicle for O & M.

Table A-8 Present Conditions of the Projects (4/4)

Description	Bontanga	Subinja	Okyereko
1 Administration			
(1) Region	Northern	Brong Ahafo	Central
(2) District	Tolong-Kumbangu	Wench	Gomoa
2 Planned command area*	450 ha	121 ha	111 ha
3 Actually developped area*	450 ha	60 ha	40 ha
4 Area to be expanded	No.	61 ha	71 ha
5 Construction activities			
(1) Commencement	1980	1974	1976
(2) Completion	1987	1976	1988
6 Water source	Bontanga river	Subin river	Okyereko reservoir
7 Intake method	Dam and intakes	Weir and pumps	Intake valve
8 Irrigation and drainage facilities (Details are given in ATTACHMENT-2	Dam (25 million m3) Main canals (concrete,L=12.2 km) Lateral (concrete, L= 19.0 km) Main drain (unlined, L=4.0 km) Lateral drains (unlined, L= 14.0 km) Structures (826 nos.)	Concrete weir 3 Centrifugal pumps Main pipeline (L = 2.0 km) Lateral pipeline (L =0.7 km) 45 Sprinkler system	Dam (2.71 million m3) Main canal (lined,L=1.3 km) Laterals and sub-laterals (L=2.8 km) Main drain (unlined, L=2.0 km) Lateral drain (unlined, L=2.0 km) Structures (74 nos.)
9 Project organization	Project manager (1 no.) Agri. extension worker (4 nos.) Administration (1 no.) Accountant (1 no.) Store keeper (1 no.) Drivers (2nos.) Watchman (3 nos.) Maintenance man (2 nos.)	Project manager (1 no.) Watchman (1no.) Production officer (1 no.) Pump attendant (1 no.)	Project manager (1 no.) Gate operator (1no.)
10 Irrigation period	December to March	December to March	September to January
11 Water distribution method	Twice a week for paddy Twice a day for onion Once a week for other vegetables	9 hrs. per day/12 acres and 7 days rotation	12 hrs. for 2 laterals 10 days rotation
12 Irrigated crops	Paddy, okra, onion, tomato	Tomato, okra, maize	Paddy
13 Major problems on irrigation drainage	(a) Leakage of intake gates. (b) No staff gauge at parshall flume (c) Much grasses in drains. (d) Backwater effect. (e) No water management manual. (f) No O & M manual. (g) No operation rule of dam. (h) No definite irrigation schedule based on cropping pattern and water requirement. (i) No water supply record.	(a) Weir is damaged. (b) Deterioration of pumps and sprinkler system. (c) Pump station is a few times inundated by flood in a year. (d) No water management manual. (e) No O & M manual. (f) No definite irrigation schedule based on cropping pattern and water requirement. (g) No water supply record. (h) Insufficient number of O & M staff. (i) Deterioration of O & M office. (j) No vehicle for O & M.	(a) Deterioration of canals and structures. (b) Water shortage. (c) Much sediment and grasses in drains. (d) Concentration of salinity in parts of the project area. (e) No water management manual. (f) No O & M manual. (g) No definite irrigation schedule based on cropping pattern and water requirement. (h) Insufficient number of O & M staff. (i) Deterioration of O & M office. (j) No vehicle for O & M.

Table A-9 Water Distribution Method for the Projects

Project	Developed Area*	Irrigation Method	Irrigation Period	Irrigated Crops	Irrigation Schedule	Water Distribution Method
1 Ashaiman	130 ha	Gravity	Apr. to Dec.	Paddy, Okra Tomato	Yes	Daily irrigation time : 10.5 hours Continuous water supply method is applied.
2 Weija	220 ha	Sprinkler	Yearround	Okra,Tinda Gardenegg	No	Daily irrigation time : 8 hours. One time irrigation : 2 to 3 hours Irrigation interval : 4 to 5 days.
3 Amate	101 ha	Sprinkler	Mid.Jun. to Aug. Nov. to Jan.	Okra, Tomato	No	Daily irrigation time : 6 to 8 hours. One time irrigation : 40 minutes Irrigation interval : 7 days including rest day.
4 Afife	880 ha	Gravity	Mar. to Jan.	Paddy, Okra	No	Project area is divided into11 Sections. Out of them, 3 sections are irrigated for 3 to 4 days at one time.
5 Aveyime	63 ha	Gravity	Apr. to Jul.	Paddy	No	Daily irrigation time : 8 hours for 8 acres (3.2 ha) Irrigation interval : 10 days normally.
6 Kpando-Torkor	40 ha	Sprinkler	Nov. to Jan.	Okra	No	Daily irrigation time : 6 hours Irrigation interval : 2 to 3 days.
7 Mankessim	17 ha	Sprinkler	Dec. to Apr.	Okra, Gardenegg Watermelon	No	Daily irrigation time : 6 hours Irrigation interval : 5 days.
8 Akumadan	65 ha	Sprinkler	Dec. to Mar.	Tomato	No	Daily irrigation time : 8 hours for 2 to 3 ha Irrigation interval : 5 days.
9 Tanoso	64 ha	Sprinkler	Dec. to Mar.	Okra, Tomato	No	Daily irrigation time : 12 hours for 6 ha Irrigation interval : 6 days.
10 Bontanga	450 ha	Gravity	Dec. to Mar.	Paddy, Oninon Vegetables	No	Daily irrigation time : 60% gate opening throughout irrigation time. Irrigation interval : Twice a week for paddy, once a week for vegetables twice a day for onion.
11 Subinja	60 ha	Sprinkler	Dec. to Mar.	Okra, Tomato	No	Daily irrigation time : 8 hours for 5 acres (2 ha) Irrigation interval : 6 days.
12 Okyereko	40 ha	Gravity	Sept. to Jan.	Paddy	No	Daily irrigation time : 12 hours for 2 laterals Irrigation interval : 10 days.

* : Preliminarily estimated so that further check willbe made in the next stage.

Table A-10 Inventory Survey Results of Project Facility (1/12)

Project name : 1.Asbaiman
Constructed year : 1968
Developed area 130 ha
Irrigated area : 59 ha
Irrigation type : Gravity

Facilities	Number or Quantity		Existng Condition	Description	Judgment
1 Dam					
(1) Embankment			Good		
- Total capacity	5.8	MCM			
- Effective capacity	5.2	MCM			
- Crest length	700	m			
- Crest height	11.9	m			
(2) Spillway	1	nos	Good		
- Design discharge	84.95	m3/s			
2 Weir	-	nos		Not applied	
3 Intake					
(1) Gate	-	nos			
(2) Valve	2	nos	Moderate	Right bank canal,Left bank canal	Rehabilitation
- Design discharge	0.28	m3/s		Same capacity for both canal.	
(3) Pump	-	nos		Not applied	
- Set up year	-				
- Out put	-	m3/hr			
- Total head	-	m			
- Type	-				
4 Irrigation system					
(1) Canal					
(a) Main	4.8	km	Poor	R.canal =3.4km,L.canal =1.4km	Rehabilitation
(b) Lateral	11	km	Poor		Rehabilitation
(2) Pipeline system				Not applied	
(a) Main	-	km			
(b) Lateral	-	km			
(c) Sprinkler	-	nos			
5 Drainage system					
(1) Drainage canal					
(a) Main	3	km	Poor	Weeds	Rehabilitation
(b) Lateral	6	km	Poor	Weeds	Rehabilitation
(c) Intercept	-	km		Not applied	
(d) Spillway canal	-	km		Not applied	
6 Related structure					
(1) Farm pond	-	nos		Not applied	
(2) Turnout					
(a) Main	26	nos	Poor		Rehabilitation
(b) Lateral	260	nos	Poor		Rehabilitation
(3) Check					
(a) Main	26	nos	Poor		Rehabilitation
(b) Lateral	-	nos		Not applied	
(4) Syphon					
(a) Main	1	no			
(b) Lateral	-	nos		Not applied	
(5) Aqueduct	-	nos		Not applied	
(6) Drop					
(a) Main	-	nos		Not applied	
(b) Lateral	260	nos	Poor		Rehabilitation
(7) Spillway	-	nos		Not applied	
(8) Wasteway	-	nos		Not applied	
(9) Impact box	-	nos		Not applied	
(10) Measuring device	-	nos		Not applied	
(11) Bridge	-	nos		Not applied	
(12) Irrigation crossing	4	nos	Poor		Rehabilitation
(13) Drainage culvert	-	nos		Not applied	
(14) Drainage gate	-	nos		Not applied	
7 Farm road	16	km	Poor		Rehabilitation
8 Project building					
(1) Pump house	-	nos		Not applied	
(2) Office	6	nos	Good		
(3) Store	1	no	Good		
(4) Garage	1	no	Good		
(5) Dry yard	1	no	Good		
(6) Souter house	-	nos		Not applied	
9 Others					
Drainage culvert under High way out of project area	4	nos	Good	Drain from Asaiman town shall be improved.	

Table A-10 Inventory Survey Results of Project Facility (2/12)

Project name : 2.Weija
Constructed year : 1982

Developed area 220 ha
Irrigated area : 323 ha
Irrigation type : Pump + Sprinkler

Facilities	Number or Quantity		Existng Condition	Description	Judgment
1 Dam				Weija dam is controlled by GWSC.	
(1) Embankment			Good		
- Total capacity	116	MCM			
- Effective capacity		MCM			
- Crest length		m			
- Crest height	16	m			
(2) Spillway	1	no	Good		
- Design discharge		m3/s			
2 Weir	-	nos		Not applied	
3 Intake					
(1) Gate	-	nos		Not applied	
(2) Valve	-	nos		Not applied	
(3) Pump					
(a) Intake pump	2	nos	Poor	One is not used due to operation panel damage.	Renew
- Set up year	1983				
- Out put	1200	m3/hr			
- Total head	24	m			
- Type	Inclined axial				
(b) Booster pump	4	nos	Poor	2 pumps are unserviceable	Renew
- Set up year	1983				
- Out put	410	m3/hr			
- Total head	66	m			
- Type	Vertical axial				
4 Irrigation system					
(1) Canal					
(a) Main	5.7	km	Good		
(b) Lateral	-	km		Not applied	
(2) Pipeline system					
(a) Main	9	km	Poor		
(b) Lateral	13.5	km	Poor		
(c) Sprinkler	1200	nos	Poor		
5 Drainage system					
(1) Drainage canal					
(a) Main	5	km	Poor	Weeds	Rehabilitation
(b) Lateral	5	km	Poor	Weeds	Rehabilitation
(c) Intercept	-	km		Not applied	
(d) Spillway canal	-	km		Not applied	
6 Related structure					
(1) Farm pond	1	no	Good		
(2) Turnout					
(a) Main	1	no	Good		
(b) Lateral	-	nos		Not applied	
(3) Check					
(a) Main	1	no	Good		
(b) Lateral	-	nos		Not applied	
(4) Syphon					
(a) Main	-	nos		Not applied	
(b) Lateral	-	nos		Not applied	
(5) Aqueduct	-	nos		Not applied	
(6) Drop					
(a) Main	-	nos		Not applied	
(b) Lateral	-	nos		Not applied	
(7) Spillway	1	no	Good		
(8) Wasteway	1	no	Good		
(9) Impact box	-	nos		Not applied	
(10) Measuring device	-	nos		Not applied	
(11) Bridge	3	nos	Good		
(12) Irrigation crossing	1	no	Good		
(13) Drainage culvert	16	nos	Good	Not applied	
(14) Drainage gate	-	nos		Not applied	
7 Farm road	14	km	Moderate		Rehabilitation
8 Project building					
(1) Pump house	2	nos	Good		
(2) Office	2	nos	Good		
(3) Store	1	no	Good		
(4) Garage	1	no	Good		
(5) Dry yard	-	nos		Not applied	
(6) Souter house	-	nos		Not applied	
9 Others					

Table A-10 Inventory Survey Results of Project Facility (3/12)

