

**The Socio-Cultural Aspect of Irrigation Management:**

**The Case of Two Community-based Small-Scale Irrigation  
Schemes in the Upper Tekeze Basin**

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# The Problem

- Disregard of socio-cultural and institutional components,
- Lack of skills and institutions of irrigation management hinders efforts to improve livelihoods, and conflicts over access to water constrain smallholder farmers (ILRI, 2002).
- These conditions hold to the cases in the study area (Leul, 2003)

During a reconnaissance visit made on 14 schemes in the study area,

- problems in input and output market,
- gender related labour shortage at household level,
- conflicts over water distribution,
- and differential commitment of users to structure maintenance were observed to be prevailing in the management practices of the schemes.

## Objectives of the Study

- The general purpose of the investigation was to assess the socio cultural aspect of irrigation management in two community-based small-scale irrigation projects in the upper Tekeze basin while the specific research objectives were to:
  - Identify irrigation activities that entail problems in irrigation management performance;
  - Trace socio-cultural contexts that involve management problems in irrigation activities

# Research Questions

## General

- "How are irrigation practices managed in the two community-based small-scale irrigation schemes in the Upper Tekeze Basin?"

## Specific

1. What irrigation activities are entailing problems in irrigation management, and how?
2. What are the socio-cultural contexts affecting management of irrigation practices; and how do they affect them?

## Significance and Scope of the Study

The study has been believed to contribute to the attainment of :

- More efficient water utilization by the irrigators as a result of efficient and effective management practices;
- Mutually supportive crop-livestock production through reasonably integrated crop-livestock mixed farming systems management;
- Improved environmental and health conditions in irrigation systems;
- Increase in women's and poor farmers' access to irrigation benefits and supporting services; and

# ethodology

- **Study Design**

- Case study
- Exploratory
- Qualitative and quantitative research strategies

- **Data Collection Methods**

- i) Primary Data

- Key informant interview
    - Focus group discussion
    - Household interview survey

- ii) Secondary Data

## **Two Stages of Data Collection**

### **I.**

#### **Reconnaissance Visit**

- Secondary data review and collection
- Key informant interviews
- Focus group discussions

### **II.**

#### **Second Round Visit**

- Key informant interviews
- Focus group discussions
- Household Survey

# Sampling Design

## **Techniques: Purposive sampling**

- Scheme selection
- Key informants
- Focus group members

## **Two stage stratified sampling and random sampling**

- Households for survey

## Sampling Frame:

The list of irrigation users at each scheme:

1. First stratified by sex of household head
2. Secondly, they were categorized as 'higher,' 'middle' and 'lower' in terms of their socio-economic conditions.
3. Thirdly, a total of 50 irrigation user household heads (15 female and 35 male) were selected from each scheme through random sampling (the lottery) method. Thus, the total sample size was  $2 \times 50 = 100$ .

## Total sample size for household interview

Sex of Household Head		Socio-Economic Conditions			Total	
		Higher	Middle	Lower	N	%
Male		21	24	25	70	70%
Female		10	10	10	30	30%
Total	N	31	34	35	100	100%
	%	31%	34%	35%	100%	

## Instruments

1. Semi-structured questionnaire \_\_\_\_\_ for key informant interview
  2. Interview guide \_\_\_\_\_ for focus group discussion
  3. Structured questionnaire \_\_\_\_\_ for the household interview survey
- In addition, both the key informant interviews and the focus group discussions have been tape-recorded.

## Data Analysis

- Qualitative description and descriptive statistics
- SPSS program, \_\_\_\_\_ discussed using tabulation and cross-tabulation of variables with percentage values
- Most information from open-ended questions, key informant interviews, and focus group discussions \_\_\_\_\_ qualitative description.

## Theoretical and Conceptual Frameworks

- Some sociological theories
- Rationale for selection

### **Structural Models (Modernization and Neo-Marxist Theories)**

"Development and social change emanate primarily from centers of power in the form of intervention by state or international interests and follow some broadly determined developmental path, signposted by stages of development or by the succession of dominant modes of production" (Long and Ploeg, 1994:63). These models are tainted by determinist, linear and externalist views of social change.

