Community-based irrigation management in Ethiopia: *Strategies to enhance human health, livestock and crop production, and natural resource management*

The Tekeze River Basin case study

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Goals

- To improve the livelihoods of poor farmers in Ethiopia through better management of irrigation systems to improve human health, reduce poverty and better manage natural resources

- To consider “livestock-water interactions”

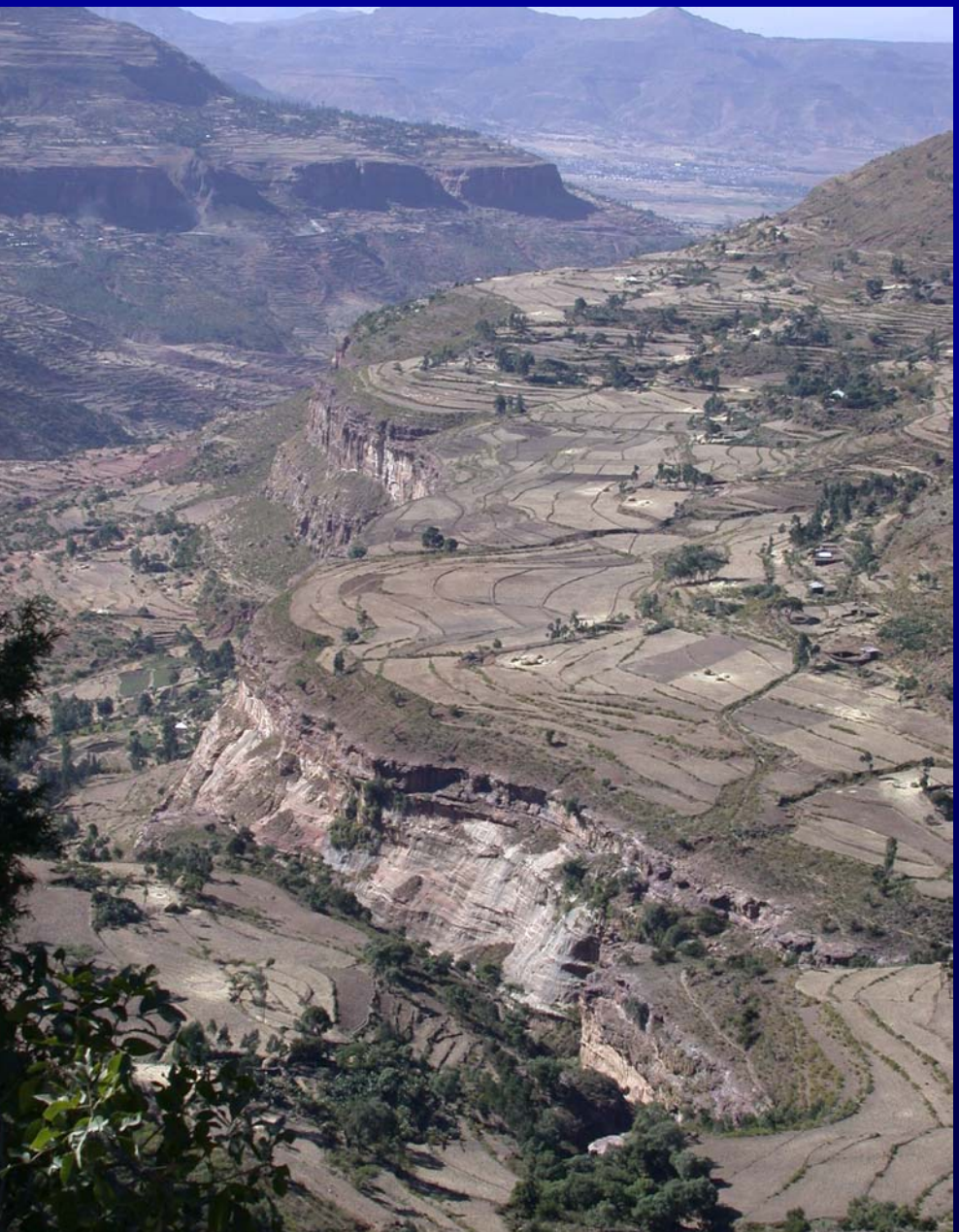
Why Livestock?

- Major asset & part of agricultural GDP
- Water for drinking
- Water for feed
  - 100 times more than drinking/head
- Contamination of water
- Overgrazing promotes sedimentation
- Animals often have access to water but excluded from catchment

