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**Community Based
Traditional Irrigation
Schemes Performance: A
Case Study of Upper Awash
River Basin in Addis Ababa
sub-Catchments**

Objectives

1. To study the water use efficiency of traditional small scale irrigation schemes in Addis Ababa catchments
2. To study the Economic benefit of traditional small scale irrigation schemes.

Figure 2. Major River Basins in Ethiopia

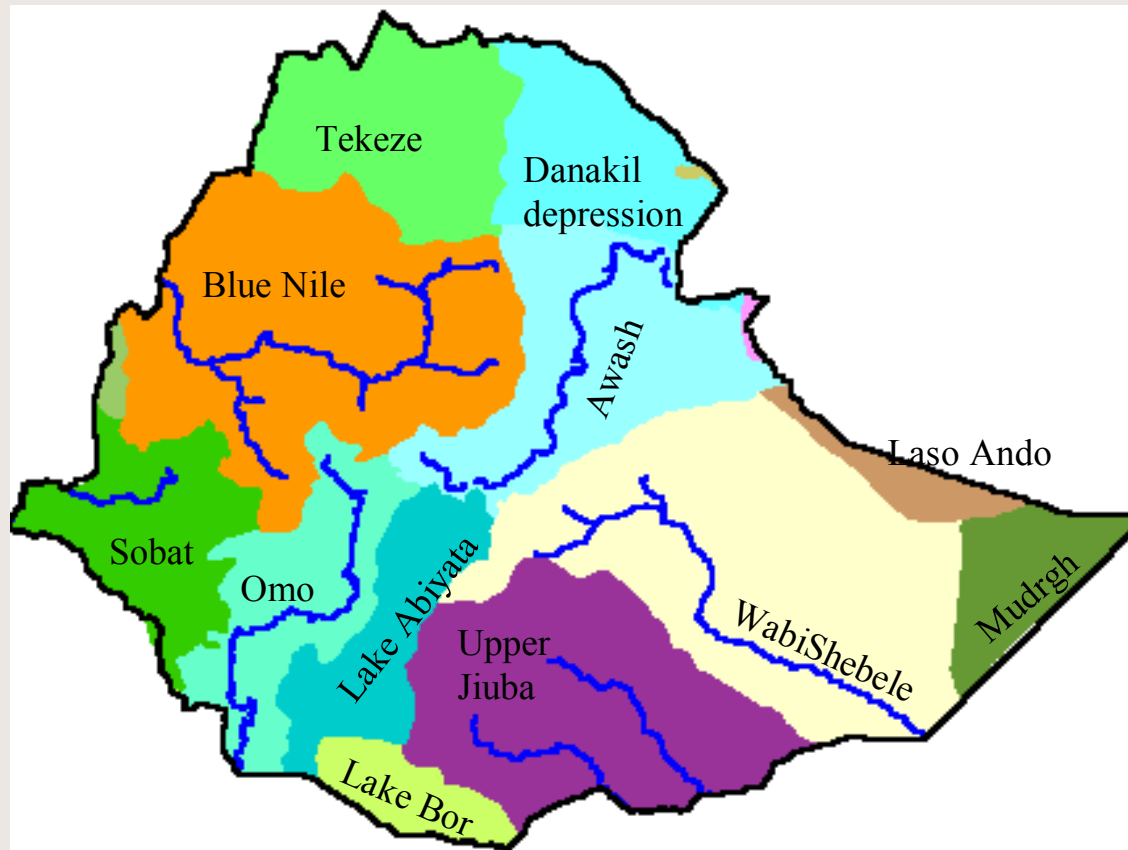


Figure 4. Irrigation Development in Addis Ababa sub-catchments in Upper Awash Basin

