



# **Institutionalization of Backward & Forward Linkages of Solar Irrigation (Ethiopian Context)**

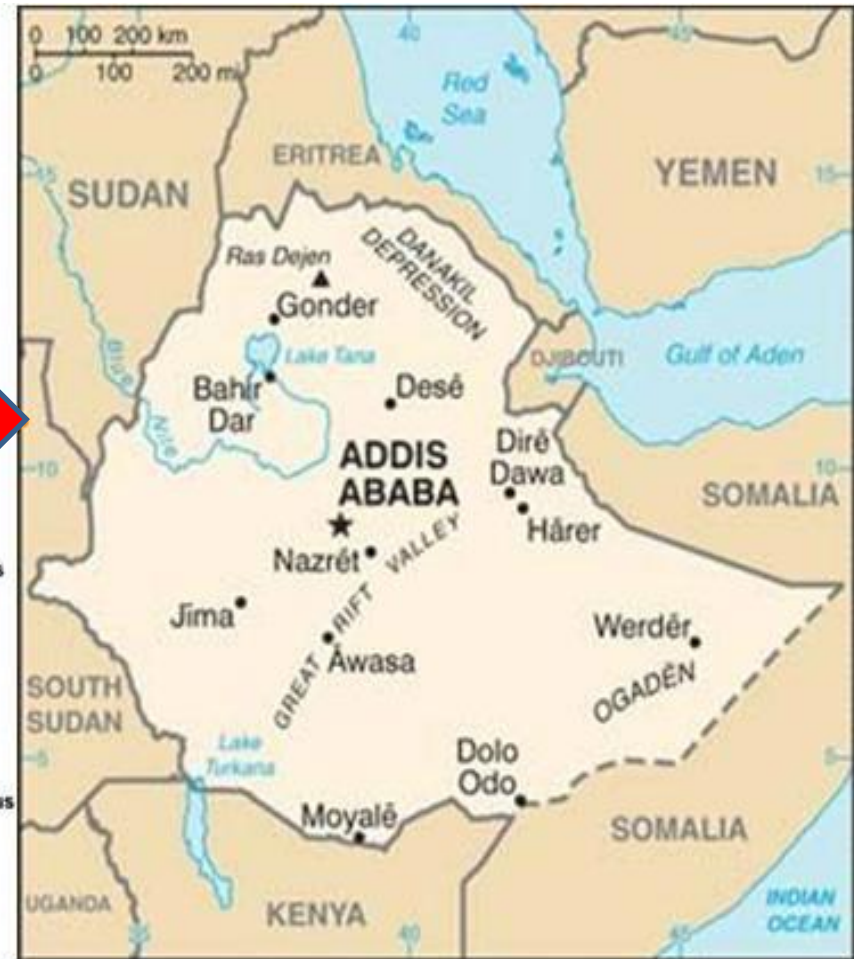
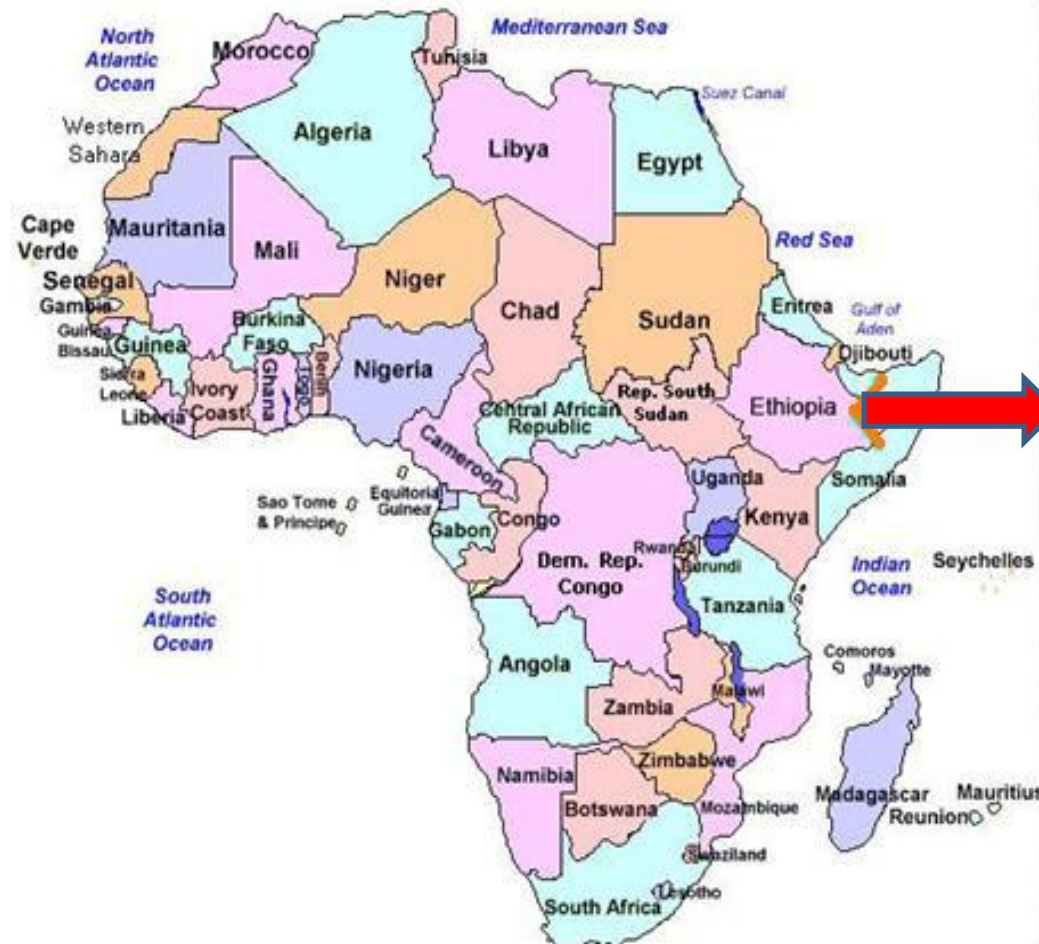
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# Ethiopia – basic data