Project name : 3.Amate
Constructed year : 1980
Developed area 101 ha
Irrigated area : 85 ha
Irrigation type : Pump + Sprinkler

Facilities	Number or Quantity	Existng Condition	Description	Judgment
1 Dam			Not applied	
(1) Embankment				
- Total capacity	- MCM			
- Effective capacity	- MCM			
- Crest length	- m			
- Crest height	- m			
(2) Spillway	- nos		Not applied	
- Design discharge	- m3/s			
2 Weir	- nos		Not applied	
3 Intake				
(1) Gate	- nos		Not applied	
(2) Valve	- nos		Not applied	
(3) Pump	4 nos	Poor		Renew
- Set up year	1980			
- Out put	120 m3/hr			
- Total head	64 m			
- Type	Centrifugal			
4 Irrigation system				
(1) Canal			Not applied	
(a) Main	- km			
(b) Lateral	- km			
(2) Pipeline system				
(a) Main	0.54 km	Poor		Renew
(b) Lateral	0.54 km	Poor		Renew
(c) Sprinkler	125 nos	Poor		Renew
5 Drainage system				
(1) Drainage canal			Not applied	
(a) Main	- km			
(b) Lateral	- km			
(c) Intercept	- km			
(d) Spillway canal	- km			
6 Related structure			Not applied	
(1) Farm pond	- nos			
(2) Turnout				
(a) Main	- nos			
(b) Lateral	- nos			
(3) Check				
(a) Main	- nos			
(b) Lateral	- nos			
(4) Syphon				
(a) Main	- nos			
(b) Lateral	- nos			
(5) Aqueduct	- nos			
(6) Drop				
(a) Main	- nos			
(b) Lateral	- nos			
(7) Spillway	- nos			
(8) Wasteway	- nos			
(9) Impact box	- nos			
(10) Measuring device	- nos			
(11) Bridge	- nos			
(12) Irrigation crossing	- nos			
(13) Drainage culvert	- nos			
(14) Drainage gate	- nos			
7 Farm road	5 km	Poor		Rehabilitation
8 Project building				
(1) Pump house	- nos		Not applied	
(2) Office	1 no	Poor		Rehabilitation
(3) Store	1 no	Poor		Rehabilitation
(4) Garage	1 no	Poor		Rehabilitation
(5) Dry yard	- nos		Not applied	
(6) Souter house	- nos		Not applied	
9 Others				
			Electrification for pump is so costly because the nearest electric station is far about 52 km.	

Table A-10 Inventory Survey Results of Project Facility (4/12)

Project name : 4.Afife
Constructed year 1983

Developed area : 880 ha
Irrigated area : 695 ha
Irrigation type : Gravity

Facilities	Number or Quantity		Existng Condition	Description	Judgment
1 Dam					
(1) Embankment			Good	Agali dam is used as supplementary water saurce.	
- Total capacity	29.45	MCM		Data of Agali dam is not available.	
- Effective capacity	12.5	MCM			
- Crest length	1648	m			
- Crest height	11.5	m			
(2) Spillway	1	nos	Good		
- Design discharge	320	m3/s			
2 Weir	-	nos			
3 Intake					
(1) Gate	1	no	Moderate	Little leakage from edge	Partial repair
- Design discharge	2.5	m3/s			
(2) Valve	-	nos		Not applied	
(3) Pump	-	nos		Not applied	
- Set up year	-				
- Out put	-	m3/hr			
- Total head	-	m			
- Type	-				
4 Irrigation system					
(1) Canal					
(a) Main	9.3	km	Good		
(b) Lateral	12	km	Moderate	Weeds are found in concrete joint.	Partial repair
(c) Sub lateral	19	km	Poor	Weeds	Rehabilitation
(2) Pipeline system				Not applied	
(a) Main	-	km			
(b) Lateral	-	km			
(c) Sprinkler	-	nos			
5 Drainage system					
(1) Drainage canal					
(a) Main	8	km	Poor	Weeds	Rehabilitation
(b) Lateral	15	km	Poor	Weeds	Rehabilitation
(c) Sub lateral	21	km	Poor	Weeds	Rehabilitation
(d) Intercept	8	km	Poor	Weeds	Rehabilitation
(e) Spillway canal	9	km	Poor	Weeds	Rehabilitation
6 Related structure					
(1) Farm pond	-	nos		Not applied	
(2) Turnout					
(a) Main	11	nos	Good		
(b) Lateral	31	nos	Good		
(c) Sub lateral	155	nos	Moderate		Partial repair
(3) Check					
(a) Main	11	nos	Good		
(b) Lateral	31	nos	Good		
(4) Syphon					
(a) Main	1	no	Good		
(b) Lateral	-	nos		Not applied	
(5) Aqueduct	-	nos		Not applied	
(6) Drop					
(a) Main	1	no	Good		
(b) Lateral	-	nos		Not applied	
(7) Spillway	1	no	Good		
(8) Wasteway	-	nos		Not applied	
(9) Impact box	-	nos		Not applied	
(10) Measuring device	-	nos		Not applied	
(11) Bridge	6	nos	Good		
(12) Irrigation crossing	-	nos		Not applied	
(13) Drainage culvert	46	nos	Good		
(14) Drainage gate	1	no	Good		
7 Farm road	34	km	Moderate		Rehabilitation
8 Project building					
(1) Pump house	-	nos		Not applied	
(2) Office	1	no	Good		
(3) Store	10	nos	Good		
(4) Garage	1	no	Poor		Rehabilitation
(5) Dry yard	10	nos	Poor		Rehabilitation
(6) Souter house	-	nos		Not applied	
9 Others					
(1) Foot bridge	47	nos	Poor	Steelpipe+ Wood	Rehabilitation
(2) Drainage culvert under High way out of project area	4	nos	Good(3) Moderate(1)	Existing capacity is too small to flow design flood discharge. Drained water is ristricted by lagoon located downstream.	Partial repair

Table A-10 Inventory Survey Results of Project Facility (5/12)

Project name : 5.Aveyime
Constructed year : 1975
Developed area 63 ha
Irrigated area : -
Irrigation type : Pump + Gravity

Facilities	Number or Quantity		Existng Condition	Description	Judgment
1 Dam				Not applied	
(1) Embankment					
- Total capacity	-	MCM			
- Effective capacity	-	MCM			
- Crest length	-	m			
- Crest height	-	m			
(2) Spillway	-	nos			
- Design discharge	-	m3/s			
2 Weir	-	nos		Not applied	
3 Intake					
(1) Gate	-	nos			
(2) Valve	-	nos			
(3) Pump	1	no	Poor		Renew
- Set up year	198				
- Out put	2040	m3/hr			
- Total head	10	m			
- Type	Centrifugal				
4 Irrigation system					
(1) Canal					
(a) Main	0.4	km	Poor		Rehabilitation
(b) Lateral	3	km	Poor		Rehabilitation
(2) Pipeline system					
(a) Main	0.128	km	Good		
(b) Lateral	-	km		Not applied	
(c) Sprinkler	-	nos		Not applied	
5 Drainage system					
(1) Drainage canal					
(a) Main	1	km	Poor		Rehabilitation
(b) Lateral	3	km	Poor		Rehabilitation
(c) Intercept	-	km		Not applied	
(d) Spillway canal	-	km		Not applied	
6 Related structure					
(1) Farm pond	-	nos		Not applied	
(2) Turnout					
(a) Main	1	no	Poor		New consruction
(b) Lateral	27	nos	Poor		New consruction
(3) Check				Not applied	
(a) Main	-	nos			
(b) Lateral	-	nos			
(4) Syphon					
(a) Main	-	nos		Not applied	
(b) Lateral	13	nos	Poor		Rehabilitation
(5) Aqueduct	-	nos		Not applied	
(6) Drop				Not applied	
(a) Main	-	nos			
(b) Lateral	-	nos			
(7) Spillway	-	nos		Not applied	
(8) Wasteway	-	nos		Not applied	
(9) Impact box	-	nos		Not applied	
(10) Measuring device	-	nos		Not applied	
(11) Bridge	-	nos		Not applied	
(12) Irrigation crossing	-	nos		Not applied	
(13) Drainage culvert	2	nos	Moderate		
(14) Drainage gate	-	nos			
7 Farm road	5	km	poor		Rehabilitation
8 Project building					
(1) Pump house	1	no	poor		Rehabilitation
(2) Office	2	nos	poor		Rehabilitation
(3) Store	1	no	poor		Rehabilitation
(4) Garage	1	no	poor		Rehabilitation
(5) Dry yard	-	nos		Not applied	
(6) Souter house	-	nos		Not applied	
9 Others					

Table A-10 Inventory Survey Results of Project facility (6/12)

Project name : 6.Kpando-Torkor
Constructed year : 1981
Developed area 40 ha
Irrigated area : 13 ha
Irrigation type : Pump + Sprinkler

Facilities	Number or Quantity	Existng Condition	Description	Judgment
1 Dam			Not applied	
(1) Embankment				
- Total capacity	- MCM			
- Effective capacity	- MCM			
- Crest length	- m			
- Crest height	- m			
(2) Spillway	- nos			
- Design discharge	- m3/s			
2 Weir	- nos		Not applied	
3 Intake				
(1) Gate	- nos		Not applied	
(2) Valve	- nos		Not applied	
(3) Pump	2 nos	Poor		Renew
- Set up year	1981			
- Out put	120 m3/hr			
- Total head	64 m			
- Type	Centrifugal			
4 Irrigation system				
(1) Canal			Not applied	
(a) Main	- km			
(b) Lateral	- km			
(2) Pipeline system				
(a) Main	0.6 km	Poor		Renew
(b) Lateral	0.2 km	Poor		Renew
(c) Sprinkler	60 nos	Poor		Renew
5 Drainage system				
(1) Drainage canal			Not applied	
(a) Main	- km			
(b) Lateral	- km			
(c) Intercept	- km			
(d) Spillway canal	- km			
6 Related structure				
(1) Farm pond	- nos		Not applied	
(2) Turnout			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(3) Check			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(4) Syphon			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(5) Aqueduct	- nos		Not applied	
(6) Drop			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(7) Spillway	- nos		Not applied	
(8) Wasteway	- nos		Not applied	
(9) Impact box	- nos		Not applied	
(10) Measuring device	- nos		Not applied	
(11) Bridge	- nos		Not applied	
(12) Irrigation crossing	- nos		Not applied	
(13) Drainage culvert	- nos		Not applied	
(14) Drainage gate	- nos		Not applied	
7 Farm road	2 km	Poor		Rehabilitation
8 Project building				
(1) Pump house	- nos		Not applied	
(2) Office	1 no	Poor		Rehabilitation
(3) Store	- nos		Not applied	
(4) Garage	- nos		Not applied	
(5) Dry yard	- nos		Not applied	
(6) Souter house	- nos		Not applied	
9 Others				

Table A-10 Inventory Survey Results of Project Facility (7/12)

