

Animal power, a cheap alternative for the construction of reservoirs in Ethiopia?



Abiye Astatke, Kai Sonder, Don Peden and Girma Tadesse

Background

Water is a limiting factor in Ethiopia due to erratic rainfall and insufficient storage systems

Use of heavy machinery expensive

Ox population approx. 14 Million

Oxen are used almost exclusively for soil cultivation

15% of annual feed amount used for actual work, the main part is just used for maintenance

Training of oxen takes one year at the age of two

Useful working life lasts only 4-5 years

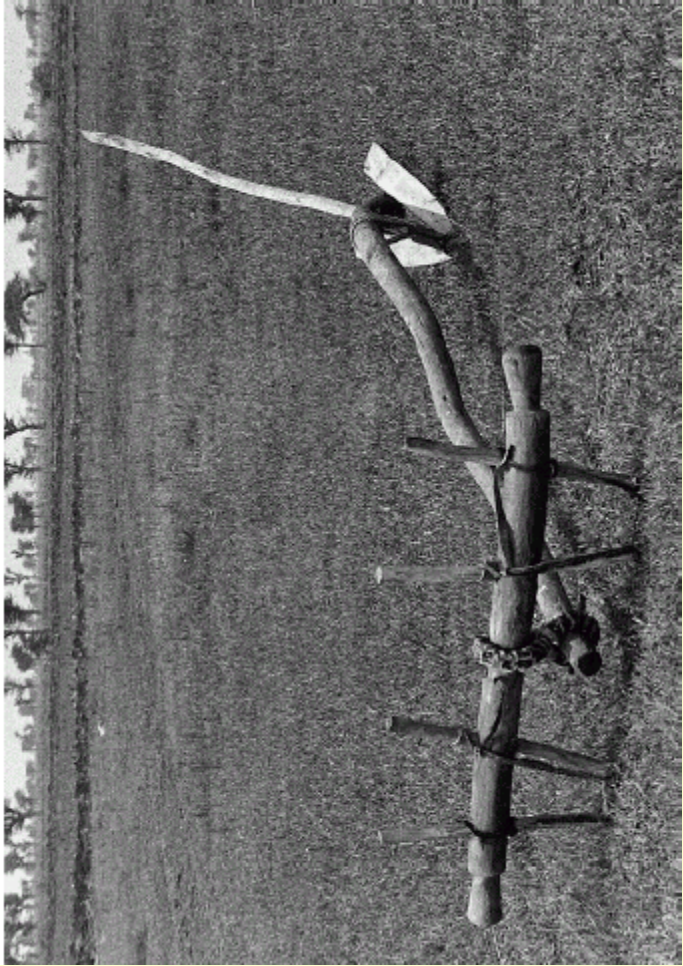
Past experiences

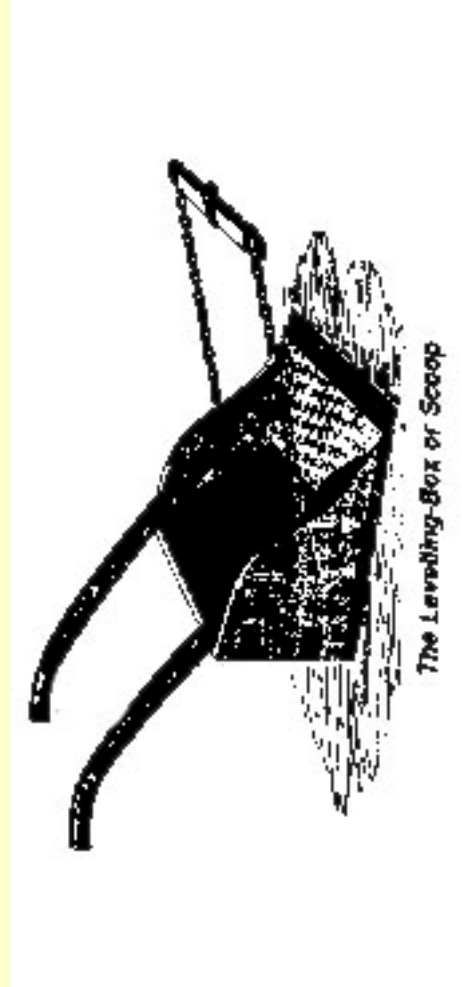
In 1985 the Peasant Associations Kormagefia and Faji & Bokafia near Debre Birhan built reservoirs

All oxen-owners in PAs had to participate

Even those who did not benefit from the reservoirs

PA's executive committee set fines for absentees and latecomers





The Leveling-Box or Scoop

Ponds constructed in 1984/85

Kormargefia

148 oxen pairs total

7 groups of 21 oxen pairs

Once every 9/10 days

Capacity 9,500 m³

Pond size 60 by 60 m

140 m circuit length

79 days 12/84-03/85

Working day 6.5h

6.6 m³ per oxen-pair per day

Faji&Bokafia

93 oxen pairs total

5 groups of 18 oxen pairs

Once every 6/7 days

Capacity 8,700 m³

Pond size 40 by 80 m

200 m circuit length

76 days 12/84-03/85

Working days 5.9 h

7.0 m³ per oxen-pair per day

Benefits

- Water availability for households throughout the year
- Improved livestock production
- Time and labour for water transport reduced
- Higher water availability for vegetables and homegardens
- Improved hygiene due to better access to water
- Potential for pisciculture (Tilapia)
 - Water harvesting and runoff reduction
 - Animal power used not only for land preparation
 - Second harvest possible even without belg rains
- Better recharge of groundwater and springs
- Additional water available (biogas etc)