Location of the Study Sites

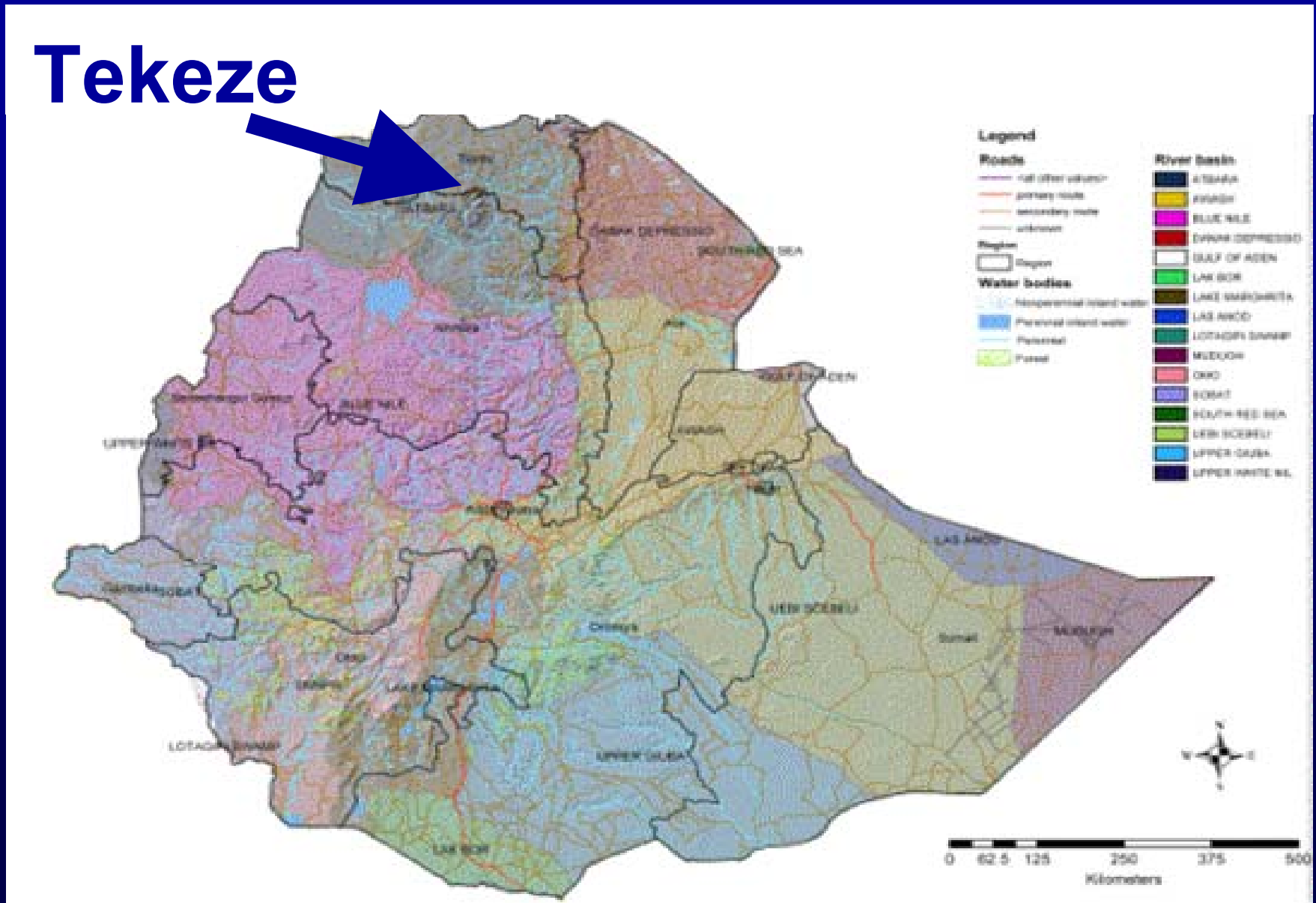
- The project: Awash & Tekeze basins
- Focus now: the Tekeze
- Three small micro earth dams: Korir, La'elay Wukro, and Mai-Nigus
- 150 households surveyed
- Evaluation method "before/after"
- Descriptive statistics for this presentation
- Preliminary results

