

Socio-economic assessment of small scale irrigation schemes in Adami Tullu Jido Kombolcha Woreda, Central Rift Valley of Ethiopia

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Outline of the presentation

- Introduction
- Research objectives
- Research questions
- Study area
- Research methodology
- Results
- Conclusions and recommendations



Introduction

- Agriculture basis of Ethiopian economy
 - 45% GDP
 - 85% of export commodities &
 - 80% employment opportunities (Makombe et al., 2007).
- However, agriculture is largely based on subsistence farming
 - Low productivity
 - Food insecurity
- Govt. policy option: supporting dev. of SSIs
 - Rapid exposition of irrigated land
 - Only 75,000 ha in 1995 &
 - increased to 200,000 ha in 2003 (Diao and Ninn Pratt, 2007)
 - Additional 274,612 ha under irrigation until 2016
 - More than half of the irrigated land is under SSIs



Introduction (cont.)

- But the question is, are these small-scale irrigations on the right track to achieve the intended goal?
- According to Van den Burg and Ruben (2006) very little is known about socio-economic implications of irrigation development in Ethiopia
- Jansen et al., (2007) mentioned that sustainability of irrigated agriculture in CRV is being questioned, both economically and environmentally
- Therefore, there is a need to assess the socio-economic implications of small-scale irrigation development



Research objectives

- Assess changes in household's socio-economic characteristics before and after implementation of irrigation schemes.
- Analyze costs and revenues of four farm crops in two small-scale irrigation schemes.
- Identify the institutional arrangements for scheme management in the two irrigation schemes.
- Identify the transaction costs involved in irrigation scheme management



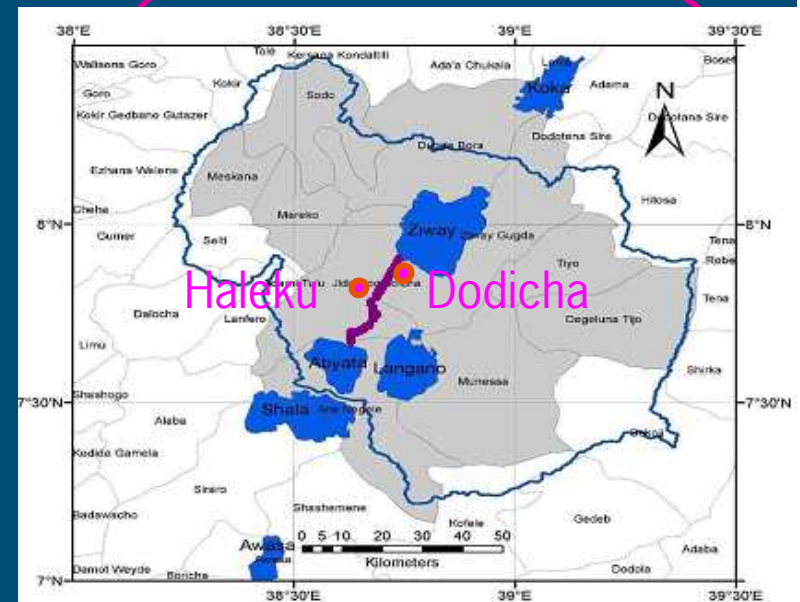
Research questions

- What are the changes in land holding size, livestock and farm implement holding before and after implementation of the irrigation schemes?
- What are the costs and revenues of small scale irrigation schemes in the study area?
- What are the institutional arrangements for scheme management?
- What are the transaction costs involved in irrigation scheme management?
- What measures are required to improve the performance of the existing irrigation schemes?