Project name : 7.Mankessim
Constructed year : 1978

Developed area 17 ha
Irrigated area : 26 ha
Irrigation type : Pump + Sprinkler

Facilities	Number or Quantity	Existng Condition	Description	Judgment
1 Dam				
(1) Embankment		Good		
- Total capacity	5.67 MCM			
- Effective capacity	4.81 MCM			
- Crest length	1.95 m			
- Crest height	10.4 m			
(2) Spillway	1 nos	Moderate		Partial repair
- Design discharge	97 m3/s			
2 Weir	- nos		Not applied	
3 Intake				
(1) Gate	1 no	Moderate		Partial repair
- Design discharge	0.84 m3/s			
(2) Valve	1 no	Moderate		
- Design discharge	0.364 m3/s			
(3) Pump	2 nos	Poor		Renew
- Set up year	1983			
- Out put	135 m3/hr			
- Total head	90 m			
- Type	Centrifugal			
4 Irrigation system				
(1) Canal				
(a) Main	0.01 km	Poor		Rehabilitation
(b) Lateral	- km		Not applied	
(2) Pipeline system				
(a) Main	0.9 km	Poor		Rehabilitation
(b) Lateral	0.35 km	Poor		Rehabilitation
(c) Sprinkler	45 nos	Poor		Rehabilitation
5 Drainage system				
(1) Drainage canal			Not applied	
(a) Main	- km			
(b) Lateral	- km			
(c) Intercept	- km			
(d) Spillway canal	0.5 km	Poor		Rehabilitation
6 Related structure				
(1) Farm pond	- nos		Not applied	
(2) Turnout			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(3) Check			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(4) Syphon			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(5) Aqueduct	nos		Not applied	
(6) Drop			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(7) Spillway	- nos		Not applied	
(8) Wasteway	- nos		Not applied	
(9) Impact box	- nos		Not applied	
(10) Measuring device	- nos		Not applied	
(11) Bridge	- nos		Not applied	
(12) Irrigation crossing	- nos		Not applied	
(13) Drainage culvert	1 no	Moderate	Capacity is too small to flow design flood discharge.	Rehabilitation
(14) Drainage gate	- nos		Not applied	
7 Farm road	3 km	Moderate		Rehabilitation
8 Project building				
(1) Pump house	1 no	Poor		Rehabilitation
(2) Office	1 no	Poor		Rehabilitation
(3) Store	- nos		Not applied	
(4) Garage	- nos		Not applied	
(5) Dry yard	- nos		Not applied	
(6) Souter house	- nos		Not applied	
9 Others				

Table A-10 Inventory Survey Results of Project Facilty (8/12)

Project name : 8.Akumadan
Constructed year : 1976
Developed area 65 ha
Irrigated area : 50 ha
Irrigation type : Pump + Sprinkler

Facilities	Number or Quantity	Existng Condition	Description	Judgment
1 Dam			Not applied	
(1) Embankment				
- Total capacity	- MCM			
- Effective capacity	- MCM			
- Crest length	- m			
- Crest height	- m			
(2) Spillway	- nos			
- Design discharge	- m3/s			
2 Weir	1 no	Moderate	Crossing structure is needed.	Renew
3 Intake				
(1) Gate	- nos			
(2) Valve	- nos			
(3) Pump	3 nos	Poor	Block A (1), Block B (2)	Renew
- Set up year	1976			
- Out put	m3/hr		Block A(120m3/hr), Block B (135m3/hr)	
- Total head	m		Block A(64m), Block B (90m)	
- Type	Centrifugal			
4 Irrigation system				
(1) Canal			Not applied	
(a) Main	- km			
(b) Lateral	- km			
(2) Pipeline system				
(a) Main	3.1 km	Poor		Renew
(b) Lateral	1.2 km	Poor		Renew
(c) Sprinkler	32 nos	Poor		Renew
5 Drainage system				
(1) Drainage canal			Not applied	
(a) Main	- km			
(b) Lateral	- km			
(c) Intercept	- km			
(d) Spillway canal	- km			
6 Related structure				
(1) Farm pond	- nos		Not applied	
(2) Turnout			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(3) Check			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(4) Syphon			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(5) Aqueduct	- nos		Not applied	
(6) Drop			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(7) Spillway	- nos		Not applied	
(8) Wasteway	- nos		Not applied	
(9) Impact box	- nos		Not applied	
(10) Measuring device	- nos		Not applied	
(11) Bridge	- nos		Not applied	
(12) Irrigation crossing	- nos		Not applied	
(13) Drainage culvert	- nos		Not applied	
(14) Drainage gate	- nos		Not applied	
7 Farm road	4 km	Moderate		Rehabilitation
8 Project building				
(1) Pump house	2 nos	Poor		Rehabilitation
(2) Office	1 no	Poor		Rehabilitation
(3) Store	- nos		Not applied	
(4) Garage	- nos		Not applied	
(5) Dry yard	- nos		Not applied	
(6) Souter house	- nos		Not applied	
9 Others			Implementation of electrification for pump has been started. L= 4.65km	

Table A-10 Inventory Survey Results of Project facility (9/12)

Project name : 9.Tanoso
Constructed year : 1984

Developed area 64 ha
Irrigated area : 47 ha
Irrigation type : Pump + Sprinkler

Facilities	Number or Quantity		Existng Condition	Description	Judgment
1 Dam				Not applied	
(1) Embankment					
- Total capacity	-	MCM			
- Effective capacity	-	MCM			
- Crest length	-	m			
- Crest height	-	m			
(2) Spillway	-	nos			
- Design discharge	-	m3/s			
2 Weir	1	no	Good		
3 Intake					
(1) Gate	-	nos			
(2) Valve	-	nos			
(3) Pump	4	nos		One is unserviceable.	
- Set up year	1984				
- Out put	125	m3/hr			
- Total head	122	m			
- Type	Centrifugal				
4 Irrigation system					
(1) Canal				Not applied	
(a) Main	-	km			
(b) Lateral	-	km			
(2) Pipeline system					
(a) Main	2	km	Poor		Renew
(b) Lateral	0.54	km	Poor		Renew
(c) Sprinkler	72	nos	Poor		Renew
5 Drainage system					
(1) Drainage canal				Not applied	
(a) Main	-	km			
(b) Lateral	-	km			
(c) Intercept	-	km			
(d) Spillway canal	-	km			
6 Related structure					
(1) Farm pond	-	nos		Not applied	
(2) Turnout				Not applied	
(a) Main	-	nos			
(b) Lateral	-	nos			
(3) Check				Not applied	
(a) Main	-	nos			
(b) Lateral	-	nos			
(4) Syphon				Not applied	
(a) Main	-	nos			
(b) Lateral	-	nos			
(5) Aqueduct	-	nos		Not applied	
(6) Drop				Not applied	
(a) Main	-	nos			
(b) Lateral	-	nos			
(7) Spillway	-	nos		Not applied	
(8) Wasteway	-	nos		Not applied	
(9) Impact box	-	nos		Not applied	
(10) Measuring device	-	nos		Not applied	
(11) Bridge	-	nos		Not applied	
(12) Irrigation crossing	-	nos		Not applied	
(13) Drainage culvert	-	nos		Not applied	
(14) Drainage gate	-	nos		Not applied	
7 Farm road	5	km			Rehabilitation
8 Project building					
(1) Pump house	1	no			Rehabilitation
(2) Office	1	no			Rehabilitation
(3) Store	-	nos		Not applied	
(4) Garage	-	nos		Not applied	
(5) Dry yard	-	nos		Not applied	
(6) Souter house	-	nos		Not applied	
9 Others					

Table A-10 Inventory Survey Results of Project Facility (10/12)

Project name : 10.Bontanga
Constructed year : 1987

Developed area 450 ha
Irrigated area : 461 ha
Irrigation type : Gravity

Facilities	Number or Quantity		Existng Condition	Description	Judgment
1 Dam					
(1) Embankment			Good		
- Total capacity	25	MCM			
- Effective capacity	20	MCM			
- Crest length	1900	m			
- Crest height	12	m			
(2) Spillway	1	no	Good		
- Design discharge	85	m3/s			
2 Weir	-	nos		Not applied	
3 Intake					
(1) Gate	2	nos	Moderate	Left side canal=1, Right side canal=1	Partial repair
- Design discharge	1.5	m3/s		Both intakes are same capacity.	
(2) Valve	-	nos		Not applied	
(3) Pump	-	nos		Not applied	
- Set up year	-				
- Out put	-	m3/hr			
- Total head	-	m			
- Type	-				
4 Irrigation system					
(1) Canal					
(a) Main	12.2	km	Good		
(b) Lateral	19	km	Moderate		Partial repair
(2) Pipeline system				Not applied	
(a) Main	-	km			
(b) Lateral	-	km			
(c) Sprinkler	-	nos			
5 Drainage system					
(1) Drainage canal					
(a) Main	4	km	Poor		Rehabilitation
(b) Lateral	14	km	Poor		Rehabilitation
(c) Intercept	13	km	Poor		Rehabilitation
(d) Spillway canal	-	km		Not applied	
6 Related structure					
(1) Farm pond	-	nos		Not applied	
(2) Turnout					
(a) Main	28	nos	Good	Left = 14, Right = 14	
(b) Lateral	760	nos	Moderate	Left = 300, Right = 460	Partial repair
(3) Check					
(a) Main	19	nos	Moderate	Left = 10,Right = 9	Partial repair
(b) Lateral	-	nos		Not applied	
(4) Syphon					
(a) Main	1	no	Good		
(b) Lateral	-	nos		Not applied	
(5) Aqueduct	-	nos		Not applied	
(6) Drop					
(a) Main	6	nos	Good		
(b) Lateral	-	nos		Not applied.Step type canal is applied.	
(7) Spillway	-	nos		Not applied	
(8) Wasteway	-	nos		Not applied	
(9) Impact box	2	nos	Good		
(10) Measuring device	2	nos	Poor		Rehabilitation
(11) Bridge	-	nos		Not applied	
(12) Irrigation crossing	3	nos	Good		
(13) Drainage culvert	5	nos	Good		
(14) Drainage gate	-	nos		Not applied	
7 Farm road	36	km	Moderate		Rehabilitation
8 Project building					
(1) Pump house	-	nos		Not applied	
(2) Office	3	nos	Good		
(3) Store	6	nos	Poor		Rehabilitation
(4) Garage	1	no	Good		
(5) Dry yard	6	nos	Poor		Rehabilitation
(6) Souter house	-	nos		Not applied	
9 Others					
Bontanga river	6	km	Poor	Used as main drain	Rehabilitation

Table A-10 Inventory Survey Results of Project Facility (11/12)

Project name : 11.Subinja
Constructed year : 1976
Developed area 60 ha
Irrigated area : 13 ha
Irrigation type : Pump + Sprikler

Facilities	Number or Quantity	Existng Condition	Description	Judgment
1 Dam			Not applied	
(1) Embankment				
- Total capacity	- MCM			
- Effective capacity	- MCM			
- Crest length	- m			
- Crest height	- m			
(2) Spillway	- nos			
- Design discharge	- m3/s			
2 Weir	1 no	Poor		Rehabilitation
3 Intake				
(1) Gate	- nos			
(2) Valve	- nos			
(3) Pump	3 nos	Poor	One is unserviceable	Renew
- Set up year	1976			
- Out put	135 m3/hr			
- Total head	90 m			
- Type	Centrifugal			
4 Irrigation system				
(1) Canal			Not applied	
(a) Main	- km			
(b) Lateral	- km			
(2) Pipeline system				
(a) Main	2 km	Poor		Renew
(b) Lateral	0.7 km	Poor		Renew
(c) Sprinkler	45 nos	Poor		Renew
5 Drainage system				
(1) Drainage canal			Not applied	
(a) Main	- km			
(b) Lateral	- km			
(c) Intercept	- km			
(d) Spillway canal	- km			
6 Related structure				
(1) Farm pond	- nos		Not applied	
(2) Turnout			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(3) Check			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(4) Syphon			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(5) Aqueduct	- nos		Not applied	
(6) Drop			Not applied	
(a) Main	- nos			
(b) Lateral	- nos			
(7) Spillway	- nos		Not applied	
(8) Wasteway	- nos		Not applied	
(9) Impact box	- nos		Not applied	
(10) Measuring device	- nos		Not applied	
(11) Bridge	- nos		Not applied	
(12) Irrigation crossing	- nos		Not applied	
(13) Drainage culvert	- nos		Not applied	
(14) Drainage gate	- nos		Not applied	
7 Farm road	6 km	Poor	Weeds	Rehabilitation
8 Project building				
(1) Pump house	1 no	Poor		Rehabilitation
(2) Office	1 no	Poor		Rehabilitation
(3) Store	- nos			
(4) Garage	- nos			
(5) Dry yard	- nos			
(6) Souter house	- nos			
9 Others				

Table A-10 Inventory Survey Results of Project Facility (12/12)