Tekeze River Basin

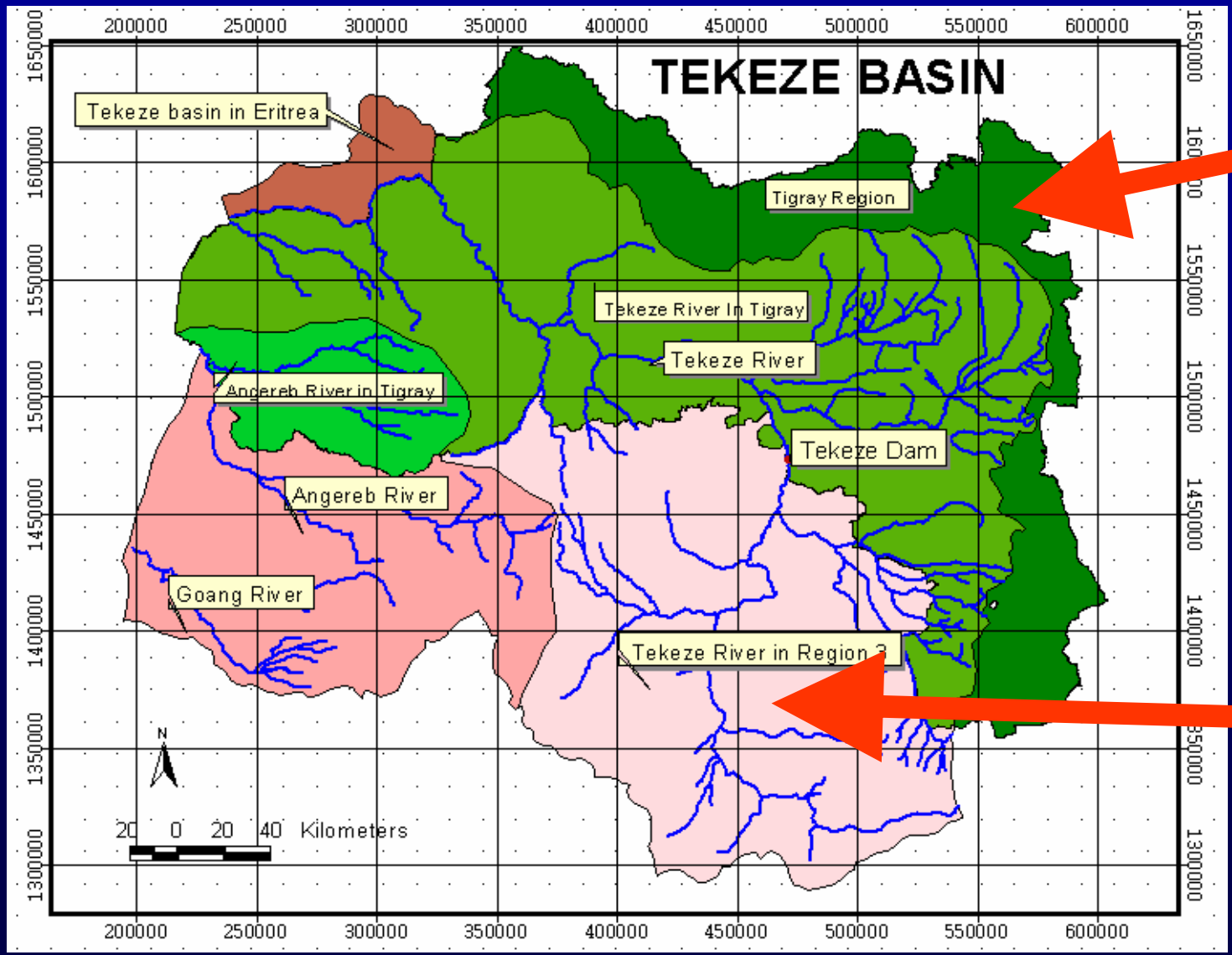


- Often rugged terrain
- Severe land degradation
- Mostly rainfed agriculture
- Terracing common to control run-off & erosion
- Some “closed” areas to restore vegetative cover