## Ownership of irrigation structure as perceived by users

Responses	N	%
The government's	66	66 %
The Community's	16	16 %
The government and the community's	17	17 %
Non-response	1	1 %
<b>Total</b>	<b>100</b>	<b>100%</b>

## Parts of scheme users participate in maintenance

Responses	N	%
On my own plot and on canals leading to my field	76	76 %
At any point of damage in the scheme	14	14 %
Non-response	10	10%
<b>Total</b>	<b>100</b>	<b>100%</b>

*No body responsible for desilting the sediment deposit*

## The Actor- Oriented Paradigm

- All forms of external intervention necessarily enter the existing life-worlds of the individuals and social groups affected and in this way, are mediated and transformed by these same actors and local structures.
- Applied to the understanding of agrarian change, farmers are not passive receivers of planned change. They try to bring in their own interests so that they might benefit from, or, if need be, modify intervention by outside groups (Long and Ploeg,1994).

## The socio-Technical Approach

- “Irrigation systems are socio-technical systems, which embrace both social and technical systems components and subsystems” (Huppert, 1982:27).
- Not only mediate people’s relationships with biophysical processes.

The three concepts comprising the social dimension of irrigation

i) **Social Requirements For Use** - management structure

ii) **Social Construction** – a) different stakeholders interact

b) perceptions and interests have roles in  
shaping the technical characteristics

(Mollinga, 2003.: 19).

iii) **Social Effects** – positive or negative consequences

## Analytical Frame

Based on the Actor-Oriented Paradigm and the Socio-Technical Approach, the analytical frame employs the definition of ‘irrigation management’ in the organizational sense.

“Irrigation management ... in the organizational sense,..., is about the regulation and control of human behaviour, particularly with regard to the forms of cooperation necessary to make irrigation systems function,” (Mollinga, 2003:36). Thus, irrigation activities and conditions of possibilities (contexts), which are related to the organizational human behavior in terms of irrigators in the study schemes and their immediate environment, are concerns of assessment. They include construction, operation, maintenance, water allocation, water distribution, decision- making, resource mobilization, conflict management, market, labour, land, supporting services, inputs and outputs, gender, ethnicity, religion, development NGOs and local institutions.

## Major findings

- ❖ Irrigation activities entailing major problems in managing the socio-cultural issues in the two study schemes are operation, maintenance, water allocation, water distribution, decision-making and conflict management.
  - Perception of scheme ownership, head-end /tail-end position of land, and weak enforcement of collective action rules are affecting irrigators' commitment to structure maintenance.

## **Water is not allowed for supplementary irrigation.**

- There exist attempts of water distribution breaches. These include detaining water at one's self plot, Abbo-mai's taking away of water from someone's field before the required rate is met, or giving water to some irrigators out of their turns, and irrigators' over-irrigating of fields.
- That users pay a uniform charge without taking the amount of water into consideration, and the weaknesses in enforcing rules of water distribution breaches are causing lack of incentive for efficient use of water.
- Due to socio-economic and cultural factors, some landholders in the schemes are forced to decide to lease out their irrigation plots instead of producing themselves

*In the previous table, we have identified that the total number of respondents who hire or give out irrigation plots for sharecropping or who do both is 23. Out of the 23, 12 are male household heads whereas 11 are women. This means that 17.1 % of male-headed households and 36.7% of female-headed households lease out their irrigation plots.*

*As a result, inequality (income disparity)*

\* Income disparity could be also widening, even worse, between the farmers who have been cut off because of water shortage and their tail-end land positions and the farmers who are continuously using irrigation.