Project name : 12.Okyereko
Constructed year : 1988

Developed area 40 ha
Irrigated area : 40 ha in 1994
Irrigation type : Gravity

Facilities	Number or Quantity		Existng Condition	Description	Judgment
1 Dam					
(1) Embankment			Good		
- Total capacity	2.96	MCM			
- Effective capacity	2.71	MCM			
- Crest length	6.24	m			
- Crest height	11.4	m			
(2) Spillway	1	no	Good		
- Design discharge	25	m3/s			
2 Weir	-	nos		Not applied	
3 Intake					
(1) Gate	-	nos		Not applied	
(2) Valve	2	nos	Good		
- Design discharge		m3/s		Right=0.958m3/s, Left=0.479m3/s	
(3) Pump	-	nos		Not applied	
- Set up year	-				
- Out put	-	m3/hr			
- Total head	-	m			
- Type	-				
4 Irrigation system					
(1) Canal					
(a) Main	1.3	km	Poor		Improvement
(b) Lateral	2.8	km	Poor		Improvement
(2) Pipeline system				Not applied	
(a) Main	-	km			
(b) Lateral	-	km			
(c) Sprinkler	-	nos			
5 Drainage system					
(1) Drainage canal					
(a) Main	2	km	Poor		Rehabilitation
(b) Lateral	2	km	Poor		Rehabilitation
(c) Intercept	-	km		Not applied	
(d) Spillway canal	-	km		Not applied	
6 Related structure					
(1) Farm pond	-	nos		Not applied	
(2) Turnout					
(a) Main	6	nos	Poor		Rehabilitation
(b) Lateral	30	nos	Poor		Rehabilitation
(3) Check					
(a) Main	1	no	Moderate		Rehabilitation
(b) Lateral	-	nos			
(4) Syphon					
(a) Main	-	nos			
(b) Lateral	-	nos			
(5) Aqueduct	-	nos			
(6) Drop					
(a) Main	2	nos	Poor		Rehabilitation
(b) Lateral	30	nos	Poor		Rehabilitation
(7) Spillway	-	nos			
(8) Wasteway	-	nos			
(9) Impact box	-	nos			
(10) Measuring device	1	no	Moderate		Rehabilitation
(11) Bridge	-	nos			
(12) Irrigation crossing	1	no	Poor		Rehabilitation
(13) Drainage culvert	3	nos	Good		
(14) Drainage gate	-	nos			
7 Farm road	7	km	Poor		Rehabilitation
8 Project building					
(1) Pump house	-	nos			
(2) Office	1	no	Poor		Rehabilitation
(3) Store	1	no	Poor		Rehabilitation
(4) Garage	1	no	Poor		Rehabilitation
(5) Dry yard	-	nos			
(6) Souter house	-	nos			
9 Others					
Spillway of Ayensu river	1	no	Moderate		
Ayensu river drain	1	km	Poor		Rehabilitation

Table A-11 O & M Budget for the Projects in 1995

Unit : '000 cedis

Project	Staff Number	O&M Cost for Irrigation Facilities	Staff Salaries & Allowances	Administration	Running Cost for Machinery & Vehicle	Total	Irrigated Area (ha)*	O & M Cost per ha (1)	O & M Cost per ha (2)**	Intake Method
1 Ashaiman	4	25,000	4,780	608	-	30.388	117	260	260	Gravity
2 Weija	14	61,185	15,910	6,301	6,825	90.221	220	410	379	Pump
3 Amate***	3	5,654	2,584	951	4,139	13,328	20	666	459	Pump
4 Afife****	20	40,000	27,805	9,805	27,000	104.610	880	119	88	Gravity
5 Aveyime	7	16.500	5,797	-	-	22.297	80	279	279	Pump
6 Kpando-Torkor	3	3,370	1,677	496	2,181	7.724	11	702	504	Pump
7 Mankessim	5	1,775	4,463	-	-	6,238	17	367	367	Pump
8 Akumadan	6	15,605	6,174	-	1,500	23.279	65	358	335	Pump
9 Tanoso	4	15,477	5,352	-	722	21,551	64	337	325	Pump
10 Bontanga	15	35,700	26,900	10,200	22,600	95.400	450	212	162	Gravity
11 Subinja	4	9,781	3,965	-	-	13,746	60	229	229	Pump
12 Okyereko	3	1,411	3,801	200	1,158	6,570	40	164	135	Gravity

* : assumed by making reference of Irrigated area in 1994.

** : excluding running cost of machinery and vehicle.

*** : allocated on the area basis, except operation and repair cost for pump.

**** : 1996 budget.

Table A-12 Present Condition of GIDA's Agricultural Extension in Each Irrigation Project

Projects	Developed Area (ha)	Main Crops*1 Grown in the Areas in 1994-95	No. of Farmers *2	No. of Staff in PM Office*2	No. of Extension Staff *2	Facilities and Equipment for Extension	Vehicles*6	Remarks
(1) Ashaiman	130	Paddy, Okra	120	4	2	Video, V. Camera OHP, Slide Projector	Pick-up x 2	IDC-JICA
(2) Weija	220	Tomatoes, Okra, Eggplant, Paddy	115	14	3	None	Pick-up x 1	
(3) Amate	101	Onions, Tomatoes	63	3	1	None	Pick-up x 1	
(4) Afife	880	Paddy, Okra	533	20	5	None	Pick-up x 2	
(5) Aveyime	63	Paddy*5	62	6	2	None	Pick-up x 1	
(6) Kpando-Torkor	40	Okra	118	3	1	None	-	
(7) Mankessim	17	Eggplant, Water melon, Okra	89	5	1	None	Truck x 1	
(8) Akumadan	65	Tomatoes	101	5	2	None	-	
(9) Tanoso	64	Tomatoes	188	4	2	None	-	
(10) Bontanga	450	Paddy, Onions, Okra, Tomatoes	450-600	15	4	None	Pick-up x 1, Patrol x 1	Covered by SRDP (IFAD)*4
(11) Subinja	60	Chillies, Okra	25	3	2	None	-	Covered by WFSTP (UK)*3
(12) Okyereko	40	Paddy	68	2	1	None	-	
Total	2,130		2,007	84	26			

Remarks:
- *1 Under irrigated condition
- *2 As of October 1995.
- *3 Wenchi Farming System and Training Project (UK)
- *4 Smallholder Rehabilitation Development Project (IFAD)
- *5 1994-1995 Not cultivated
- *6 Almost all extension officers of MOFA have a motorcycle, but in case of GIDA's extension staff, they have no motorcycle, except for these vehicles of O&M.

Source: Interviewed by the Study Team

Table A-13 Present Condition of the Farmers' Societies in the Irrigation Projects

Projects	Name of Farmers' Societies	No. of Member *1	Exe-cutive Staff*1	Year Estab-lished	Year Regis-tered	Bye-Laws *2	Entrance Fee (CD)	Share Capital (CD each)	Other Fee (CD/year)	Meeting of Exe. Committee per Year	Loan (1994-95) (CD)	Facilities and Equipment	Tribe of Members
(1) Ashaiman	Ashaiman Co-operative Irrigation Rice Farmers Society Ltd.	120	9	1983	1983	A	100	6,000	2,000	4 times	-	None	Ga, Ewe, etc.
(2) Weija	Weija Irrigation Co-operative Food Farmers and Marketing Society Ltd.	115	9	1983	1984	A	1,000	5.000/ha	1,000	24 times	-	None	Ga, Dangbe, Akan, etc.
(3) Amate	Amate Co-operative (IDA) Irrigation Development Authority Vegetable Growers and Marketing Society Ltd.	63	7	1993	1995	A	3,000	-	-	24 times	-	None	Kwahu
(4) Afife	Afife Rice and Vegetable Irriga-tion, Farming & Marketing Society	650	14	1994		B	2,000	-	1,000	12 times	-	None	Ewe
(5) Aveyime	Aveyime Irrigation Farmers Association	60	7	1981	1990	B	1,000	-	2,400	12 times	-	None	Ewe
(6) Kpando-Torkor	Kpand-Torkor Co-operative Farmers' Society	118	7	1974		None	2,000		-	12 times	-	None	Ewe
(7) Mankessim	Baaf-Krum Cooperative Irrigation Vege- table Growers and Marketing Society	89	7	1987		None	2,000	6,000	-	Every month during a season	-	None	Fanti
(8) Akumadan	Akumadan Cooperative Food Farmers and Marketing Society Ltd.	101	8	1976		B	None	-	-	15-20 times	7,000,000	None	Ashanti
(9) Tanoso	Tanoso Co-operative Food Farmers & Marketing Society Ltd.	188	8	1994	1994	B	2,000	-	-	Often	1,000,000	None	Ashanti
(10) Bontanga	Bontanga Co-operative Farmers' Society	450-600	8	1987		None	-	-	2,000	12 times	-	None	Dagomba
(11) Subinja	Subinja Irrigation Farmers' Co-operative Ltd.	25	5	1993		None	10,000	-	-	Often	-	None	Brong (63%). Ewe (13%). etc.
(12) Okyereko	Okyereko Irrigation Rice Farmers Co-operative	68	6	1994		None	None	5.000*3	-	24 times	-	None	Fanti

Remarks: *1 As of 1995 *3 Contribution

*2 A: Bye-Laws prepared on the basis of the form of the Department of Cooperative.
B: Bye-Laws not coincide with the form of the Department of Cooperative.

Source: Interviewed by the Study Team

Table A-14 Present Transfer Process of Project Management to Farmers' Organisations - GIDA

Developmental Stage	Formation and/or Strengthening of Existing Co-operatives	Discussing, Enumerating, Sharing of Responsibilities and Training of Farmers in New Areas	Monitoring, Evaluation and Training of Farmers in Desired Areas	Handing Over Process
Activity Areas	- Explain new concepts of project management to farmers dwelling on main policies of GIDA in project management. - Help organize farmers to select leaders - Help to register society - Help to set up Committees as enshrined in the LI 1350	- Discuss the present IDA management function isolating the various functions as contained in the Book "Proposal for Strengthening Management of Regional and Project Officers and Rationalization of Water Charges." - Identify the weaknesses and strengths of the farmers groups. - Discuss the functions and responsibilities based on identified weaknesses and strengths of both the GIDA and the farmers' groups. - Train the farmers in areas where they lack skills. - Recommend training needs to GIDA when not available at project site. - Share office and other facilities with the co-operative. - Sign all project cheques with President/ Chairman of farmers co-operative. - Fix cropping pattern and calendars with farmers. - Prepare and discuss operational budget with farmers and show them the implications of decisions taken. - Fix meeting days for management meetings with co-operatives and make sure they participate.	- Continuously evaluate performance and institute or recommend training for farmers. - Handing over more responsibilities to farmers where they have shown capabilities of handling the affairs of the particular area.	- Handing over all areas which farmers are capable of organizing supervising and managing. - Further train farmers or recommend training in areas where they are not yet capable of operating. - Advice GIDA on areas to be reserved for its own management and give reasons. - Suggest possible areas of back stopping Missions if necessary
Period of Activity	Six months	One year	One year	Six months

Source: GIDA

Table A-15 Organizational Structure and Staffing of Each Project Management Office (As of December 1995)