Major River Basin of Ethiopia



Tekeze River Basin



Tigray

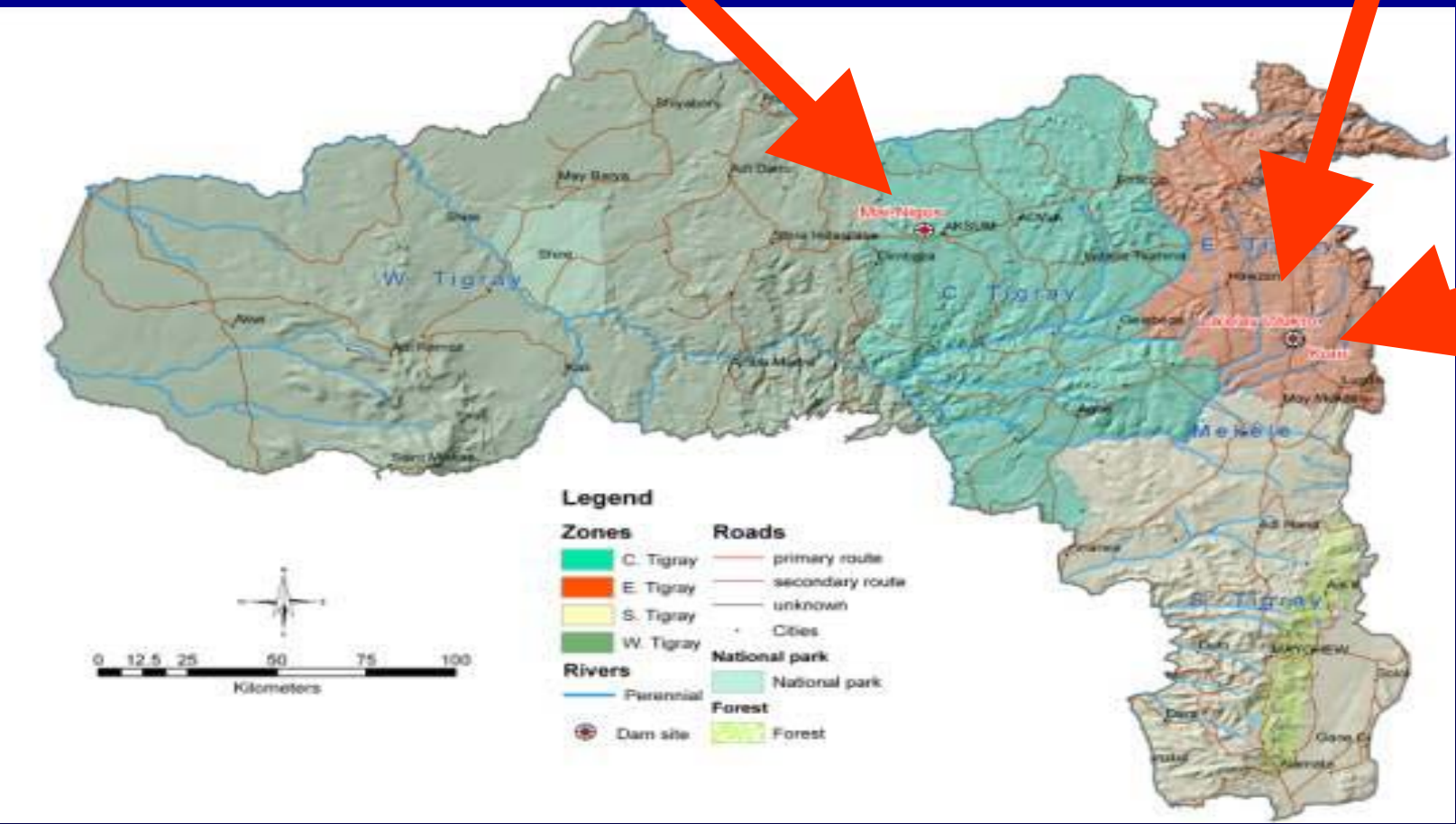
Amhara

Small Micro Dam Sites

Mainigus Dam

Laily Wurkro Dam

Korir Dam



Tekeze River Basin

- Area = 86510 km^2
- Source near Lalibela
- Flows to Sudanese border
- Predicted population (2045) = 17.3 million
- Grazing & browsing animals = 3.7 million
- 3 micro-dams
  - Catchment approximately 15 km^2
  - Command area approximately 1 km^2

Tekeze River Basin

Korir Dam

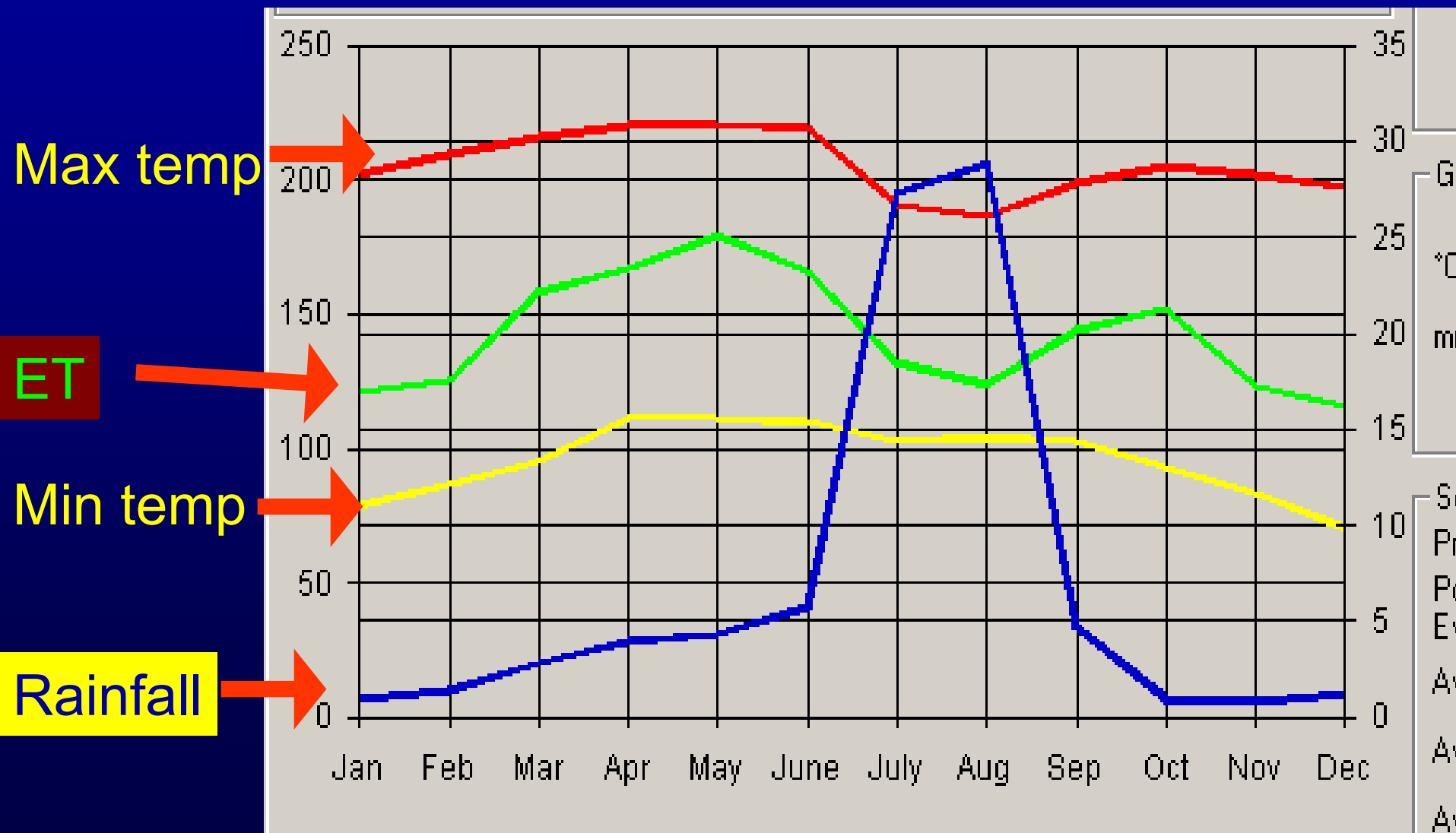
1. Irrigation water out let
2. Part of the reservoir
3. Part of the reservoir

Tekeze River Basin

Laily Wurkro

Dam in association with livestock

Tekeze River Basin – Laily Wukro



Tekeze River Basin

Mainigus Dam

1. The Reservoir & part of catchment
2. The down stream irrigation fields.

The farmers keeps cattle at home, but feed is piled in command area.