Study area

- CRV of Ethiopia covers 10000Km²
- Area under irrigation is estimated to 7500-10000 ha
- 31 SSIs
- two SSIs selected
- Lake, river and ground water are source of irrigation water



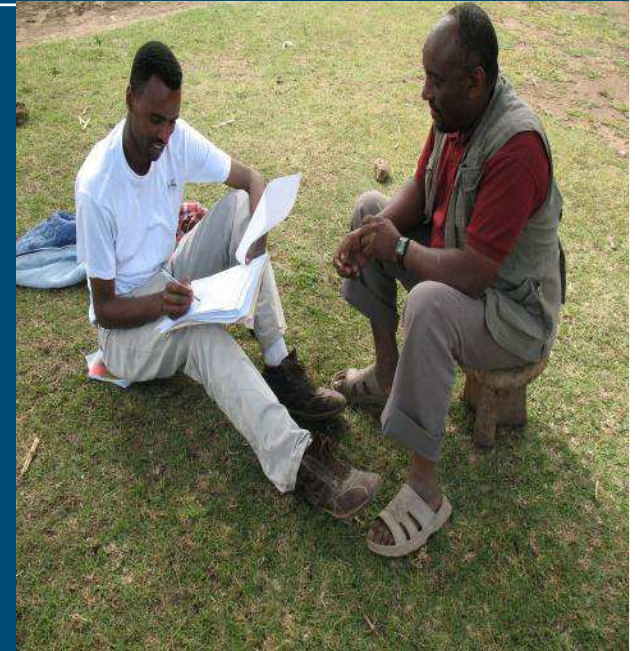
Description of selected schemes

Variables	Irrigation schemes	
	Haleku	Dodicha
WUA members	72	150
Scheme area	36 ha	75 ha
Started year	2001	2001
Supported by	NGO	Government
Source of water	Bulbula River	Bulbula River
Water abstraction	Pump	Pump
Method of irriga.	Furrow	Furrow
Major crops	onion, tomato, maize and green beans	onion, tomato, maize and green beans



Research methodology

- Household survey
 - 80 HHs (26 & 54 HHs from Haleku and Dodicha)
 - Structured questionnaires used
 - HHs survey covered:
 - ✓ Land holding size, Livestock and farm implement holding
 - ✓ Input use, yield, cropping intensity & water management issues
 - ✓ Households opinion about their income change and family food security conditions



Methodology (cont)

- Focus group discussions
 - 6 & 8 farmers Haleku and Dodicha,
- Key person interviews
 - WUAs, DAs, GOs and NGOs
- Field observations
- Literature
- Method of data analysis
 - NR, AP and APC calculated
 - SPSS was used for quantitative data analysis



Results Average livestock holding

What are the changes in land holding size, livestock and farm implement holding before and after implementation of schemes?

Type of livestock	Before scheme implementation (2001)	In 2007	Change in mean	Before scheme implementation (2001)	In 2007	Changes in mean
Cow	3.31	3.85	0.54	4.07	2.74	-1.33
Oxen	1.81	2.35	0.54	2.11	1.67	-0.44
Heifer	2.85	2.85	0	2.69	2.30	-0.39
Sheep	0.73	1.08	0.35	1.50	0.94	-0.56
Goat	2.88	3.96	1.08	4.81	3.30	-1.51
Donkey	0.85	0.96	0.11	1.03	0.95	-0.8
Poultry	4.54	4.31	-0.23	3.41	2.94	-0.47

Increased in Haleku and decreased Dodicha



Average land holding size

Ownership status	Haleku			Dodicha		
	Before scheme implementation (2001)	In 2007	Changes in mean	Before scheme implementation (2001)	In 2007	Changes in mean
Own land	2.67	3.16	0.49	1.47	1.13	-0.34
Rented in	0.06	0.01	-0.05	0.05	0.14	0.09
Rented out	0.49	0.36	-0.13	0.09	0.19	0.1

Increased in Haleku and decreased in Dodicha



Average farm implement holding

Type of livestock	Haleku			Dodicha		
	Before scheme implementation (2001)	In 2007	Change in mean	Before scheme implementation (2001)	In 2007	Changes in mean
Shovel	0.58	1.62	1.04	0.41	1.46	1.05
Folk	0.12	0.58	0.46	0.28	0.91	0.63
Donkey cart	0.35	0.88	0.53	0.23	0.46	0.23
Watering can	0.04	1.35	1.31	0.07	0.76	0.69
Sprayer	0	0.04	0.04	0.04	0.09	0.05
Sickle	1.31	1.85	0.54	1.39	1.43	0.04

Increased in both irrigation schemes



Average production costs (in birr/0.25 ha)

What are the costs and revenues of small scale irrigation schemes in the study area?