Projects	Irrigation	Develop-ment Area (ha)	Total No. of Staff & Labourers	Organizational Structure
(1) Ashaiman	Gravity	130	4	1- PM (Production Officer), 1-Senior Technical Officer, 1-Gate Operator, 1-Watchman
(2) Weija	Sprinkler	220	14	1- PM (Production Officer) Administrative Section : 1-Accountant, 2-Drivers, 4-Watchmen Engineering Section : 2-Technicians, 1-Artitectant Agricultural Section : 3-Extension Officers
(3) Amate	Sprinkler	101	3	1- PM (Assistant Chief Technical Officer), 1-Pump Attendant, 1-Watchman
(4) Afife	Gravity	880	20	1- PM (Production Officer) Administrative Section : 1-Administrator, 1-Accountant, 1-Storekeeper, 2-Drivers, 4-Watchmen, 1-Labourer Operation Section : (Extension) 1-Agronomist, 1-Assist. Chief Production Officer, 2-Production Officers, 1-Technical Officer (Water Management) 2-Senior Technical Assistants, 1-Technical Officer Maintenance Section : 1-Principal Technical Engineer
(5) Aveyime	Pump/Gravity	63	6	1- PM (Production Officer), 1-Senior Production Officer, 1-Pump-Attendant, 2-Watchmen, 1-Cleaner
(6) Kpando-Torkor	Sprinkler	40	3	1- PM (Senior Technical Officer), 1-Pump Attendant, 1-Watchman
(7) Mankessim	Sprinkler	17	5	1- PM (Production Officer), 1-Driver (Mechanic), 1-Pump Attendant (Mechanic), 1-Watchman, 1-Surveyer
(8) Akumadan	Sprinkler	65	5	1- PM (Production Officer), 1-Production Officer, 1-Technical Officer, 2-Watchmen
(9) Tanoso	Sprinkler	64	4	1- PM (Assistant Chief Production Officer), 1-Production Officer, 1-Pump Attendant, 1-Watchman
(10) Bontanga	Gravity	450	15	1- PM (Production Officer) Administrative Section : 1-Accountant, 1-Clerk, 1-Storekeeper, 2-Drivers, 3-Watchmen, O&M Section : 1-Mason, 1-Labourer Extension Section : 1-Agronomist, 3-Technical Officers
(11) Subinja	Sprinkler	60	3	1- PM (Senior Production Officer), 1-Production Officer, 1-Watchman
(12) Okyereko	Gravity	40	2	1- PM (Production Officer), 1-Labourer
Total		2,130	84	

Source: Interviewed by the JICA Survey Team

Table A-16 Status of Land Tenure in the Project Areas and Land Allocation at Present

	Potential	Developed Area			Un-developed Area		Remarks
	Area (ha)	ha	Status	Allocation	ha	Status	
1) Ashaiman	148	130	Community	Non	18	Community	Tema chief agreed to the land acquisition by the Government, but the Government not compensate yet to the community.
2) Weija	220	220	Community	Allocated	-	Community	Village chief agreed to its land acquisition. The Government not compensate yet to the community.
3) Amate	203	101	Community	Non	102	Community	All lands were developed by GIDA. For the land compensation, no detailed information is available from the PM Office.
4) Afife	880	880	Government	Non	-		Not allocated officially, but farmers have cultivated at same plot.
5) Aveyime	150	63	Community	Non	87	Community	All lands are not yet compensated by the Government.
6) Kpando	356	40	Government	Non	316	Community	The Government compensated only developed area, and un-developed area is not compensated yet.
7) Mankessim	256	17	Government	Allocated	239		No detailed information is available for compensation to un-developed area.
8) Akumadan	65	65	Community	Non	-		Village chief agreed to its land acquisition, but not yet compensated.
9) Tanoso	115	64	Government	Allocated	51	Community	Compensated only to the development area.
10) Bontanga	450	450	Government	Non	-		It may be compensated, but no detailed information was available on it.
11) Subinja	121	60	Government	Non	61	Community	No compensation.
12) Okyereko	111	40	Community	Allocated	71	Community	Not yet compensated. Village chief of Okyereko agreed to its acquisition under the following condition that all lands should be allocated to the village people of Okyereko.

Source: PM and Regional Offices of GIDA.

Table A-17 Irrigation Service Fee of each Irrigation Project

Projects	Irrigation	Developed area*1 (ha)	Main Crops*2 Grown in the Areas in 1994-95	No. of Farmers *3	Unit Amount of Irrigation Service Fee in 1995 (CD/ha)	Payment Period	Collecting Situation in 1994*5 (%)
(1) Ashaiman	Gravity	130	Paddy, Okra	120	50,000 (season)	After harvesting	12.3
(2) Weija	Sprinkler	220	Tomatoes, Okra, Eggplant, Paddy	115	280,000 (year)	3 times during a year	97.6
(3) Amate	Sprinkler	101	Onions, Tomatoes	63	435,500 (season)	Before cropping	100.0
(4) Afife	Gravity	880	Paddy, Okra	533	50,000 (season)	Before cropping*4	70.0 *6
(5) Aveyime	Pump/Gravity	63 *3	Paddy*3	62	100,000 (season)*3	-	-
(6) Kpando-Torkor	Sprinkler	40	Okra	118	260,000 (season)	Before cropping	100.0
(7) Mankessim	Sprinkler	17	Eggplant, Water melon, Okra	89	100,000 (season)	Before cropping	100.0
(8) Akumadan	Sprinkler	65	Tomatoes	101	165,000 (season)	Before cropping	100.0
(9) Tanoso	Sprinkler	64	Tomatoes	188	280,000 (season)	Before cropping	70.0 *6
(10) Bontanga	Gravity	450	Paddy, Onions, Okra, Tomatoes	450-600	60,000 (season)	Before cropping	60.0 *6
(11) Subinja	Sprinkler	60	Chillies, Okra	25	414,500 (season)	From cropping to harvesting	80.0 *6
(12) Okyereko	Gravity	40	Paddy	68	50,000 (season)	Before cropping	50.0 *6
Total		2,130		2,007			

*1 Actually developed area
*2 Under irrigated condition
*3 1993
*4 Irrigation service charge should pay before cropping, but some farmers have paid after harvesting.
*5 Ratio to total amount to be collected.
*6 Estimated by the Project Manager. No detailed figure is available.
*7 Paddy
*8 Onion

Source: Interviewed by the Study Team

Table A-18 Cultivation Area of Crops - Present Condition

(Unit: ha)

Projects	ASH	WEI	AMA	AFI	AVE	KPA	MAN	AKU	TAN	BON	SUB	OKY	Total
Crop Cultivation in the Project Areas													
1. Project Area (Potential Area)	148.0	220.0	203.0	880.0	150.0	356.0	256.0	65.0	115.0	450.0	121.0	111.0	3,075.0
(1) Developed Area	130.0	220.0	101.0	880.0	63.0	40.0	17.0	65.0	64.0	450.0	60.0	40.0	2,130.0
(2) Undeveloped Area	18.0	-	102.0	-	87.0	316.0	239.0	-	51.0	-	61.0	71.0	945.0
2. Cultivated Area of Crops	66.2	323.3	176.5	694.6	68.2	75.6	72.6	116.2	102.8	461.1	56.5	88.3	2,301.9
(1) Developed Area*1	59.0	323.3	85.2	694.6	28.7	13.0	31.6	116.2	77.3	461.1	52.5	21.6	1,964.1
Irrigated	59.0	323.3	85.2	694.6	-	13.0	26.4	50.2	46.8	461.1	12.6	21.6	1,793.8
Okra	19.3	53.5	-	40.0	-	13.0	3.5	-	-	99.6	*	-	228.9
Tomatoes	-	19.6	41.2	-	-	-	-	50.2	46.4	55.4	*	-	212.8
Egg Plant	-	*	-	-	-	-	10.8	-	*	13.7	5.3	-	29.8
Onion	-	*	40.0	-	-	-	-	-	-	16.6	-	-	56.6
Water melon	-	*	-	-	-	-	12.1	-	*	-	-	-	12.1
Hot Pepper	-	27.9	4.0	-	-	-	-	-	-	8.9	5.3	-	46.1
Tinda	-	43.9	-	-	-	-	-	-	-	-	-	-	43.9
Cluster bean	-	26.8	-	-	-	-	-	-	-	-	-	-	26.8
Paddy	39.7	62.5	-	654.6	-	-	-	-	-	255.9	-	21.6	1,034.3
Maize	-	*	-	-	-	-	-	-	-	11.0	-	-	11.0
Sweet potatoes	-	11.4	-	-	-	-	-	-	-	-	-	-	11.4
Others*2	-	77.7	-	-	-	-	-	-	0.4	-	2.0	-	80.1
Rainfed	-	-	-	-	28.7	-	5.2	66.0	30.5	-	39.9	-	170.3
Cassava	-	-	-	-	13.3	-	-	-	-	-	-	-	13.3
Yam	-	-	-	-	-	-	-	6.1	-	-	-	-	6.1
Sweet Potatoes	-	-	-	-	-	-	5.2	-	-	-	-	-	5.2
Maize	-	-	-	-	15.4	-	-	40.0	19.2	-	26.3	-	100.9
Cowpea	-	-	-	-	-	-	-	10.3	1.6	-	13.5	-	25.4
Tomatoes	-	-	-	-	-	-	-	0.8	-	-	-	-	0.8
Hot pepper	-	-	-	-	-	-	-	4.0	-	-	-	-	4.0
Others*3	-	-	-	-	-	-	-	4.8	9.7	-	0.1	-	14.6
(2) Undeveloped Area (Rainfed) *4	7.2	-	91.3	-	39.5	62.6	41.0	-	25.5	-	4.0	66.7	337.8
Cassava	-	-	-	-	18.3	8.3	2.7	-	9.1	-	4.0	8.2	50.6
Yam	-	-	-	-	-	7.1	-	-	-	-	-	-	7.1
Sweet Potatoes	-	-	-	-	-	-	7.1	-	-	-	-	-	7.1
Maize	7.2	-	58.6	-	21.2	47.2	18.7	-	16.4	-	-	38.1	207.4
Groundnuts	-	-	15.1	-	-	-	-	-	-	-	-	15.0	30.1
Tomatoes	-	-	-	-	-	-	5.3	-	-	-	-	5.4	10.7
Hot pepper	-	-	17.6	-	-	-	3.6	-	-	-	-	-	21.2
Sugarcane	-	-	-	-	-	-	3.6	-	-	-	-	-	3.6
Crop Cultivation in the Outside Project Areas													
Total (Rainfed)*5	n.a.	-	n.a.	708.9	n.a.	n.a.	n.a.	n.a.	190.3	535.0	n.a.	n.a.	n.a.
Cassava				122.6					68.0	-			
Maize				543.7					122.3	325.0			
Cowpea				-					-	21.0			
Groundnuts				42.6					-	136.5			
Millet				-					-	52.5			

Remarks:

*1 Data obtained from PM Offices

*2 Weija: Include cabbage, round marrow, long marrow, water melon, maize, cucumber, sponge gourd, etc.
Tanoso: Include egg plant and water melon. Subinja: Include tomatoes and okra.

*3 Akumadan and Tanoso: Include mainly groundnuts.

*4 These figures were estimated on the basis of the result of farm interview survey carried out by the Survey Team in 1995.

*5 Farmers in Afife, Tanoso and Subinja projects have cultivated crops at outside project areas. These figures were estimated form the result of farm interview survey. The farmers in Ashaiman, Amate, Aveyime, Kpando-Torkor, Mankessim, Akumadan, Subinja and Okyereko projects have also a considerable area of farm land in the outside project area, but no data is available from the farm interview survey and the PM Offices. As for the Weija project, their farming activities are mainly in the project area.