Preliminary Results

Livestock Population

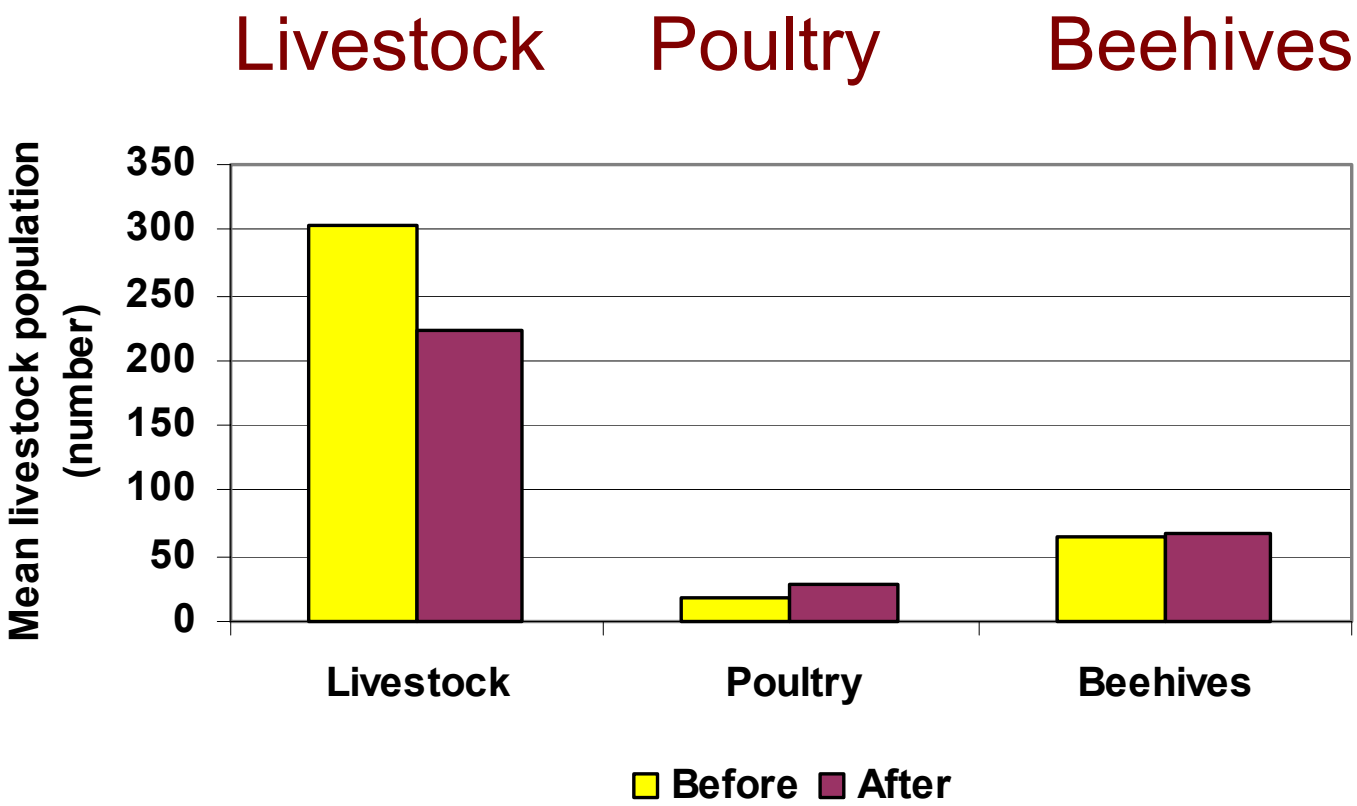


Figure 2. Impact of community based irrigation development on livestock , chicken and honey beehives.

Preliminary Results

Crop Residues (days/cattle)