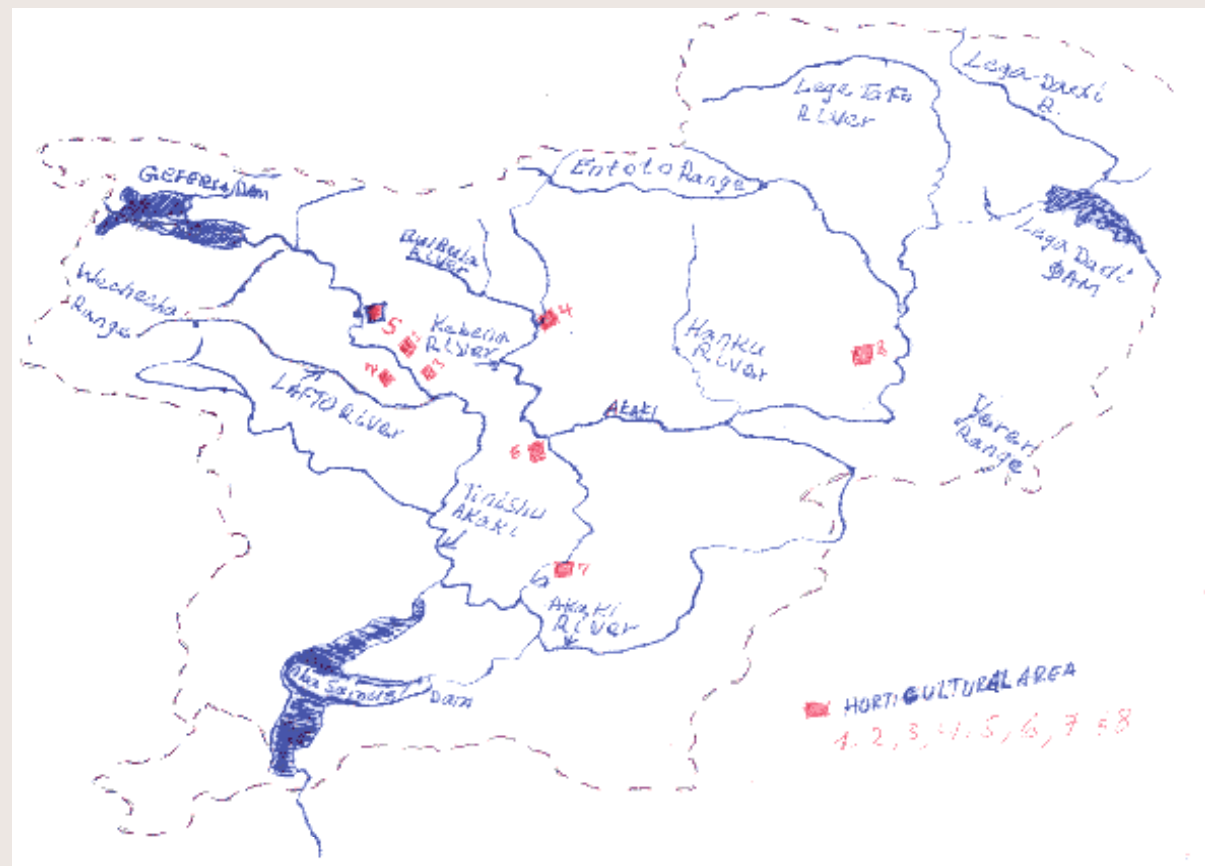


Table 1. Small scale irrigation development in Awash basin.

the basins	Traditional		Modern		Area (ha)	
	Area (ha)	Beneficiaries	Area (ha)	Beneficiaries		
Oromia	6,222	24,282	1,249	2409	7471	26,691
Afar	3114	12,581	-	-	3114	12,581
Amhara	11,273	60,114	3337	11,608	14,610	71,722
Addis Ababa	389.6	977	-	-	389.6	977
Dire Dawa	866	4342	345.5	1629	1211.5	5971
Grand total	21864.6	102,296	4931.5	15,646	26796.1	117,942

Table 2. Traditional irrigation schemes in the sub-basin of Addis Ababa catchments

Shankla Ena Kacha Fabrica	Shankla	Coca Cola Fabrica	8.5	11	41	52	Farmers	Surface irrigation
Tinshu Akaki Ena Keranio	T. Akaki	Keranyo	7.5	3	23	26	Farmers	Surface irrigation
Tinshu Akaki Mekanisa Goffa & Furi Saris	T. Akaki	Goffa Sefer	150	40	204	244	Farmers	Surface irrigation
Kebena Ena Bulubla	Kebena & Bulbula	Peackoc k Park	7.5	6	25	31	Farmers	Pump operated
Kolfae Ena Lideta	T. Akaki	Kolfae	51	17	92	109	Farmers	Surface irrigation
Fanta	Akaki	Akaki	10	-	28	28	Farmers	Surface irrigation
Mekana Brhan Tesfa	Akaki	Akaki	12	45	20	65	Farmers	Pump operated
Mekana Yersha Limat Abat Turptengoch	Akaki	Akaki	5	5	17	22	Farmers	Surface irrigation
Fnote Selam	Akaki	Akaki	5	5	60	65	Farmers	Surface irrigation
Abat Enat Turengoch	Akaki	Akaki	5.5	99	126	225	Farmers	Pump operated
Chello	Akaki	Akaki	4	90	-	90	Farmers	
Bole Lemi	Akaki	Bole	4	20	-	20	Farmers	Pump operated
Other small holders	Akaki		119.6	100	497	597	Farmers	Surface irrigation
Total			389 .6	441	1133	1574		

Addis Ababa City Agricultural Office (2002).