Table A-19 Crop Budget per Hectare - Present Condition (1/7)

Projects:	Ashaiman		Weija		Amate		Afife		Aveyime		Kpando		Mankessim		Akumadan		Tanoso		Bontanga		Subinja		Okyereko		Average	
Cassava																										
1. Gross Income																										
(1) Unit Yield (t/ha)		-		-		-		3.3		4.1		7.0		16.0		-		12.8		-		22.2		4.4		9.97
(2) Unit Price (CD/kg)		-		-		-		110		150		80		100		-		80		-		230		100		120
(3) Gross Income (CD1,000)		-		-		-		363		615		560		1,600		-		1,024		-		5,106		440		1,196
	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value
2. Gross Outgoing		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)
(1) Seed (kg)	-	-	-	-	-	-	931	83	600	31	1,015	18	500.0	10	-	-	832	18	-	-	500	25	558.3	32	705	31
(2) Fertilizers																										
Urea (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31	17	-	-	4	2
Ammonium sulfate (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Compound fertilizers (kg)	-	-	-	-	-	-	-	-	20	10	-	-	-	-	-	-	-	-	-	-	31	15	-	-	7	4
(3) Agro-chemicals																										
Herbicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Insecticide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fungicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(4) Farm Machinery (hr)	-		-		-		0.69		1.71		2.50		-		-		-		-		7.50		2.50		2.12	
Own machine (hr)	-	-	-	-	-	-	0.52	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	4
Hired machine (hr)	-	-	-	-	-	-	0.17	10	1.71	33	2.50	16	-	-	-	-	-	-	-	-	7.50	122	2.50	19	2.05	29
(5) Labour Requirement	-		-		-		86.6		95.9		94.8		81.6		-		115.7		-		96.3		106.7		96.7	
Family (man-day)	-	-	-	-	-	-	53.7	150	86.2	190	56.8	119	13.3	27	-	-	7.6	16	-	-	30.0	51	106.7	267	50.6	117
Exchange (man-day)	-	-	-	-	-	-	4.5	13	-	-	8.0	17	-	-	-	-	3.2	7	-	-	-	-	-	-	2.2	5
Hired (man-day)	-	-	-	-	-	-	28.4	80	9.7	21	30.0	63	68.3	137	-	-	104.9	220	-	-	66.3	113	-	-	43.9	91
(6) Miscellaneous 5%		-		-		-		18		14		12		9		-		13		-		17		16		14
(7) Irrigation Service Fees		-		-		-		-		-		-		-		-		-		-		-		-		-
Total		-		-		-		383		299		245		183		-		274		-		360		334		297
3. Net Return		-		-		-		-20		316		315		1,417		-		750		-		4,746		106		899
Sweet Potatoes																										
1. Gross Income																										
(1) Unit Yield (t/ha)		-		16.4		-		-		-		-		10.0		-		-		-		-		-		13.22
(2) Unit Price (CD/kg)		-		130		-		-		-		-		200		-		-		-		-		-		165
(3) Gross Income (CD1,000)		-		2,137		-		-		-		-		2,000		-		-		-		-		-		2,181
	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value
2. Gross Outgoing		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		CD1,000)		(CD1,000)		CD1,000)		(CD1,000)		(CD1,000)
(1) Seed (kg)	-	-	750	98	-	-	-	-	-	-	-	-	375.0	79	-	-	-	-	-	-	-	-	-	-	563.0	89
(2) Fertilizers		-				-		-		-		-				-		-		-		-		-		
Urea (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonium sulfate (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Compound fertilizers (kg)	-	-	5	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1
(3) Agro-chemicals		-				-		-		-		-				-		-		-		-		-		-
Herbicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Insecticide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fungicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(4) Farm Machinery (hr)	-	-	10.00		-	-	-	-	-	-	-	-	14.69		-	-	-	-	-	-	-	-	-	-	12.35	
Own machine (hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hired machine (hr)	-	-	10.00	50	-	-	-	-	-	-	-	-	14.69	32	-	-	-	-	-	-	-	-	-	-	12.35	41
(5) Labour Requirement	-	-	88.8		-	-	-	-	-	-	-	-	81.9		-	-	-	-	-	-	-	-	-	-	85.4	
Family (man-day)	-	-	51.9	104	-	-	-	-	-	-	-	-	51.9	104	-	-	-	-	-	-	-	-	-	-	51.9	104
Exchange (man-day)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hired (man-day)	-	-	36.9	74	-	-	-	-	-	-	-	-	30.0	60	-	-	-	-	-	-	-	-	-	-	33.5	67
(6) Miscellaneous 5%		-		16		-		-		-		-		14		-		-		-		-		-		15
(7) Irrigation Service Fees		-		-		-		-		-		-		-		-		-		-		-		-		-
Total		-		344		-		-		-		-		289		-		-		-		-		-		317
3. Net Return		-		1,793		-		-		-		-		1,711		-		-		-		-		-		1,864

Table A-19 Crop Budget per Hectare - Present Condition (2/7)

Projects:	Ashaiman		Weija		Amate		Afife		Aveyime		Kpando		Mankessim		Akumadan		Tanoso		Bontanga		Subinja		Okyereko		Average	
Yam																										
1. Gross Income																										
(1) Unit Yield (t/ha)		-		-		-		-		-		4.1		-		12.5		-		-		-		-		8.30
(2) Unit Price (CD/kg)		-		-		-		-		-		420		-		270		-		-		-		-		345
(3) Gross Income (CD1,000)		-		-		-		-		-		1,722		-		3,375		-		-		-		-		2,864
	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)
2. Gross Outgoing																									461	42
(1) Seed (kg)	-	-	-	-	-	-	-	-	-	-	506	80	-	-	417	3	-	-	-	-	-	-	-	-		
(2) Fertilizers		-		-		-		-		-				-				-		-		-		-		
Urea (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonium sulfate (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Compound fertilizers (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(3) Agro-chemicals		-		-		-		-		-				-				-		-		-		-		
Herbicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Insecticide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fungicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(4) Farm Machinery (hr)	-	-	-	-	-	-	-	-	-	-	2.35		-	-	1.67		-	-	-	-	-	-	-	-	2.01	
Own machine (hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hired machine (hr)	-	-	-	-	-	-	-	-	-	-	2.35	12	-	-	1.67	50	-	-	-	-	-	-	-	-	2.01	31
(5) Labour Requirement	-	-	-	-	-	-	-	-	-	-	124.4		-	-	120.0		-	-	-	-	-	-	-	-	122.3	
Family (man-day)	-	-	-	-	-	-	-	-	-	-	48.5	102	-	-	58.3	146	-	-	-	-	-	-	-	-	53.4	124
Exchange (man-day)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.7	17	-	-	-	-	-	-	-	-	3.4	9
Hired (man-day)	-	-	-	-	-	-	-	-	-	-	75.9	159	-	-	55.0	138	-	-	-	-	-	-	-	-	65.5	149
(6) Miscellaneous 5%		-		-		-		-		-		18		-		18		-		-		-		-		18
(7) Irrigation Service Fees		-		-		-		-		-		-		-		-		-		-		-		-		-
Total		-		-		-		-		-		371		-		372		-		-		-		-		373
3. Net Return		-		-		-		-		-		1,351		-		3,003		-		-		-		-		2,491
Maize																										
1. Gross Income																										
(1) Unit Yield (t/ha)		0.6		-		2.3		1.0		0.6		2.0		1.9		1.79		2.14		1.5		1.94		2.3		1.63
(2) Unit Price (CD/kg)		180		-		240		280		300		280		260		190		250		250		150		230		240
(3) Gross Income (CD1.000)		108		-		552		280		180		560		494		340		535		375		291		529		391
	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)	Q'ty	Value (CD1,000)
2. Gross Outgoing																										
(1) Seed (kg)	25	11	-	-	25	16	12	6	18	6	30	16	22.6	11	12	6	31	17	12	5	21	12	24.3	15	21.0	11
(2) Fertilizers																										
Urea (kg)	-	-	-	-	-	-	22	14	14	6	29	16	-	-	-	-	137	82	18	10	67	38	-	-	26	15
Ammonium sulfate (kg)	-	-	-	-	-	-	4	2	6	2	83	42	-	-	-	-	48	17	59	19	53	20	9	3	24	10
Compound fertilizers (kg)	42	20	-	-	-	-	37	24	20	10	74	41	-	-	39	19	60	25	145	67	111	53	18	9	50	24
(3) Agro-chemicals																										
Herbicide (lit.)	-	-	-	-	-	-	-	-	-	-	0.33	4	-	-	-	-	-	-	0.39	6	-	-	-	-	0.07	1
Insecticide (lit.)	-	-	-	-	-	-	-	-	-	-	0.13	2	-	-	-	-	0.12	2	0.47	-	1.97	1	-	-	0.24	0
Fungicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.95	1	-	-	-	-	-	-	0.54	0
(4) Farm Machinery (hr)	8.33		-		5.23		2.90		2.02		4.21		2.67		0.66		2.02		3.91		4.33		8.10		4.04	
Own machine (hr)	-	-	-	-	-	-	0.72	10	-	-	0.58	6	0.49	3	-	-	-	-	1.48	14	-	-	-	-	0.30	3
Hired machine (hr)	8.33	33	-	-	5.23	62	2.18	32	2.02	29	3.63	34	2.18	14	0.66	47	2.02	47	2.43	23	4.33	53	8.10	42	3.74	38
(5) Labour Requirement	25.2		-		175.6		67.4		78.4		111.5		117.1		77.2		90.1		83.4		65.7		112.0		91.3	
Family (man-day)	15.8	46	-	-	19.2	48	31.6	88	78.0	172	73.0	153	48.1	96	38.6	97	14.9	31	53.9	59	16.1	27	80.5	201	42.7	93
Exchange (man-day)	-	-	-	-	-	-	0.7	2	-	-	3.7	8	2.9	6	-	-	1.7	4	2.0	2	1.7	3	-	-	1.2	2
Hired (man-day)	9.4	27	-	-	156.4	391	35.1	98	0.4	1	34.8	73	66.1	132	38.6	97	73.5	154	27.5	30	47.9	81	31.5	79	47.4	106
(6) Miscellaneous 5%		7		-		26		14		11		20		13		13		19		12		14		17		15
(7) Irrigation Service Fees		-		-		-		-		-		-		-		-		-		-		-		-		-
Total		144		-		543		290		237		415		275		279		399		247		302		366		318
3. Net Return		-36		-		9		-10		-57		145		219		61		136		128		-11		163		73

Table A-19 Crop Budget per Hectare - Present Condition (3/7)

