Irrigation practices and challenges in Tana Sub basin

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Presentation outlines

- Introduction
- Overview of Tana Sub Basin, Blue Nile Basin
- Irrigation practices in Tana Sub Basin
- Challenges of irrigation
- Opportunities of irrigation
- Expectations from this project
- conclusion
1. Introduction

- Government, donors and NGOs are investing in developing irrigation systems, especially on small-scale irrigations in Tana sub Basin. This sub basin is also one growth corridor areas in the country. But has challenges which hinders growth is this sector. If the water potentials of the sub basin is efficiently used for irrigation as well as for other sectors, it will have contribution for the sub basin and for the nation. This project with its scientific knowledge, will have its contributions to address the challenges faced in the sector.
1. Overview Of Tana sub basin

- Ethiopia is divided into 12 river basins, among these Abay Basin is one
- Abay River Basin is divided into 16 sub basins, Tana sub basin is one
Over view of Tana sub basin---

- Has Lake and land part (Total area at outlet is 15,321 km²)
  - Land part area about 12,165 km² (80%)
  - Lake part area about 3156 km² (20%)
- One of 16 sub basins of Abay Basin
- Altitude 1786-4000 masl
- Mean annual inflow is 4,986 Mm³y⁻¹
  - Lake fed by more than 60 rivers
  - but 93% from
    - Gilgel Abbay,
    - Ribb,
    - Gumara and
    - Megech
- Mean annual outflow is 3,753 Mm³y⁻¹
- Population 3.7 million
# Irrigation practices in Tana Sub Basin

Current irrigation activities expressed based on schemes in the sub basin

<table>
<thead>
<tr>
<th>Irrigation scheme</th>
<th>Cultivated area in ha</th>
<th>Percent of share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modern River Diversion</td>
<td>6986.95</td>
<td>5.66</td>
</tr>
<tr>
<td>Traditional River Diversion</td>
<td>43651.54</td>
<td>35.36</td>
</tr>
<tr>
<td>Modern Spring Diversion</td>
<td>71.5</td>
<td>0.05</td>
</tr>
<tr>
<td>Traditional Spring Diversion</td>
<td>13101.72</td>
<td>10.62</td>
</tr>
<tr>
<td>Motor Pump</td>
<td>40954.3</td>
<td>33.18</td>
</tr>
<tr>
<td>Pedal Pump</td>
<td>183.34</td>
<td>0.15</td>
</tr>
<tr>
<td>Rope Pump</td>
<td>171.85</td>
<td>0.14</td>
</tr>
<tr>
<td>Pond</td>
<td>103.54</td>
<td>0.08</td>
</tr>
<tr>
<td>Hand Dug Well</td>
<td>12802.85</td>
<td>10.37</td>
</tr>
<tr>
<td>Can Irrigation</td>
<td>3666.74</td>
<td>2.97</td>
</tr>
<tr>
<td>Drip Irrigation</td>
<td>9.83</td>
<td>0.01</td>
</tr>
</tbody>
</table>
Future large scale irrigation plan in the sub basin

1. Koga dam irrigation (current)=7000ha
2. Rib Dam(under construction)=19925ha
3. Megech dam (under construction)=16,660ha
4. Meguch serba pump irrigation(under construction)=5254ha
5. Megech robit pump irrigation (under construction)=6532ha
6. Gumara Dam (under detail design)=13776ha
7. Jema Dam (under detail design)=7786ha
8. Gilgel Abay Dam(under detail design)=11508ha
9. Nw,NE&SW Tana, pump irrigation(under prefeasibility)=17,327ha

Total 105,768ha
Challenges of irrigation

- These challenges can be explained as technical constraints and knowledge gaps as
  1. inadequate awareness of irrigation water management as in irrigation scheduling techniques, water saving irrigation technologies, water measurement techniques, operation and maintenance of irrigation facilities,
  2. inadequate knowledge on improved and diversified irrigation agronomic practices,
  3. shortage of basic technical knowledge on irrigation pumps, drip irrigation system, sprinkler irrigations, surface and spate irrigation methods
  4. scheme based approach rather than area/catchments based approach for the development of SSI Schemes,
  5. inadequate baseline data and information on the development of water resources,
Challenges of irrigation-----

6. lack of experience in design, construction and supervision of quality irrigation projects,

7. low productivity of existing irrigation schemes,

8. inadequate community involvement and consultation in scheme planning, construction and implementation of irrigation development,

9. Poor economic background of users for irrigation infrastructure development, to access irrigation technologies and agricultural inputs, where the price increment is not affordable to farmers.
10. Access to infrastructure

- Smallholders have no reliable and year round access to basic infrastructure including:
  - rural roads,
  - transport,
  - communication,
  - storage facilities,
  - markets
Opportunities irrigation

- The basic opportunistic considerations regarding irrigation developments in TaSB are
  1. emphasis and priorities are given to irrigation in the growth and transformation plan of the country,
  2. indigenous knowledge and introduction of promising household water harvesting and micro-irrigation technologies,
  3. Government’s strong political commitment and encouragement to private sector and public enterprises involvement in irrigation development,
  4. abundant water resources, climate and land suitability,
  5. availability of inexpensive labor,
  6. availability of suitable lands for irrigation developments
7. Establishment of modern hydrological and basin information system

- Surface Hydrological monitoring system
- Meteorological monitoring system
- Ground water monitoring system
- Flood early warning monitoring system
- Water quality monitoring system
- Ecological monitoring system
8. Weather radar system established

- Weather, hydrological, and flood forecasting tools & systems establishment
Illustrative Options for Real-time Telemetry

Automatic Collection & Real-time Transmission
(e.g. GSM/GPRS, Terrestrial Radio, Satellite Radio, Meteorburst, broadband, etc. or combination possibly with local data logger storage backup)
9. Establishment of Basin authorities for integrated water mgt with multisystem **New building for ABA/TaSBO**

- Multidimensional videoconference system
- Research facilities
- Laboratory facilities
- Hydrological/Basin information system facilities
HIS/BIS communication network

Local Stations (LS)
- Hydrometric gauging station
- Class 1 Rain gauge station

Main Stations
- Central Station (CS)
- Secondary Station (SS)

Teletransmission
- 100 Kb/s: GPRS ? - LS to CS
- 100 Kb/s: GPRS ? - LS to SS
- 5 Mbp/s: ADSL ? - CS to SS & SS to CS

Ministry of Water Irrigation and electricity, Addis Ababa

TaSBO
Bahir Dar
ABA

BeSBO
Assosa
• Assessments of how do farmers manage irrigated agriculture
• Assessment of the contribution of irrigated agriculture to household income and sub basin, country?
• What are the problems encountered by the irrigation systems?
• Development of different models including;
  ➢ Simulation models (planning and real time water allocation models)
  ➢ Multicriteria analysis models (trade off analysis)
  ➢ Optimization models (maximize total benefit)
• others
To reduce environmental, and socioeconomic impacts, an integrated approach of water resource management is crucial.

Efficient irrigation system is the main components for water management.
The cumulative impact of the above activities would be:
- the drawdown of lake level,
- pollution of lake water by agro-chemicals,
- shrinkage of wetland,
- distraction of biodiversity,
- reduction in fish and other aquatic life
- siltation of lake and reservoirs

**Annual Renewable Water of Lake Tana = 3.75 BCM**

**Annual Water Demand = 3.87 BCM**

**Annual Water Demand > Annual supply**