Table 3. Improved vegetable seed recommended for irrigation schemes for the study area.

Vegetable	Improved variety	Seeding rate (kg/ha)	Price (birr/kg)	Total price (birr/ha)
Potato	Tollcha	1500-2000	2.75	4125
Tomato	Marglov, money maker, Roma.VF	0.22	490	107.8
Carrot	Nantes	3.6	176	792
Onion	Red croyale	3.5	260	910
Pepper	Marecofana	0.6	30	18
Beet root	Detroit dark red	16	150	2400
Cabbage	Copenhagen	0.4	400	160
Lettuce	Great Leakes mesa	1.7	180	306
Leek		3.5	200	700
S. Charade	Ford hook giant	15	185	2775
Kale	Zkuala or local Guraghe	0.4	40	16
Cauliflower	Snow ball or Glacier	0.4	350	140

Table 4. Crop water Requirement for Vegetable growers in Addis Ababa sub-catchments of Upper Awash Basin.

Crop	Season	ET _o (mm)	ET _c (mm)	Rainfall _a (mm)	Rainfall _e (mm)	Net _{irreq} (mm)	Field _{irreq} (mm)	Aapp _{irrho}	Irr _{inter}
Potato	1	515	422.3	68	65.7	356.6	606.2	20	6
	2	542	450.8	274	241.5	209.3	355.8	12	10
Tomato	1	515	397.1	68	65.7	331.4	563.4	11	11
	2	542	423.8	274	241.5	182.3	309.9	6	20
Carrot	1	515	348.5	68	65.7	300.3	510.5	10	9
	2	542	370.4	274	241.5	203.8	346.4	7	13
Onion	1	515	490.7	68	65.7	344	384.8	19	6
	2	542	438.4	274	241.5	196.9	334.7	11	11
Pepper	1	515	408.7	68	65.7	343	583.1	12	6
	2	542	438.3	274	241.5	196.8	334.6	7	11
Beets	1	515	321.5	68	65.7	273.3	464.6	9	6
	2	542	345.6	274	241.5	179	304.2	6	11
Cabbage	1	515	461.9	68	65.7	396.2	673.5	22	8
	2	542	429.1	274	241.5	187.6	318.8	11	14
Lettuce	1	515	342.2	68	65.7	294	499.7	17	5
	2	542	363	274	241.5	196.4	333.9	11	8
Cucumber	1	515	351.7	68	65.7	286	486.2	10	6
	2	542	375.1	274	241.5	133.6	277	5	11
Leek	1	515	293.9	68	65.7	228.2	387.9	13	6
	2	542	288.2	274	241.5	67.6	114.9	4	11
Swiss Charde	1	528	260.4	171	153.6	209.7	356.5	12	9
Kale	1	515	461.9	68	65.7	396.2	673.5	22	8
	2	542	429.1	274	241.5	187.6	317.8	11	14
Pumpkin	1	529	244.2	171	153.6	193.5	329	11	16
Cauliflower	1	515	449.3	68	65.7	383.6	652.1	22	6
	2	542	464.9	274	241.5	223.4	379.7	13	11
Phaseolus	1	515	390.8	68	65.7	325.1	552.6	18	6
	2	542	433.3	274	241.5	191.8	324	11	11

Table 5. Mean vegetable productivity under traditional irrigation schemes.

Vegetables	Cultivated Area (ha)	Cropping pattern (%)	Total production (qt)	Productivity (qt/ha)
Potato	48.7	12.5	9740	200
Tomato	15.03	3.85	2254.5	150
Carrot	45.9	11.8	9180	200
Onion	7	1.8	616	88
Pepper	5.75	1.48	172.5	30
Beet root	25.3	6.49	7590	300
Cabbage	32.57	8.36	9771	300
Lettuce	54.92	14.1	3295.2	60
Leek	16	4.11	1600	100
Swiss Charde	48.63	12.48	7294.5	150
Pumpkin	3.6	0.92	1440	400
Cucumber (Zikuni)	10.31	2.65	4124	400
Phaseolus	10.27	2.64	215.67	21
Kale	39.06	10.03	2343.6	60
Cauliflower	26.56	6.79	1567.04	59

Table 6. Labor and seed cost, value of crops and net incomes.