Projects:	Ashaiman		Weija		Amate		Afife		Aveyime		Kpando		Mankessim		Akumadan		Tanoso		Bontanga		Subinja		Okyereko		Average	
Paddy (Rice)																										
1. Gross Income																										
(1) Unit Yield (t/ha)		3.7		3.7		-		4.1		-		-		-		-		-		5.45		-		3.75		4.10
(2) Unit Price (CD/kg)		390		350		-		365		-		-		-		-		-		290		-		480		375
(3) Gross Income (CD1,000)		1,443		1,295		-		1,497		-		-		-		-		-		1,581		-		1,800		1,538
	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value
2. Gross Outgoing		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)
(1) Seed (kg)	121	37	79	27	-	-	103	46	-	-	-	-	-	-	-	-	-	-	106	27	-	-	59.9	17	94.0	31
(2) Fertilizers						-				-		-		-		-		-				-				
Urea (kg)	98	41	55	31	-	-	179	115	-	-	-	-	-	-	-	-	-	-	129	68	-	-	13	5	95	52
Ammonium sulfate (kg)	93	36	63	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	128	42	-	-	113	41	79	29
Compound fertilizers (kg)	212	100	375	184	-	-	180	115	-	-	-	-	-	-	-	-	-	-	175	81	-	-	225	108	233	118
(3) Agro-chemicals						-				-		-		-		-		-				-				
Herbicide (lit.)	5.29	36	4.69	24	-	-	2.66	18	-	-	-	-	-	-	-	-	-	-	6.25	23	-	-	-	-	3.78	20
Insecticide (lit.)	1.47	16	0.23	6	-	-	1.27	19	-	-	-	-	-	-	-	-	-	-	0.03	4	-	-	-	-	0.60	9
Fungicide (lit.)	-	-	-	-	-	-	0.05	0	-	-	-	-	-	-	-	-	-	-	0.32	1	-	-	-	-	0.07	0
(4) Farm Machinery (hr)	11.76		3.44		-	-	8.96		-	-	-	-	-	-	-	-	-	-	5.16		-	-	10.85		8.03	
Own machine (hr)	-	-	-	-	-	-	7.40	73	-	-	-	-	-	-	-	-	-	-	0.28	4	-	-	-	-	1.54	15
Hired machine (hr)	11.76	74	3.44	80	-	-	1.56	15	-	-	-	-	-	-	-	-	-	-	4.88	69	-	-	10.85	52	6.50	58
(5) Labour Requirement	103.9		96.6		-	-	120.6		-	-	-	-	-	-	-	-	-	-	116.0		-	-	124.7		112.3	
Family (man-day)	35.2	102	42.2	84	-	-	25.5	71	-	-	-	-	-	-	-	-	-	-	34.5	38	-	-	39.3	98	35.3	79
Exchange (man-day)	0.7	2	-	-	-	-	4.7	13	-	-	-	-	-	-	-	-	-	-	4.5	5	-	-	-	-	2.0	4
Hired (man-day)	68.0	197	54.4	109	-	-	90.4	253	-	-	-	-	-	-	-	-	-	-	77.0	85	-	-	85.4	214	75.0	172
(6) Miscellaneous 5%		33		29		-		37		-		-		-		-		-		22		-		27		29
(7) Irrigation Service Fees		50		140		-		50		-		-		-		-		-		60		-		50		70
Total		733		740		-		825		-		-		-		-		-		529		-		614		688
3. Net Return		710		555		-		672		-		-		-		-		-		1,052		-		1,186		850
Egg Plant (Garden Egg)																										
1. Gross Income																										
(1) Unit Yield (t/ha)		-		10.8		-		-		-		-		12.80		-		-		-		11.3		-		11.60
(2) Unit Price (CD/kg)		-		470		-		-		-		-		230		-		-		-		230		-		310
(3) Gross Income (CD1,000)		-		5,076		-		-		-		-		2,944		-		-		-		2,599		-		3,596
	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value
2. Gross Outgoing		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)
(1) Seed (kg)	-	-	1	31	-	-	-	-	-	-	-	-	0.5	14	-	-	-	-	-	-	0.4	6	-	-	0.5	17
(2) Fertilizers		-				-				-						-		-		-				-		
Urea (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58	32	-	-	19	11
Ammonium sulfate (kg)	-	-	125	48	-	-	-	-	-	-	-	-	101	42	-	-	-	-	-	-	184	70	-	-	137	53
Compound fertilizers (kg)	-	-	319	156	-	-	-	-	-	-	-	-	110	54	-	-	-	-	-	-	197	95	-	-	209	102
(3) Agro-chemicals		-				-				-						-		-		-				-		
Herbicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Insecticide (lit.)	-	-	6.61	118	-	-	-	-	-	-	-	-	2.55	24	-	-	-	-	-	-	3.82	53	-	-	4.33	65
Fungicide (lit.)	-	-	3.67	42	-	-	-	-	-	-	-	-	0.64	19	-	-	-	-	-	-	1.34	12	-	-	1.88	24
Others (lit.)	-	-	2.61	14	-	-	-	-	-	-	-	-	0.28	7	-	-	-	-	-	-	0.26	-	-	-	1.05	7
(4) Farm Machinery (hr)	-	-	18.38		-	-	-	-	-	-	-		11.11		-	-	-	-	-	-	10.00		-	-	13.16	
Own machine (hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hired machine (hr)	-	-	18.38	61	-	-	-	-	-	-	-	-	11.11	46	-	-	-	-	-	-	10.00	80	-	-	13.16	62
(5) Labour Requirement	-	-	389.5		-	-	-	-	-	-	-	-	174.4		-	-	-	-	-	-	383.2		-	-	315.7	
Family (man-day)	-	-	234.0	468	-	-	-	-	-	-	-	-	83.5	167	-	-	-	-	-	-	258.7	440	-	-	192.1	358
Exchange (man-day)	-	-	79.6	159	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26.5	53
Hired (man-day)	-	-	75.9	152	-	-	-	-	-	-	-	-	90.9	182	-	-	-	-	-	-	124.5	212	-	-	97.1	182
(6) Miscellaneous 5%		-		63		-		-		-		-		28		-		-		-		50		-		47
(7) Irrigation Service Fees		-		140		-		-		-		-		50		-		-		-		415		-		202
Total		-		1,458		-		-		-		-		633		-		-		-		1,465		-		1,185
3. Net Return		-		3,618		-		-		-		-		2,311		-		-		-		1,134		-		2,411
													Inter cropping with water melon														

Table A-19 Crop Budget per Hectare - Present Condition (4/7)

Projects:		Ashaiman		Weija		Amate		Afife		Aveyime		Kpando		Mankessim		Akumadan		Tanoso		Bontanga		Subinja		Okyereko		Average	
Okra																											
1. Gross Income																											
(1) Unit Yield	(t/ha)		6.0		9.16		-		9.4		-		10.0		4.83		-		-		9.42		-		-		8.14
(2) Unit Price	(CD/kg)		290		200		-		500		-		500		300		-		-		150		-		-		320
(3) Gross Income	(CD1,000)		1,740		1,832		-		4,700		-		5,000		1,449		-		-		1,413		-		-		2,605
		Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value
2. Gross Outgoing			(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)
(1) Seed	(kg)	7	49	5	42	-	-	4	20	-	-	24	91	2.2	25	-	-	-	-	7	8	-	-	-	-	8.0	39
(2) Fertilizers							-				-						-		-						-		
Urea	(kg)	18	8	26	15	-	-	14	9	-	-	29	16	-	-	-	-	-	-	-	-	-	-	-	-	15	8
Ammonium sulfate	(kg)	32	12	120	46	-	-	10	4	-	-	262	134	77	32	-	-	-	-	188	62	-	-	-	-	115	48
Compound fertilizers	(kg)	211	99	156	76	-	-	-	-	-	-	262	147	77	38	-	-	-	-	292	134	-	-	-	-	166	82
(3) Agro-chemicals							-				-						-		-						-		
Herbicide	(lit.)	-	-	-	-	-	-	-	-	-	-	0.29	3	-	-	-	-	-	-	1.67	-	-	-	-	-	0.33	1
Insecticide	(lit.)	7.75	93	4.06	79	-	-	0.14	3	-	-	22.35	279	3.22	20	-	-	-	-	26.25	48	-	-	-	-	10.63	87
Fungicide	(lit.)	0.25	1	7.34	19	-	-	-	-	-	-	2.47	18	0.36	36	-	-	-	-	-	4	-	-	-	-	1.74	13
Others	(lit.)	0.75	2	2.50	33	-	-	-	-	-	-	7.06	54	-	-	-	-	-	-	-	-	-	-	-	-	1.72	15
(4) Farm Machinery	(hr)	7.06		12.09		-	-	0.18		-	-	5.06		15.00		-	-	-	-	4.59		-		-	-	7.33	
Own machine	(hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.67	26	-	-	-	-	0.28	4
Hired machine	(hr)	7.06	55	12.09	103	-	-	0.18	10	-	-	5.06	40	15.00	48	-	-	-	-	2.92	45	-	-	-	-	7.05	50
(5) Labour Requirement		164.8		167.9		-	-	140.0		-	-	361.4		312.9		-	-	-	-	247.3		-		-	-	232.4	
Family	(man-day)	48.3	140	104.9	210	-	-	32.9	92	-	-	193.4	406	211.9	424	-	-	-	-	124.4	137	-	-	-	-	119.3	235
Exchange	(man-day)	4.0	12	-	-	-	-	-	-	-	-	13.2	28	25.5	51	-	-	-	-	2.1	2	-	-	-	-	7.5	16
Hired	(man-day)	112.5	326	63.0	126	-	-	107.1	300	-	-	154.8	325	75.5	151	-	-	-	-	120.8	133	-	-	-	-	105.6	227
(6) Miscellaneous	5%		40		39		-		22		-		77		41		-		-		30		-		-		41
(7) Irrigation Service Fees			50		140		-		-		-		260		100		-		-		60		-		-		102
Total			887		952		-		460		-		1,878		966		-		-		589		-		-		972
3. Net Return			853		880		-		4,240		-		3,122		483		-		-		724		-		-		1,633
Onion																											
1. Gross Income																											
(1) Unit Yield	(t/ha)		-		-		8.5		-		-		-		-		-		-		14.5		-		-		11.50
(2) Unit Price	(CD/kg)		-		-		650		-		-		-		-		-		-		180		-		-		415
(3) Gross Income	(CD1,000)		-		-		5,525		-		-		-		-		-		-		2,610		-		-		4,773
		Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value
2. Gross Outgoing			(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)
(1) Seed	(kg)	-	-	-	-	12	587	-	-	-	-	-	-	-	-	-	-	-	-	10	200	-	-	-	-	11	394
(2) Fertilizers			-		-				-		-		-		-		-		-				-		-		
Urea	(kg)	-	-	-	-	13	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	2
Ammonium sulfate	(kg)	-	-	-	-	46	17	-	-	-	-	-	-	-	-	-	-	-	-	250	83	-	-	-	-	148	50
Compound fertilizers	(kg)	-	-	-	-	216	102	-	-	-	-	-	-	-	-	-	-	-	-	250	115	-	-	-	-	233	109
(3) Agro-chemicals			-		-				-		-		-		-		-		-				-		-		
Herbicide	(lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Insecticide	(lit.)	-	-	-	-	3.99	24	-	-	-	-	-	-	-	-	-	-	-	-	3.00	12	-	-	-	-	3.50	18
Fungicide	(lit.)	-	-	-	-	2.66	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.33	21
(4) Farm Machinery	(hr)	-	-	-	-	9.11		-	-	-	-	-	-	-	-	-	-	-	-	14.25		-		-	-	11.68	
Own machine	(hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hired machine	(hr)	-	-	-	-	9.11	84	-	-	-	-	-	-	-	-	-	-	-	-	14.25	117	-	-	-	-	11.68	101
(5) Labour Requirement		-	-	-	-	314.1		-	-	-	-	-	-	-	-	-	-	-	-	343.9		-		-	-	329.1	
Family	(man-day)	-	-	-	-	108.4	271	-	-	-	-	-	-	-	-	-	-	-	-	77.9	86	-	-	-	-	93.2	179
Exchange	(man-day)	-	-	-	-	81.4	204	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.7	102
Hired	(man-day)	-	-	-	-	124.3	311	-	-	-	-	-	-	-	-	-	-	-	-	266.0	293	-	-	-	-	195.2	302
(6) Miscellaneous	5%		-		-		82		-		-		-		-		-		-		45		-		-		64
(7) Irrigation Service Fees			-		-		436		-		-		-		-		-		-		60		-		-		248
Total			-		-		2,164		-		-		-		-		-		-		1,011		-		-		1,590
3. Net Return			-		-		3,361		-		-		-		-		-		-		1,599		-		-		3,183

Table A-19 Crop Budget per Hectare - Present Condition (5/7)

