Participatory mapping of irrigation schemes in Tanzania, Mozambique and Zimbabwe

Date and location: 30/11/2021

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Organisation: TISA Project
Study Objectives

• To build consensus among the farmers and their irrigation management committee about irrigation infrastructure and plot boundaries for effective governance of the irrigation systems

• To facilitate establishment of plot and scheme level information which will facilitate local authorities to issue certificates of custodian ownership of land which will make farmers legible to access credit from financial institutions for farming
Mapped irrigation schemes

• 14 irrigation schemes were mapped
  • 6 in Tanzania (Kiwere, Magozi, Nyamahana, Mafuruto, Idodi and Tungamalenga)
  • 6 in Mozambique (Namaacha (Mafuiane); Moamba (Bloco I); Boane (Manguiza) and Magude (Macuvulane I and II)
  • 2 in Zimbabwe (Mkoba and Silalatshani)

• Different mapping methodology were used
Mapping methodology

• Tanzania
  • Participatory Scale mapping using handheld GPS, the schemes were mapped from scratch as no maps existed
  • Collected data covers plot boundaries, irrigation infrastructure, farm access roads and particulars of plot owners (name, sex, age, phone number)
  • Produced maps were overlaid to satellite image

• Mozambique
  • Scale mapping using handheld GPS to collect spatial data and notebooks to collect details of plot owners (name, sex, age and phone number)

• Zimbabwe
  • Scale mapping using GPS enabled the use of tablets for data collection
  • Satellite image
Participatory mapping procedures followed

- Mapping familiarization
- Mapping details
- Data processing and map production
- Participatory feedback on draft maps, production and distribution of final scheme maps
Scale mapping to PGIS

• Produced scale maps which covers the scheme area, were overlaid on satellite images, which were accessed from Google map. The maps were used by farmers to point out issues connected to irrigation infrastructure and water management
  • Focus group discussion
    • Used to identify issues spatially
  • Field observations

Field observation in Nyamahana scheme

Focus group discussion in Mafuruto scheme
Map overlay on satellite image
Application of mapping outputs

• Farmer database
  • Exact number of plot owners with the location, accurate information to stakeholders
  • Collection of O&M fee, the information has enabled irrigation management to increase their collections. They know exactly size of plot for every farmer
  • Planning of scheme meetings (messaging members using mobile phones)
  • Production of irrigators membership card
  • Financial institutions use the information to verify farmers for loan processing (do they own land?)

• Maps
  • Scheme orientation (get full picture of the area without going to the field)
  • Mapping of issues spatially (infrastructure and water management)
  • Prioritization of issues in preparing operation and maintenance plans
  • Selection of farmers for various activities based on their locations (AIP participants, installation of soil and water monitoring tools e.t.c)
## Issues related to farm access roads

<table>
<thead>
<tr>
<th>Issue</th>
<th>Causes</th>
<th>Solution</th>
<th>Potential stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor farm accessibility</td>
<td>- Inadequate roads in the scheme</td>
<td>Upgrade some of footpaths by increasing their width and put culvert</td>
<td>Farmers, Ruaha National Park, CRDB bank, Transporters</td>
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<td></td>
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<td>places where water crosses (Figure 4.5)</td>
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<tr>
<td></td>
<td>- Blocking of existed roads</td>
<td>- Unblock all existed roads and put mark for road reserves</td>
<td>Scheme leaders, village government</td>
</tr>
<tr>
<td>Poor road condition</td>
<td>- Inadequate maintenance</td>
<td>- Conduct maintenance by using infrastructure maintenance plan</td>
<td>Scheme leaders, farmers, village government</td>
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<td></td>
<td>- Inadequate funds for maintenance</td>
<td>- Identify other sources of funds in the scheme</td>
<td>Scheme leaders, farmers, district irrigation engineer</td>
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<td></td>
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<td>- Increase amount of O&amp;M fee from 15,000 Tsh to 20,000 Tsh per acre</td>
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<td></td>
<td>- Inadequate culverts</td>
<td>- Install culverts where necessary as suggested in Figure 4.5</td>
<td>Scheme leaders, farmers,</td>
</tr>
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<td></td>
<td></td>
<td>- Awareness creation to farmers on importance of protecting farm roads</td>
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# ISSUES RELATED TO IRRIGATION INFRASTRUCTURE

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<tbody>
<tr>
<td>Diversion of river course</td>
<td>Poor cleanliness of intake area</td>
<td>Short term solution is to fill the diverted part using sacks filled with soil and clean the area to allow flow of water</td>
<td>Scheme leaders, farmers, NIRC, Ruaha national park, and district irrigation engineer</td>
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<td>Long term solution is to desilting the area using excavator, fill and compact the formed valley using bulldozer</td>
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<tr>
<td>Breakdown of irrigation canals, turnouts, intake area</td>
<td>Lack of infrastructure maintenance plan</td>
<td>Prepare infrastructure maintenance plan based on prepared inventory of infrastructure and agreed farmers priorities</td>
<td>Scheme leaders, farmers, district irrigation department</td>
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<td></td>
<td>Poor cleanliness practice</td>
<td>Review existing cleanliness plan and take actions to the farmers who dodge -use of contracted people to implement cleanliness of intake area, primary and secondary canals</td>
<td>Scheme leaders, farmers</td>
</tr>
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<td></td>
<td>Improper use of infrastructure</td>
<td>Awareness creation to farmers on proper use of irrigation infrastructure</td>
<td>Scheme leaders, district irrigation engineer, NGOs</td>
</tr>
</tbody>
</table>
Conclusion

• The mapping enabled farmers to identify water and infrastructure issues, its causes, solutions and potential stakeholders. Most of the issues were supposed to be addressed internal e.g. establishment of farm access roads.

• Result indicate increase on irrigation area between 10%-30%, from the reported area before mapping.

• The schemes collected less operation and maintenance fee (O&M), than what they were supposed to collect the difference was 20%-25%.

• There is great potential of using and scaling out the Participatory mapping approach, to help irrigators organizations manage water and infrastructure in the scheme.