724 After

598 Before

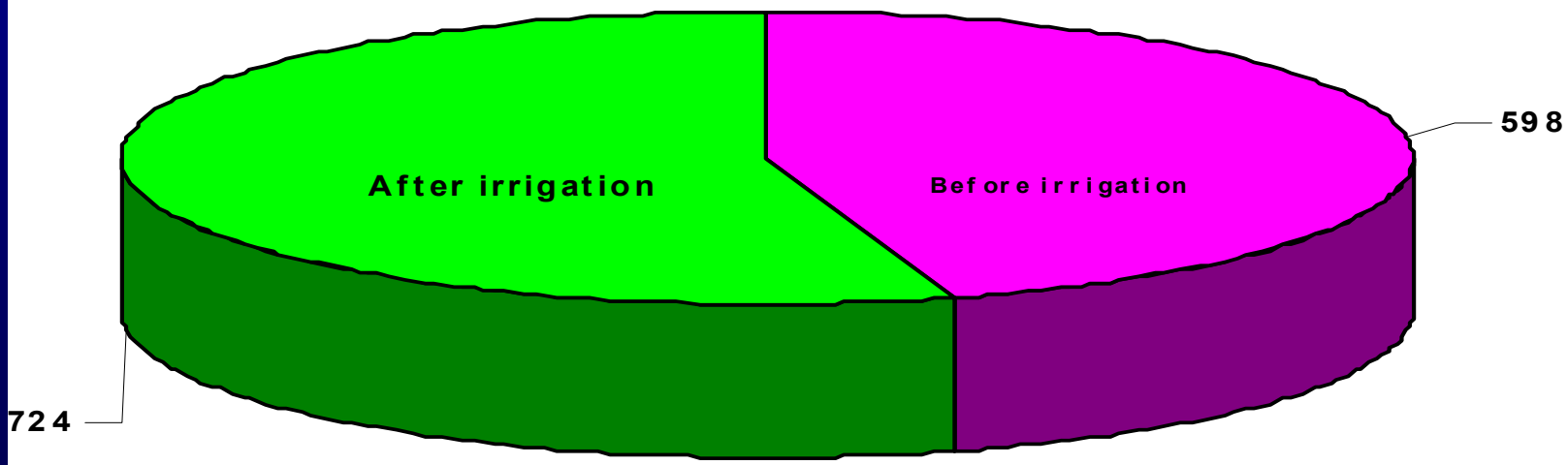


Figure 3. impact of irrigation on avaiability of crop residues in days/ cattle.

Preliminary Results

% of households reporting constraints to livestock feed availability

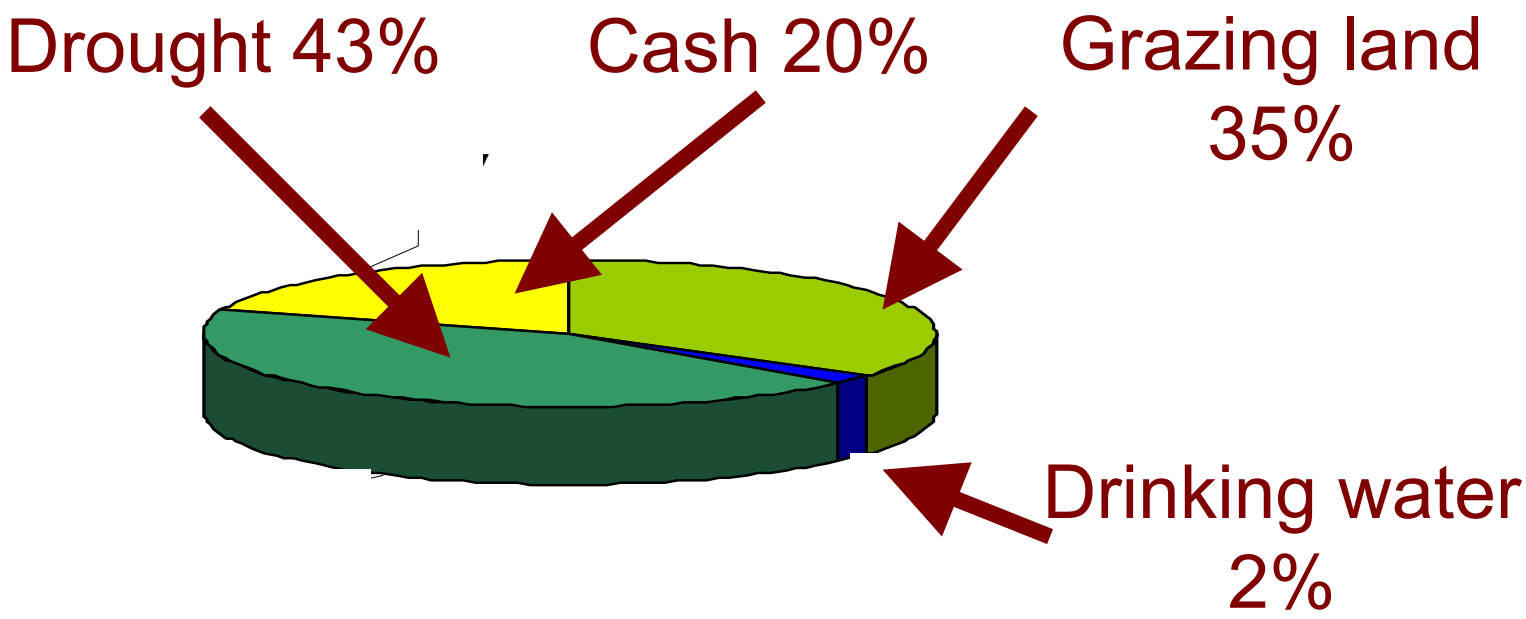


Figure 4. Level of constraints after irrigation development.

Preliminary Results

% of Year with Food Self-sufficiency

After 62% Before 38%

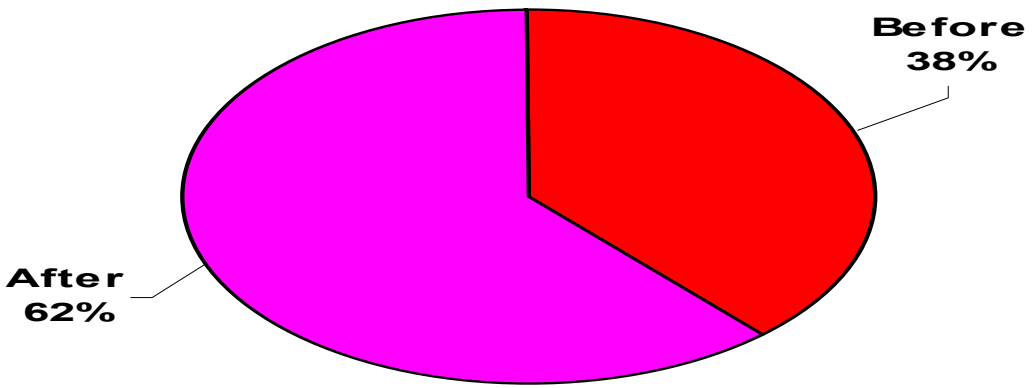


Figure 5. Months of food self sufficeincy before and after community based irrigation was intoroduced.