Constraints

Changed socio-political conditions

Community organisation

Enough feed available

Higher feed input (aprox. 2kg per ox per day)

Oxen in decent shape

Availability of land

Soil type appropriate

Current Implementation Conditions

- Water is a major constraint in the area
- Community is aware and willing to participate
- No more than 30 households will participate
- Distance between reservoir and households less than 1 km
- More than 15 pairs of oxen available
- Farmers without oxen are willing to participate in other forms
- Reservoir capacity 1,500-3,000 m³, 600 m², depth 3.5 m



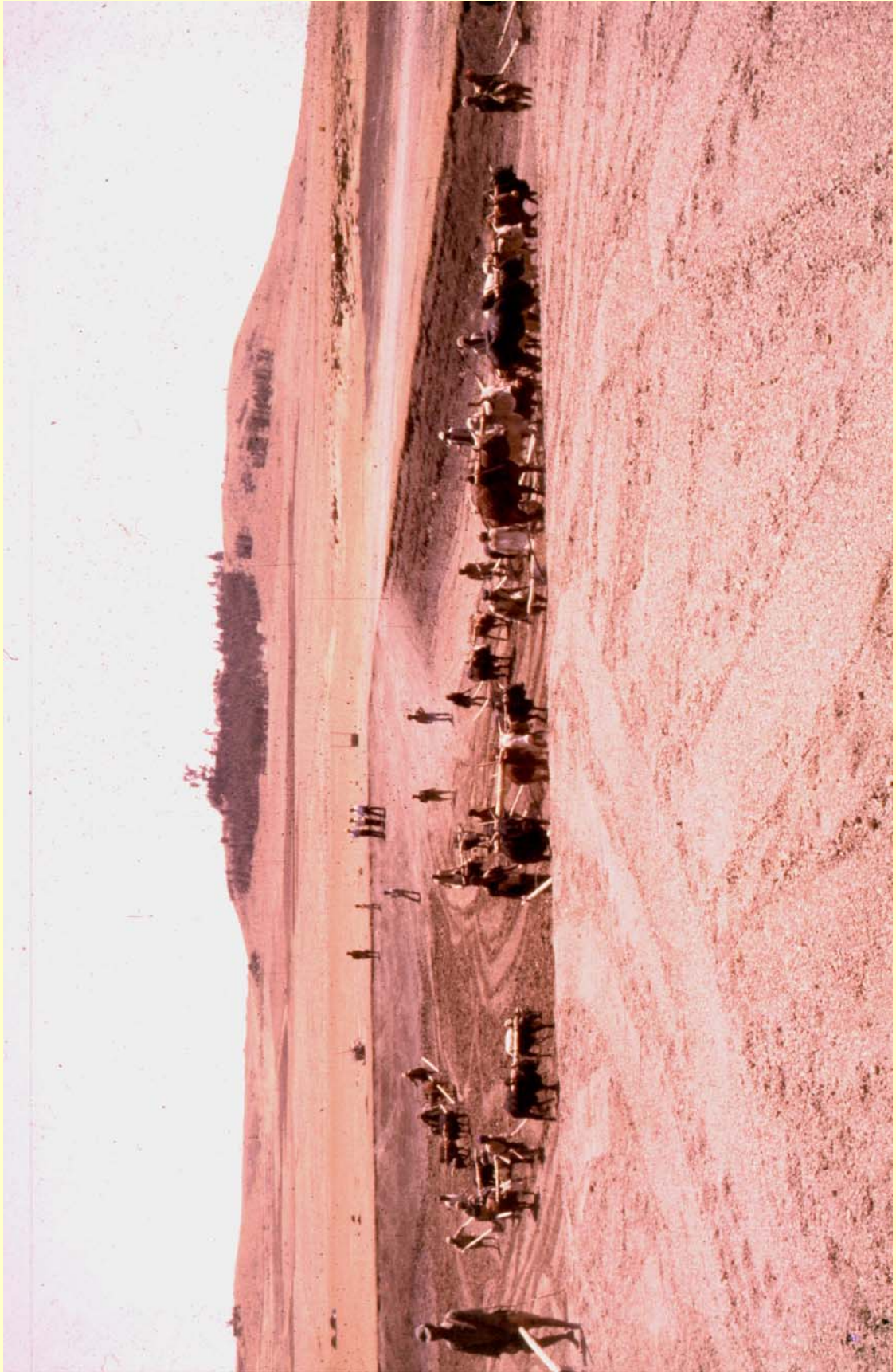






















Thank you