- Co-SAERT experts' Promises at the beginning
- On top this, socio-technical factors

- These differences between beneficiaries and non-beneficiaries are causing adverse **social effects**.
  - ✓ Resentment for irrigation
  - ✓ Negative attitudes → especially to those who are from other communities
  - ✓ Conflicts with the government bodies.
- There is a considerable struggle undergoing between household livelihood strategies in the mixed farming system and the government priorities for irrigation production in the schemes. The priorities in the cropping pattern diverge away

## Crop types proposed for dry season irrigation production and their percentage area coverage

Crop Type	Percentage of Area Coverage
Onion	25
Pepper	20
Cabbage	10
Tomatoes	20
Maize	15
Field peas	10

Source: Soils and Agronomy Feasibility Study Report (CoSAERT, 1999)

## Users' discretion in choosing the crop types to be planted and the size of land to be devoted to them

Responses	N	%
I am free to choose	69	69 %
I am not free to choose	31	31 %
Total	100	100 %

This and other farmers' decisions dominated — not performing up to their government objectives

## Comparison between the actual cropping pattern (this year) and that recommended by project designers

Site	Total area irrigated at present (in ha.)	Crop type	Area coverage at present (in ha)	% out of total area irrigated at present	% of recommended area	Difference %
Gum-Selasa	40.2	Maize	28.6	71.14	15	+ 56.14
Gum-Selasa	40.2	Onions	9.6	23.9	25	- 1.1
Gum-Selasa	40.2	Garlic	0.4	0.99		
Gum-Selasa	40.2	Tomatoes	0.8	1.99	20	- 18.01
Gum-Selasa	40.2	Cabbage	0.15	0.37	10	- 9.63
Gum-Selasa	40.2	Lettuce	0.05	0.12		
Gum-Selasa	40.2	Chick peas	0.2	0.49		
Gum-Selasa	40.2	'guayya'	0.2	0.49		
Gum-Selasa	40.2	Barley	0.2	0.49		
Mai- Nigus	51.2	Onions	9	17.57	25	- 7.43
Mai- Nigus	51.2	Garlic	2.35	4.59		
Mai- Nigus	51.2	Pepper	8.15	15.92	20	- 4.08
Mai- Nigus	51.2	Tomatoes	2.975	5.81	20	- 14.19
Mai- Nigus	51.2	Lettuce	0.175	0.341		
Mai- Nigus	51.2	Broccolis	0.225	0.439		
Mai- Nigus	51.2	Carrot	0.175	0.341		
Mai- Nigus	51.2	Cabbage	0.075	0.146	10	- 9.854
Mai- Nigus	51.2	Potatoes	0.025	0.048		
Mai- Nigus	51.2	'abesh'	1.7	3.32		
Mai- Nigus	51.2	Maize	25.8	50.39	15	+ 35.39
Mai- Nigus	51.2	Chick peas	0.55	1.074		

- The extension workers summarized the factors determining resistant cropping pattern decisions:
  1. Accessibility of seed
  2. Less labour demand
  3. Drought resistance quality (risk aversion)
  4. Usability for household consumption
  5. Usability for livestock feed
  
- Serious conflicts between head-enders and tail-enders over water share, conflicts over the 22-day /year free labour between irrigators and government bodies, conflicts between non-irrigators and irrigators as well as non-irrigators and the government over adverse effects of newly emerged birds and malaria; and conflicts between users and Abbo-mai as well as among the users themselves are major types of adverse **social effects** which always prevail without efficient attempt to manage them.
  
- ❖ The socio-cultural contexts affecting management practices are land rights, labour linked with gender and religion, supporting services, market and local institutions. Irrespective of the lifelong land use right certificate, some are still suspicious.
  
- Not caring for the improvement of land productivity

**User's feelings concerning whether they believe that they would maintain their land under their/their families' title throughout their lives.**

<b>Responses</b>	<b>N</b>	<b>%</b>
Yes	62	62%
No	37	37%
Non-response	1	1%
Total	100	100%

**Source: Household Survey**

A serious land rights problem exists in Gum-Selasa.

Feeling: irrigation has been introduced for the benefit of the urban elite on the expense of the indigenous people.

- ✓ Competition for labour and its shortage: Prevalence of malaria in Mai-Nigus
- Soil and water conservation work —→ 22 day's time every irrigation season
- The Ethiopian Orthodox Christian observances of Saints', Angels' and Martyrs' days render irrigators labourless for 5 – 11 days/month at household level.
- Female-headed households —→ short of man labour
- Traditional labour aid practices
- Less coverage of irrigation training, high prices and inadequate provision of inputs, non-use of credit services, absence of saving habits and lack of storage facility
- Though many irrigators have financial needs for input purchase and labour hiring,
- They feel the interest rate is high; they are unable to secure the collateral; the group loan system is unsuitable; and they fear the risks with repayment.