Preliminary Results

Impact on local human labor (Birr/day)

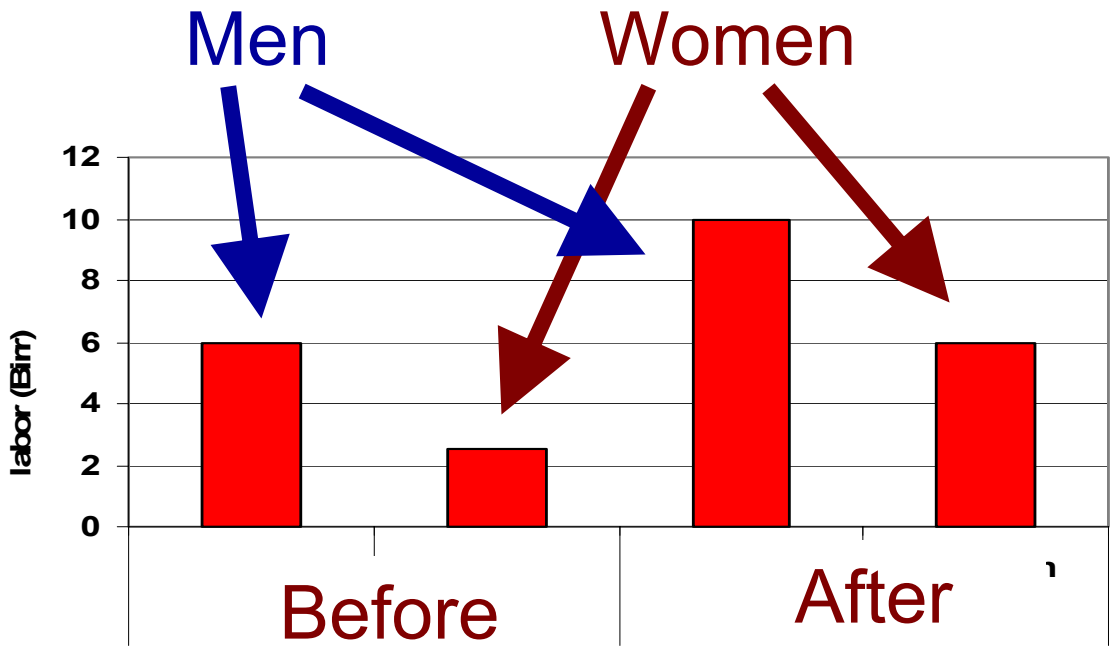
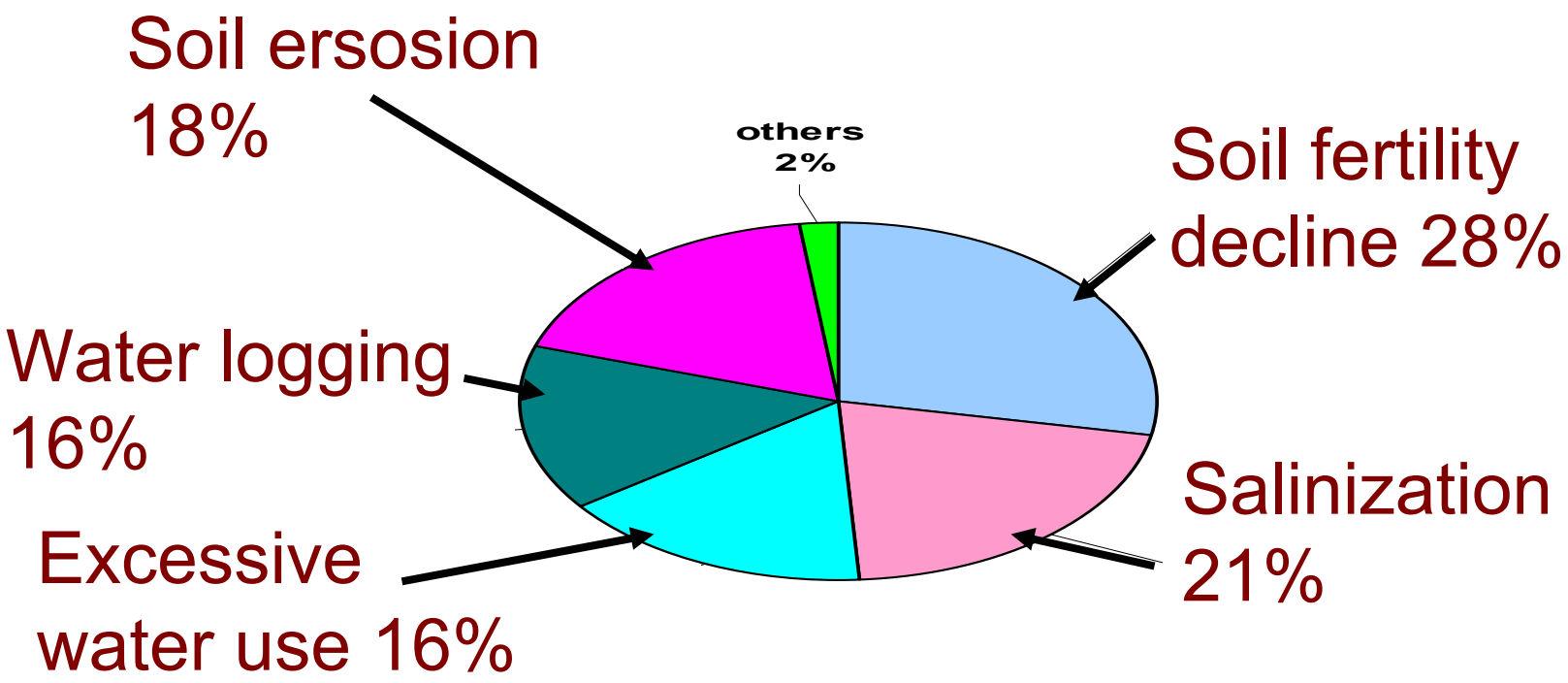