Vegetables	Labour cost (Birr/ha)	Seed cost (birr/ha)	Total cost (Birr/ha)	Productivi ty (qt/ha)	Losses (%)	Net production (qt/ha)	Market price (birr/ kg)	Total income (birr/ha)	Net income (birr/ha)	Feasibility ratio
Lettuce	915	306	1221	150	15	127.5	2	25,500	24,279	19.9
Swiss Charade	915	2775	3690	150	15	127.5	2	25,500	21,810	5.9
Carrot	1090	1056	2146	200	15	170	1	17,000	14,854	6.9
Cabbage	915	160	1075	300	15	255	1	25,500	24,425	22.7
Kale	915	16	931	60	15	51	2	10,200	9,269	10.0
Potato	960	4125	5085	200	15	170	1	17,000	11,915	2.3
Beet Root	1090	2400	3490	300	15	255	1	25,500	22,010	6.3
Tomato	1095	108	1203	150	15	127.5	1.25	15,938	14,735	12.2
Onion	1090	910	2000	88	15	74.8	2	14,960	12,960	6.5
Pepper	915	18	933	30	15	25.5	2.5	6,375	5,442	5.8
Leek	915	700	1615	100	15	81	2	16,200	14,585	9.0
Pumpkin	1200	1250	2450	400	15	340	1	34,000	31,550	12.9
Cucumber	1090	1250	2340	400	15	340	2	68,000	65,660	28.1
Phaslalus	1090	180	1270	21	15	17.85	2.5	4,463	3,193	2.5
Cauliflower	1090	140	1230	60	15	51	3	15,300	14,070	11.4
Total	15285	15394	30679	2609	225	2213.65	26.25	321,435	290756	

Table 7. Mean net income from the irrigation schemes.

Lettuce	54.92	24,279	1333402.7	± 200	2666805.36	141.2
S. Charade	48.63	21,810	1060620.3	± 100	1060620.3	56.2
Carrot	45.9	14,854	681798.6	± 200	1363597.2	72.2
Cabbage	32.57	24,425	795522.3	± 200	1591044.5	84.2
Kale	39.06	9,269	362047.1	± 200	724094.28	38.3
Potato	48.7	11,915	580260.5	± 200	1160521	61.4
Beet Root	25.3	22,010	556853.0	± 200	1113706	59.0
Tomato	15.03	14,735	221459.5	± 200	442919.07	23.5
Onion	7	12,960	90720.0	± 200	181440	9.6
Pepper	5.75	5,442	31291.5	± 200	62583	3.3
Leek	16	14,585	233360.0	± 200	466720	24.7
Pumpkin	3.6	31,550	113580.0	± 100	113580	6.0
Cucumber (Zukuni)	10.31	65,660	676954.6	± 200	1353909.2	71.7
Pha Seolus	10.27	3,193	32787.0	± 200	65573.95	3.5
Cauliflower	26.56	14,070	373699.2	± 200	747398.4	39.6
Total	389.6	290756	7144356.3		13114512.26	694.4

Table 8. Indicators for comparing performance of community based traditional irrigated of Addis Ababa sub-catchments in Upper Awash Basin.

	Output (Birr/ha)	Output per unit water consumed (Birr/m ³)	Output per unit irrigation supply (Birr/m ³)	Relative Water supply
Beet Root	44020	246.23	144.86	7.24
Cabbage	48850	272.53	160.34	6.90
Carrot	29708	270.50	159.13	7.45
Cauliflower	28140	123.13	72.44	6.98
Cucumber	131320	322.67	177.40	6.20
Kale	18538	124.03	73.04	6.90
Leek	29170	157.78	92.82	5.61
Lettuce	48558	543.80	319.80	7.39
Onion	25920	33.54	25.22	6.15
Pepper	10884	11.59	6.82	6.74
Phaslalus	6385	12.69	7.48	6.65
Potato	23830	205.08	120.64	6.83
Pumpkin	31550	58.70	34.52	8.55
Swiss Charade	21810	505.78	297.51	8.64
Tomato	29469	86.22	50.72	6.71
Total	528152	2974.275558	1742.740726	104.928489