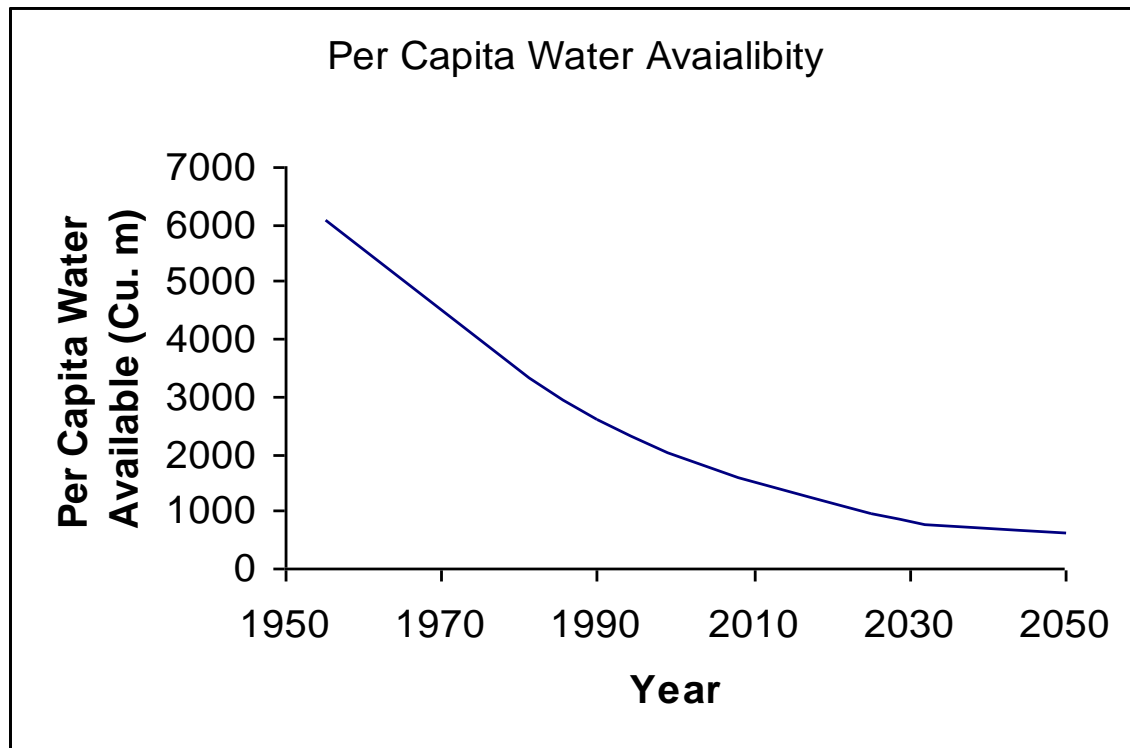
- Total area - 1.13 million square km
- Population Size: 120 million
- Population growth rate  $\sim 2.3$  % per year
- Average annual GDP growth rate  $\sim 10$  %