Figure 6. Impact of cmmunity irrigation development on local labor before and after irrigation communut irrigation dvelopment.

Preliminary Results

Impact on Environmental Change



Preliminary Results

Household Income

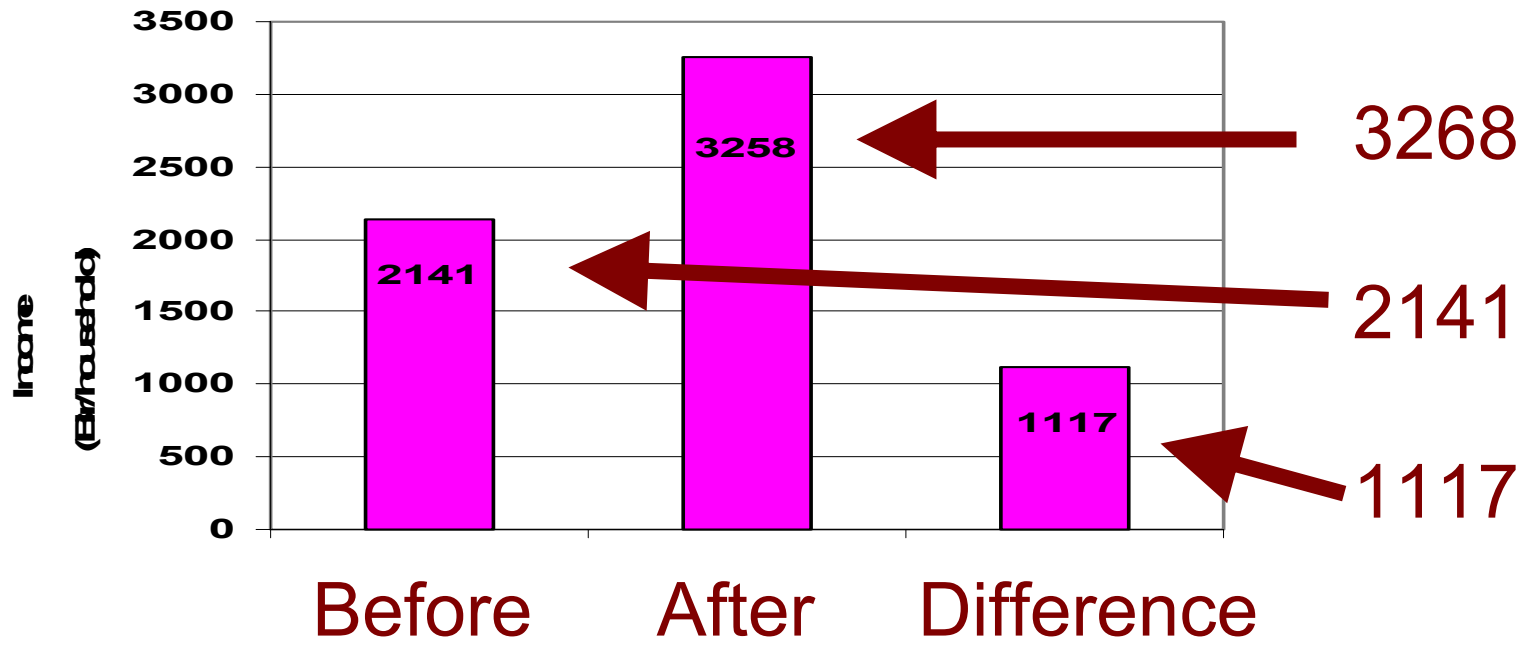


Figure 8. Impact of community irrigation development on average annual income (Birr/household).

Summary of Preliminary Results

- Ruminant animals declined after irrigation
- Irrigation increased feed & food security, but communities are not food secure year-round
- Household income increased by about 50%
- Labour income increased especially for women
- Environmental degradation may threaten sustainability of system
- Improvements to system possible, but more holistic indicators of performance needed
- Many questions still to be answered

Thank You