Type of crop	Schemes		Sig.
	Haleku	Dodicha	
Onion	2368	2341	NS
Tomato	2305	2270	NS
Maize	986	981	NS
Green bean	2264	2187	NS

NS= non significant, * significant at $P < 0.05$ ** significant at $P < 0.01$



Average crop productivity (in kg/0.25 ha)

Type of crop	Schemes				Sig.
	Haleku		Dodicha		
	Yield ranges	Mean yield	Yield ranges	Mean yield	
Onion	1000-6400	3462	500-6000	2379	**
Tomato	600-4200	2796	500-5000	2483	NS
Maize	200-4000	1416	200-2000	729	**
Green bean	1200-4900	2227	500-4200	1596	**

NS= non significant, * significant at $P < 0.05$ ** significant at $P < 0.01$



Net revenue of different crops (in birr/0.25 ha)

Crop type	Haleku		Dodicha		Sig.
	Revenue range	Net revenue	Revenue range	Net revenue	
Onion	1932-17246	8155	59-17089	5286	**
Tomato	535-10525	5941	79-11591	4789	NS
Maize	485-6497	1662	43-2510	649	**
Green bean	176-8180	2273	6-2849	1383	**

NS= non significant, * significant at $P < 0.05$ ** significant at $P < 0.01$

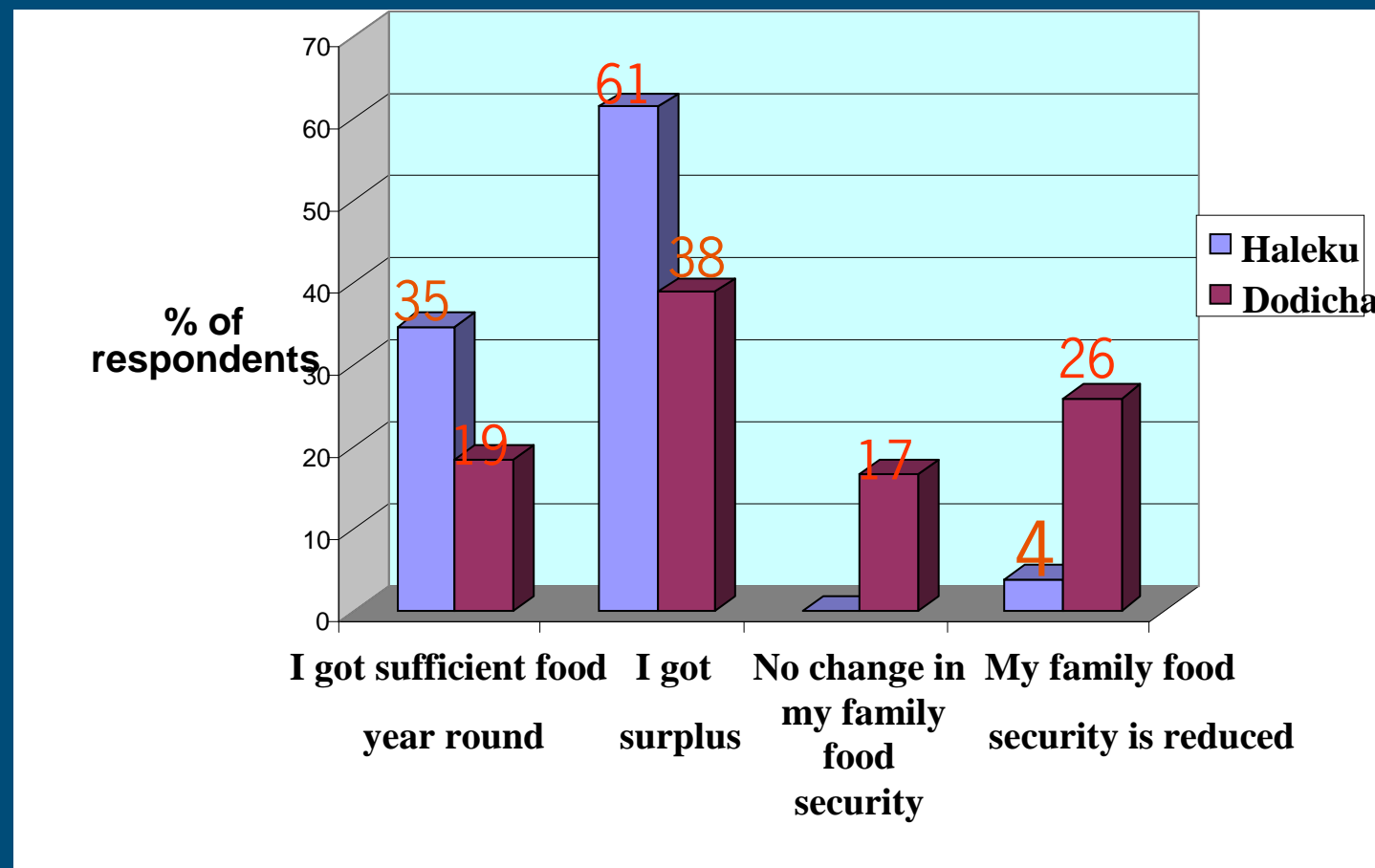


Loss ranges and net loss

Crop type	Number of farmers with loss		Loss range		Average loss	
	Haleku	Dodicha	Haleku	Dodicha	Haleku	Dodicha
Onion	0	2	-	254-398	-	376
Tomato	1	5	883	229-516	883	404
Maize	4	13	5-517	4-697	178	325
Green bean	0	9	-	168-828	-	472