- Output market

*Unorganized marketing, low price of output and harassment from government tax collectors(in the case of Mai-Nigus) create problems.*

- Actors in irrigation management as local institutions : water committee, extension workers, 'tabia' administration, community court, and the Woreda Agricultural Offices

*Neither the Water Committee nor the Community Court is with strong performances of enforcing collective action rules and regulations as formulated.*

- The task of water allocation is performed by Woreda Agricultural Offices and extension workers.
- The decision regarding the proportion of water and irrigable area is not based on technical recommendations of experts

## Co-SAERT's Estimation of Irrigable Land and irrigated land in Gum Selassa

Year	Estimated irrigable Land (ha.)	Irrigated land (ha.)	Not irrigated land in percentage	No.of plot holders of not irrigated land
1996/97	110	16	85.5	470
1998/99	113	8.6	92.2	507
1999/00	83	64.6	22.2	92
2000/01	85.5	69.4	18.8	80.5 [sic]
2001/02	85.5	79.9	6.5	28
2002/03	121	86.2	21.6	119

**Source: CoSAERT and Hintalo Wajirat Agriculture Department in Woldeab(2003: 98)**

- The extension workers and the Woreda Agricultural Offices help the irrigated system technically, but these institutions are also sources of harassment in irrigation production.
- The water committee is too incapable to manage all issues in the socio-cultural aspect of irrigation management. Essential issues like input and output marketing management, head end/tail-end conflict minimization works, controls of efficient water use tasks are vacant presently

## Recommendations

Based on the findings of the study, the following recommendations are given.

1. Formal water users' associations
2. Reform in the government priorities of irrigation
3. Targeted credit service intervention
4. Promote traditional labour aid practices like 'wofera' and 'rofedit'
5. Minimize the negative impacts of religious practices on labour availability
6. A proper and immediate measure to overcome the problems caused by newly emerged birds and malaria
7. Consider the labour demand of irrigation systems during the plan for the 22-day free labour of soil and water conservation work
8. Endeavors to construct concrete canals
9. Presently, help the communities with removing the sediment in the reservoir dams

## Users' experience in practicing irrigation all dry seasons as long as water is available seen in relation with household head type

Household Head Type		Responses				
		1. Yes, I do	2. No, I some times hire out my plot	3. No, I some times exercise share cropping	2 & 3	Total
Male with higher socio-economic conditions	N	20			1	21
	%	95.2%			4.8%	100%
Male with middle socio-economic conditions	N	19	1		3	24
	%	79.2%	4.2%	4.2%	12.5%	100%
Male with lower socioeconomic conditions	N	19		5	1	25
	%	76%		20%	4%	100%
Female with higher socio-economic conditions	N	7		2	1	10
	%	70%		20%	10%	100%
Female with middle socio-economic conditions	N	6		1	3	10
	%	60%		10%	30%	100%
Female with lower socio-economic conditions	N	6		2	2	10
	%	60%		20%	20%	100%
Total	N	77	1	11	11	100
	%	77%	1%	11%	11%	100%

Source: Household Survey

## Out leasing users' reasons for hiring or giving out irrigation plots for sharecropping even when water is available

Household Head Type		1.Shortage of labour	2.Problem of ox/oxen	3. Presence of other source of household income	1 and 2	Total
Male with higher socio-economic conditions	N		1			1
	%		100 %			100 %
Male with middle socio-economic condition	N		3		2	5
	%		60%		40 %	100 %
Male with lower socio-economic conditions	N		1	1	4	6
	%		16.7 %	16.7 %	66.7 %	100 %
Female with higher socio-economic conditions	N	1			2	3
	%	33.3 %			66.7 %	100 %
Female with middle socio-economic conditions.	N	1	3			4
	%	25 %	75 %			100 %
Female with lower socio-economic conditions.	N		2		2	4
	%		50 %		50 %	100 %
Total	N	2	10	1	10	23
	%	8.7%	43.5 %	4.3%	43.5 %	100 %

Source: Household Survey