Projects:	Ashaiman		Weija		Amate		Afife		Aveyime		Kpando		Mankessim		Akumadan		Tanoso		Bontanga		Subinja		Okyereko		Average	
Hot Pepper																										
1. Gross Income																										
(1) Unit Yield (t/ha)		-		0.8		1.0		-		0.5		-		1.0		-		-		-		0.8		-		0.82
(2) Unit Price (CD/kg)		-		1,600		2,040		-		1,200		-		2,000		-		-		-		1,610		-		1,690
(3) Gross Income (CD1,000)		-		1,280		2,040		-		600		-		2,000		-		-		-		1,288		-		1,386
	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value
2. Gross Outgoing		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)
(1) Seed (kg)	-	-	1	28	1	32	-	-	6	30	-	-	1.0	11	-	-	-	-	-	-	1	7	-	-	2	22
(2) Fertilizers		-						-				-				-		-		-				-		-
Urea (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonium sulfate (kg)	-	-	94	36	-	-	-	-	-	-	-	-	50	21	-	-	-	-	-	-	188	71	-	-	66	26
Compound fertilizers (kg)	-	-	78	38	36	17	-	-	-	-	-	-	50	25	-	-	-	-	-	-	229	110	-	-	79	38
(3) Agro-chemicals		-						-				-				-		-		-				-		-
Herbicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Insecticide (lit.)	-	-	2.50	23	1.39	8	-	-	-	-	-	-	1.63	9	-	-	-	-	-	-	3.54	53	-	-	1.81	23
Fungicide (lit.)	-	-	3.75	17	0.36	3	-	-	-	-	-	-	-	5	-	-	-	-	-	-	1.21	24	-	-	1.06	12
Others (lit.)	-	-	9.38	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.42	3	-	-	1.96	10
(4) Farm Machinery (hr)	-	-	4.84		2.86		-	-	20.00		-	-	8.75		-	-	-	-	-	-	10.83		-	-	9.46	
Own machine (hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hired machine (hr)	-	-	4.84	64	2.86	36	-	-	20.00	150	-	-	8.75	35	-	-	-	-	-	-	10.83	91	-	-	9.46	75
(5) Labour Requirement	-	-	270.4		361.4		-	-	365.0		-	-	265.3		-	-	-	-	-	-	316.7		-	-	315.8	
Family (man-day)	-	-	64.1	128	151.7	379	-	-	305.0	671	-	-	88.4	177	-	-	-	-	-	-	167.1	284	-	-	155.3	328
Exchange (man-day)	-	-	-	-	14.3	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.3	6	-	-	3.5	8
Hired (man-day)	-	-	206.3	413	195.4	489	-	-	60.0	132	-	-	176.9	354	-	-	-	-	-	-	146.3	249	-	-	157.0	327
(6) Miscellaneous 5%		-		39		50		-		49		-		32		-		-		-		45		-		44
(7) Irrigation Service Fees		-		140		436		-		-		-		100		-		-		-		415		-		273
Total		-		953		1,486		-		1,032		-		769		-		-		-		1,358		-		1,197
3. Net Return		-		327		554		-		-432		-		1,231		-		-		-		-70		-		189
Tomatoes																										
1. Gross Income																										
(1) Unit Yield (t/ha)		-		7.35		5.85		-		-		-		2.2		4.19		7.04		16.02		1.8		4.4		6.20
(2) Unit Price (CD/kg)		-		200		380		-		-		-		110		480		480		125		350		200		290
(3) Gross Income (CD1,000)		-		1,470		2,223		-		-		-		242		2,011		3,379		2,003		630		880		1,798
	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value
2. Gross Outgoing		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)
(1) Seed (kg)	-	-	1	13	3	48	-	-	-	-	-	-	0.3	5	0.4	5	1	20	1	5	1	5	1.5	15	1.0	15
(2) Fertilizers		-						-				-														
Urea (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	30	-	-	-	-	-	-	6	4
Ammonium sulfate (kg)	-	-	4	2	25	9	-	-	-	-	-	-	-	-	225	77	125	45	141	47	63	24	-	-	73	26
Compound fertilizers (kg)	-	-	58	28	150	71	-	-	-	-	-	-	-	-	325	156	213	89	141	65	94	45	156	75	142	66
(3) Agro-chemicals		-						-				-														
Herbicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.48	4	-	-	-	-	0.19	1
Insecticide (lit.)	-	-	0.87	19	6.00	20	-	-	-	-	-	-	0.09	1	2.13	33	3.50	50	4.73	22	1.88	31	3.13	70	2.79	31
Fungicide (lit.)	-	-	63.82	6	-	34	-	-	-	-	-	-	0.14	1	7.63	30	4.88	76	1.04	9	3.44	8	-	-	10.12	21
Others (lit.)	-	-	0.03	1	-	-	-	-	-	-	-	-	-	-	2.13	14	-	-	0.30	1	-	-	0.31	4	0.35	3
(4) Farm Machinery (hr)	-	-	7.74		5.75		-	-	-	-	-	-	5.45		0.25		28.75		5.77		3.75		5.00		7.81	
Own machine (hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hired machine (hr)	-	-	7.74	61	5.75	65	-	-	-	-	-	-	5.45	16	0.25	9	28.75	75	5.77	81	3.75	15	5.00	49	7.81	46
(5) Labour Requirement	-	-	121.9		195.9		-	-	-	-	-	-	145.0		205.0		147.3		186.2		159.4		72.6		154.1	
Family (man-day)	-	-	71.8	144	45.6	114	-	-	-	-	-	-	78.6	157	100.6	252	96.8	203	81.1	89	134.4	228	57.6	144	83.3	166
Exchange (man-day)	-	-	-	-	84.5	211	-	-	-	-	-	-	7.3	15	0.8	2	-	-	3.6	4	-	-	-	-	12.0	29
Hired (man-day)	-	-	50.1	100	65.8	165	-	-	-	-	-	-	59.1	118	103.6	259	50.5	106	101.5	112	25.0	43	15.0	38	58.8	118
(6) Miscellaneous 5%		-		19		37		-		-		-		16		42		35		22		20		20		26
(7) Irrigation Service Fees		-		140		436		-		-		-		-		165		280		60		207		-		161
Total		-		535		1,210		-		-		-		329		1,044		1,009		521		626		415		713
3. Net Return		-		935		1,013		-		-		-		-87		967		2,370		1,482		4		465		1,085
																							Village irrigation			

Table A-19 Crop Budget per Hectare - Present Condition (6/7)

Projects:	Ashaiman		Weija		Amate		Afife		Aveyime		Kpando		Mankessim		Akumadan		Tanoso		Bontanga		Subinja		Okyereko		Average	
Cowpea																										
1. Gross Income																										
(1) Unit Yield (t/ha)		-		0.6		-		-		-		-		-		-		-		0.7		0.98		-		0.80
(2) Unit Price (CD/kg)		-		440		-		-		-		-		-		-		-		300		300		-		350
(3) Gross Income (CD1,000)		-		264		-		-		-		-		-		-		-		210		294		-		280
	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value
2. Gross Outgoing		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)
(1) Seed (kg)	-	-	8	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	17	18	18	-	-	13.0	15
(2) Fertilizers		-				-		-		-		-		-		-		-						-		
Urea (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonium sulfate (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Compound fertilizers (kg)	-	-	63	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	10
(3) Agro-chemicals		-				-		-		-		-		-		-		-						-		-
Herbicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Insecticide (lit.)	-	-	1.68	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.25	16	2.50	50	-	-	1.81	33
Fungicide (lit.)	-	-	1.68	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.56	11
(4) Farm Machinery (hr)	-	-	5.63		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.35		5.42		-	-	4.13	
Own machine (hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hired machine (hr)	-	-	5.63	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.35	39	5.42	48	-	-	4.13	46
(5) Labour Requirement	-	-	47.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	96.1		52.5		-	-	65.3	
Family (man-day)	-	-	4.4	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	81.6	90	12.5	21	-	-	32.8	40
Exchange (man-day)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hired (man-day)	-	-	43.1	86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.5	16	40.0	68	-	-	32.5	57
(6) Miscellaneous 5%		-		13		-		-		-		-		-		-		-		9		10		-		11
(7) Irrigation Service Fees		-		-		-		-		-		-		-		-		-		-		-		-		-
Total		-		270		-		-		-		-		-		-		-		187		215		-		223
3. Net Return		-		-6		-		-		-		-		-		-		-		23		79		-		57
Groundnuts																										
1. Gross Income																										
(1) Unit Yield (t/ha)		-		-		1.8		1.0		-		-		-		-		-		0.4		-		1.3		1.13
(2) Unit Price (CD/kg)		-		-		370		1,020		-		-		-		-		-		360		-		210		490
(3) Gross Income (CD1,000)		-		-		666		1,020		-		-		-		-		-		144		-		273		554
	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value
2. Gross Outgoing		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)
(1) Seed (kg)	-	-	-	-	78	57	50	50	-	-	-	-	-	-	-	-	-	-	29	20	-	-	45	40	50	42
(2) Fertilizers		-		-						-		-		-		-		-								
Urea (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonium sulfate (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Compound fertilizers (kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(3) Agro-chemicals		-		-						-		-		-		-		-								
Herbicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Insecticide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fungicide (lit.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(4) Farm Machinery (hr)	-	-	-	-	4.79		1.50		-	-	-	-	-	-	-	-	-	-	3.11		-	-	2.05		2.86	
Own machine (hr)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hired machine (hr)	-	-	-	-	4.79	44	1.50	75	-	-	-	-	-	-	-	-	-	-	3.11	31	-	-	2.05	21	2.86	43
(5) Labour Requirement	-	-	-	-	105.4		99.0		-	-	-	-	-	-	-	-	-	-	119.8		-	-	117.3		110.4	
Family (man-day)	-	-	-	-	80.0	200	35.5	99	-	-	-	-	-	-	-	-	-	-	55.8	61	-	-	84.3	211	63.9	143
Exchange (man-day)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.1	8	-	-	-	-	1.8	2
Hired (man-day)	-	-	-	-	25.4	64	63.5	178	-	-	-	-	-	-	-	-	-	-	56.9	63	-	-	33.0	83	44.7	97
(6) Miscellaneous 5%		-		-		18		20		-		-		-		-		-		9		-		18		16
(7) Irrigation Service Fees		-		-		-		-		-		-		-		-		-		-		-		-		-
Total		-		-		383		422		-		-		-		-		-		192		-		373		343
3. Net Return		-		-		283		598		-		-		-		-		-		-48		-		-100		211

Source: Farm interview survey and field investigation by the Study Team and data obtained from the PM Offices.

Table A-19 Crop Budget per Hectare - Present Condition (7/7)

Projects		Bontanga		Mankessim				Weija					
		Millet		Sugarcane		Water Melon		Cabbage		Clus/Bean		Tinda	
1. Gross Income													
(1) Unit Yield	(t/ha)	0.9		62.5		7.67		17.4		6.15		14.57	
(2) Unit Price	(CD/kg)	130		10		240		180		300		460	
(3) Gross Income	(CD1,000)	117		625		1,841		3,132		1,845		6,702	
		Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value	Q'ty	Value
2. Gross Outgoing			(CD1,000)		(CD1,000)		(CD1,000)		(CD1,000)		(1,000)		(CD1,000)
(1) Seed	(kg)	3.0	1	563	39	1.0	27	0.2	59	7.5	75	2.4	36
(2) Fertilizers													
Urea	(kg)	-	-	-	-	-	-	-	-	-	-	14	8
Ammonium sulfate	(kg)	-	-	-	-	69	29	163	62	-	-	19	7
Compound fertilizers	(kg)	-	-	31	15	75	37	348	171	-	-	92	45
Compost	(kg)	500	7	-	-	-	-	-	-	-	-	-	-
Others	(kg)	-	-	-	-	-	-	-	-	-	-	-	-
(3) Agro-chemicals													
Herbicide	(lit.)	-	-	-	-	-	-	-	-	-	-	-	-
Insecticide	(lit.)	-	-	-	-	2.84	30	5.66	150	-	-	1.73	38
Fungicide	(lit.)	-	-	-	-	2.57	22	0.98	32	-	-	0.48	10
Others	(lit.)	-	-	-	-	0.28	5	3.61	24	-	-	4.42	14
(4) Farm Machinery	(hr)	10.00		-		10.28		7.99		7.50		6.06	
Own machine	(hr)	-	-	-	-	-	-	-	-	-	-	-	-
Hired machine	(hr)	10.00	20	-	-	10.28	27	7.99	74	7.50	60	6.06	51
(5) Labour Requirement		64.5		60.1		134.0		223.6		158.8		112.1	
Family	(man-day)	10.0	11	28.8	58	79.0	158	165.2	330	108.8	218	65.1	130
Exchange	(man-day)	-	-	-	-	1.2	2	-	-	-	-	-	-
Hired	(man-day)	54.5	60	31.3	63	53.8	108	58.4	117	50.0	100	47.0	94
(6) Miscellaneous	5%		5		9		22		51		23		22
(7) Irrigation Service Fees			-		-		50		140		140		140
Total			104		184		517		1,210		616		595
3. Net Return			13		441		1,324		1,922		1,229		6,107
						Inter cropping							
						with garden egg							

Source: Farm interview survey and field investigation by the Study Team and data obtained from the PM Offices.