# Ethiopia – Horn of africa



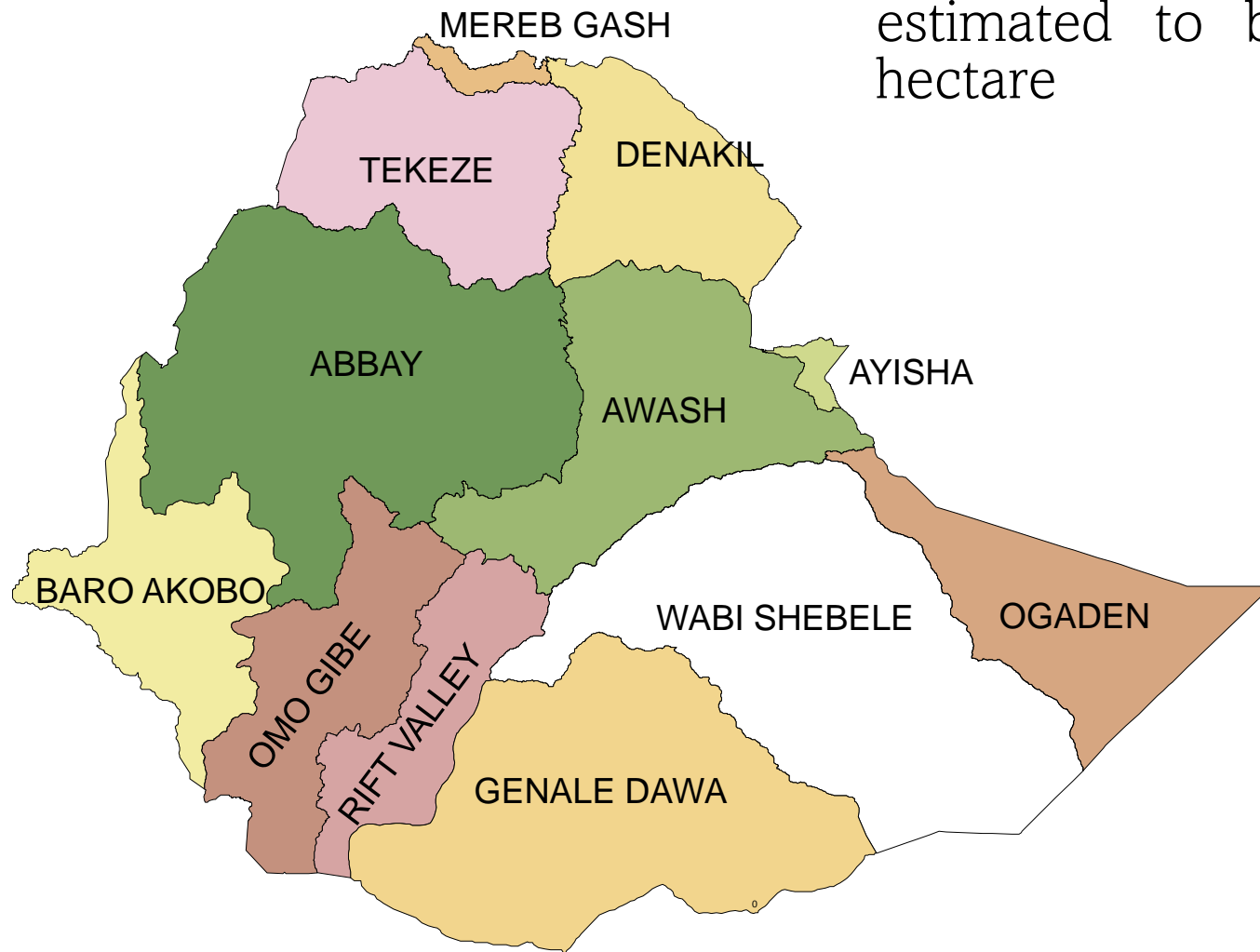
# Ethiopia – river basins

- 12 river basins
  - 123 billion m<sup>3</sup> Surface Water
  - 36-40 billion m<sup>3</sup> Ground Water



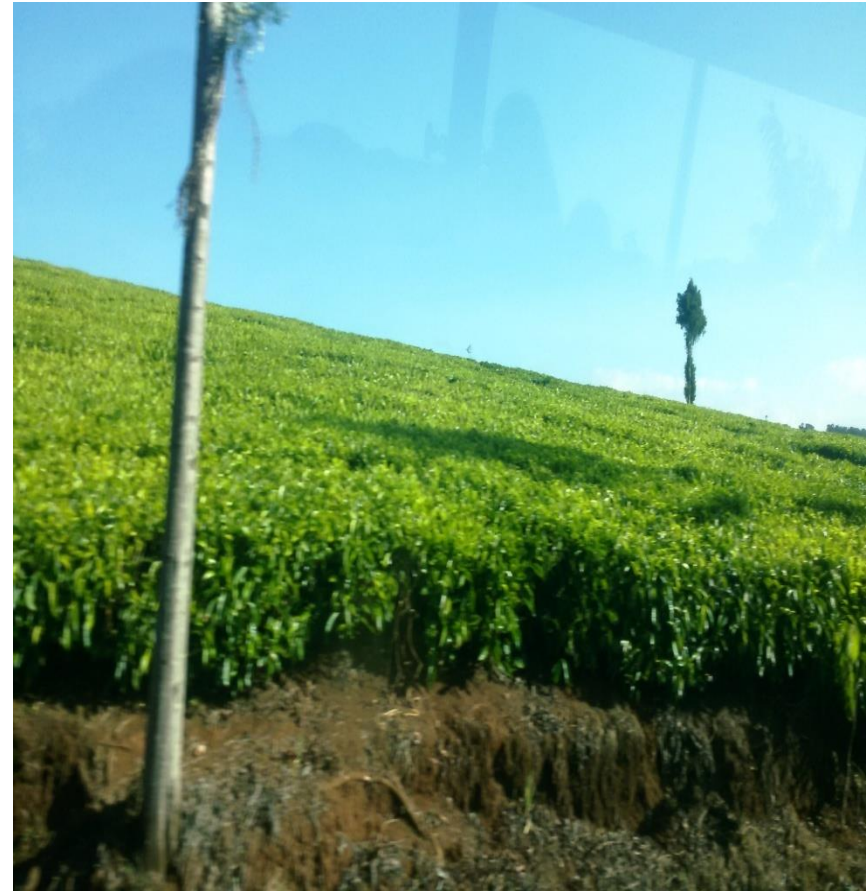
# Ethiopia – irrigation potential

Irrigation potential of Ethiopia  
estimated to be 5.3 million  
hectare



# Objectives of Irrigation Development

- Ensuring food security at household and national levels
- Production of raw materials for agro industries.
- Production of crops for export earnings.



# Large-Scale or Small-Scale Irrigation?

- ❑ Large scale solar irrigation activities are not common due to two basic reasons:
  - ❖ Requirement for large size PV systems
  - ❖ Reduction of significant irrigable area for installation of the large solar array
- ❑ Small scale solar irrigation are under demonstration through the project **Shallow Ground Water Irrigation Development** executed by the Ethiopian Agricultural Transformation Agency (ATA).

The next slides are extracted from the project **(Shallow Ground Water Irrigation Development)** report and included with courtesy of the Agency and additional information can be obtained from the project owners.