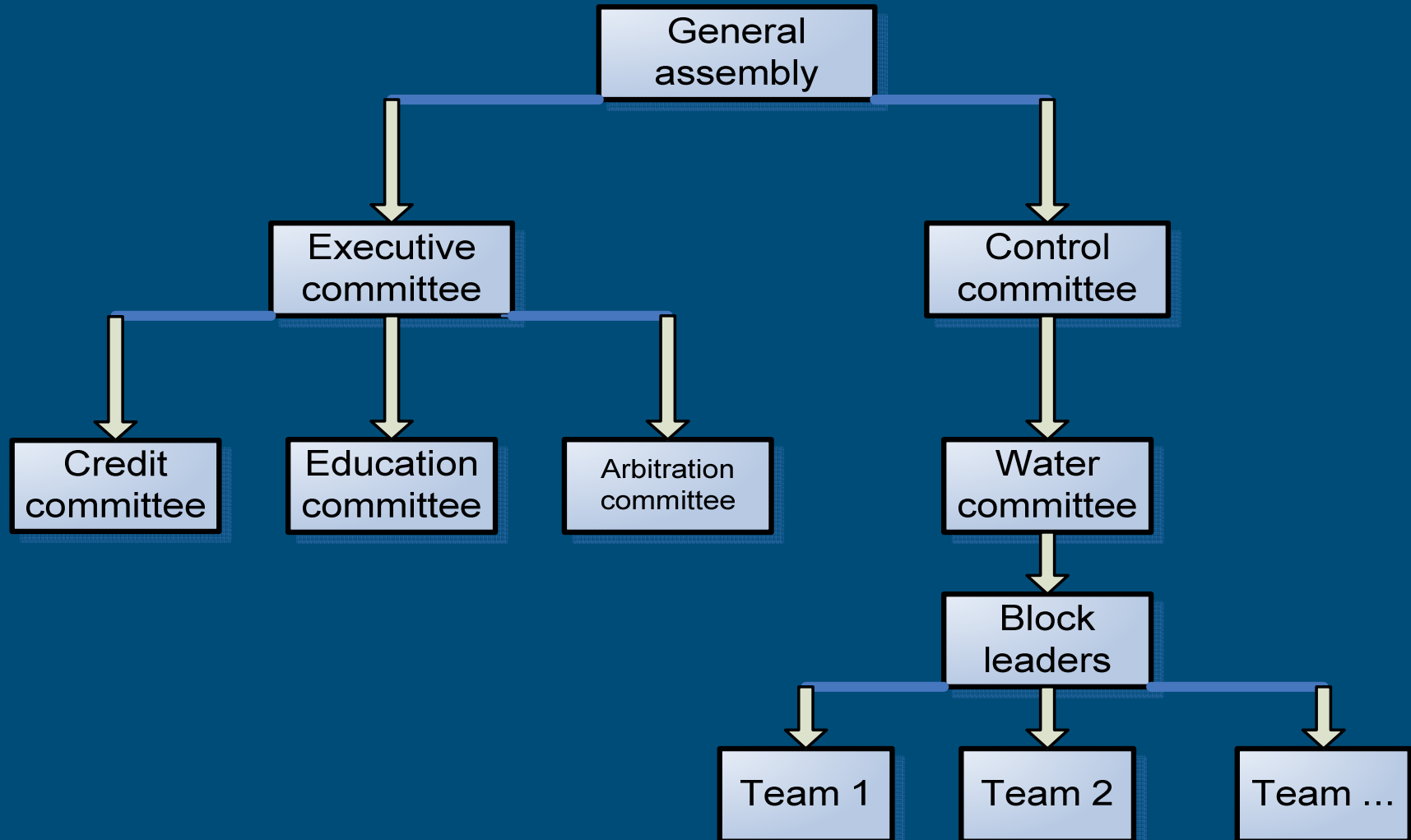


Household's food security perception



What are the institutional arrangements for scheme management?

Institutional arrangements for SSIs



Transaction cost

What are the transaction costs involved in irrigation scheme management?

- Costs of running the system (costs of coordination and monitoring scheme activities)
- Due to poor scheme management and coordination an higher in Dodicha
- The net revenue differences on onion, tomato, maize and green bean are 2869, 1153, 1013, and 890 birr/0.25 ha
- These differences could be taken as transaction costs due to poor coordination and management



Irrigation scheme management

- All management activities in the schemes are handled by WUAs committees
- 15 and 80% respondents in Haleku and Dodicha do not receive enough water, respectively
 - Regular pump failure,
 - poor scheme coordination and
 - lack of fuel are major reason for water scarcity in Dodicha
- 27 and 76% of respondents in Haleku and Dodicha had conflict with neighboring farmers or committee members, respectively



Major problems encountered by irrigation schemes

- Management problem
 - Poor performance of WUA committees
 - Regular pump failure (Dodicha)
 - Corruption (Dodicha) &
 - High transaction costs (Dodicha)
 - Poor crop management (Dodicha)



Major problems encountered by irrigation schemes

■ Institutional constraints

- Low level of extension services
- Lack of market information
- Absence or lack of credit facilities
- Absence of training services
- High cost of farm inputs



Conclusions

- Land holding size & no. of animals increased in Haleku
- Number of farm implements increased in both irrigation schemes.
- Net revenue ranges 7040-33298 birr in Haleku and 609-31040 birr in Dodicha.
- 96 and 57% respondents in Haleku and Dodicha mentioned their family food security condition has improved.
- WUAs committees are fully in charge of schemes management.
- The institutional performance has great impact
- Low level of transparency in financial issues and corruption resulted in lower economic performance in Dodicha.
- Lack of extension services, market information and training services are the major constraints in both schemes.



Recommendations

- Better training of farmers on agronomic practices, crop protection, book keeping, irrigation practices and marketing is required
- Institutions for input supply, output marketing and credit services should be strengthened or established to allow rapid progress
- Training, capacity building and encouraging DAs and WUAs committees are essential
- Regular supervision and monitoring is needed to improve transparency and prevent corruption.
- Further study is needed to investigate the high variation in crops revenue between farmers and schemes.



Thank you!



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