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# Major components of the small-scale project with specific objectives

<b>1</b> <b>Scaling up SGW mapping and regulating SGW use</b>	<b>2</b> <b>Promotion of business groups around SGW development</b>	<b>3</b> <b>Promotion of high value crop production and marketing</b>	<b>4</b> <b>Promotion of energy efficient and water saving technologies</b>	<b>5</b> <b>Enhance project management, coordination and evaluation</b>
<ul style="list-style-type: none"> <li>• Focuses on providing <b>accurate information on the availability of SGW</b> potential and regulate SGW use</li> <li>• Targets <b>mapping of SGW potential</b> over 200,000 km<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Aims to <b>strengthen the supply chain</b> for irrigation technologies and services, increase <b>adoption of technologies and increase well-drilling service availability</b></li> </ul>	<ul style="list-style-type: none"> <li>• Promotes <b>HVCs production and marketing</b> using irrigation by facilitating access to seeds, financial products, market and infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Identify and recommend <b>energy efficient and water saving technologies</b> for farmers, including female farmers</li> </ul>	<ul style="list-style-type: none"> <li>• Develop <b>capacity of the implementers</b> for effective project management, coordination and evaluation during and after the project timeline</li> </ul>

## Project scope

- 500,000 ha irrigable area
- 150 woredas having SGW potential
- ~1 million smallholder farmers (involved in the production of High Value Crops )

**Cross-cutting:** Capacity building interventions such as training and resource provisions are incorporated within each of the four components

# SGWM-Achievements so far

234,772 km<sup>2</sup>, 103 % of the target, has been mapped, with command area of >3 mil ha

## Issues

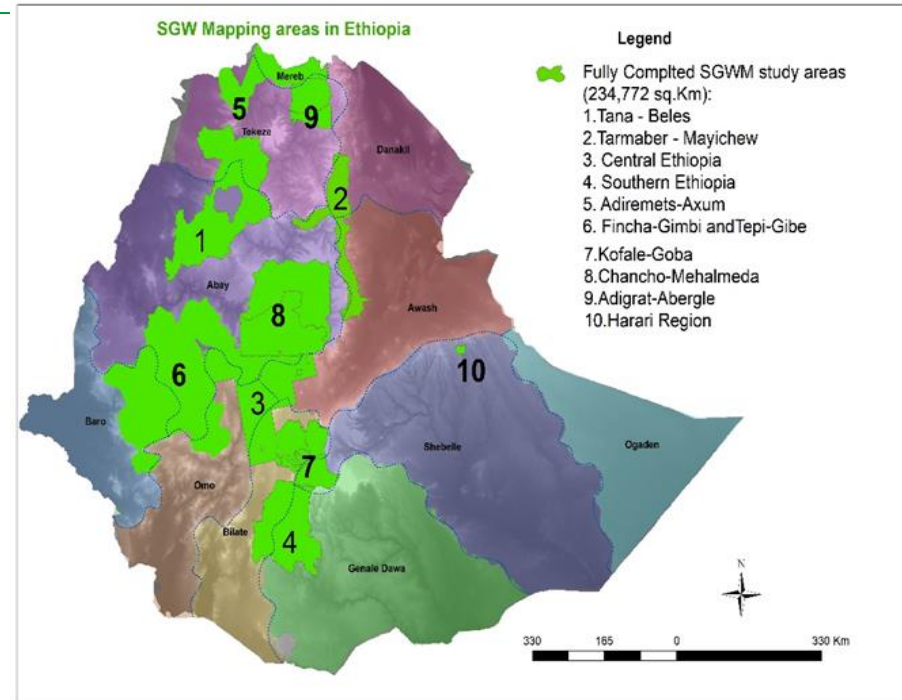
## Result Obtained

## Overall SGWM areas

### Quantity of shallow ground water

- 27.27 km<sup>3</sup> water is available at a depth of less than 30 m
- Well Spacing are defined based on annual recharge rate
- 3,088,395ha of land can be irrigated
- 6,176,898 beneficiary households on 356 woredas
- 169 navigational tools procured & SGWM output uploaded
- 267 SGW Atlases are produced, published & distributed to 193 woredas
- Training on the use and operation of navigation tool on shallow groundwater development was provided to 286 regional and Woreda experts of the four main regions
- Additional training and experience sharing at Prague conducted for ATA staff

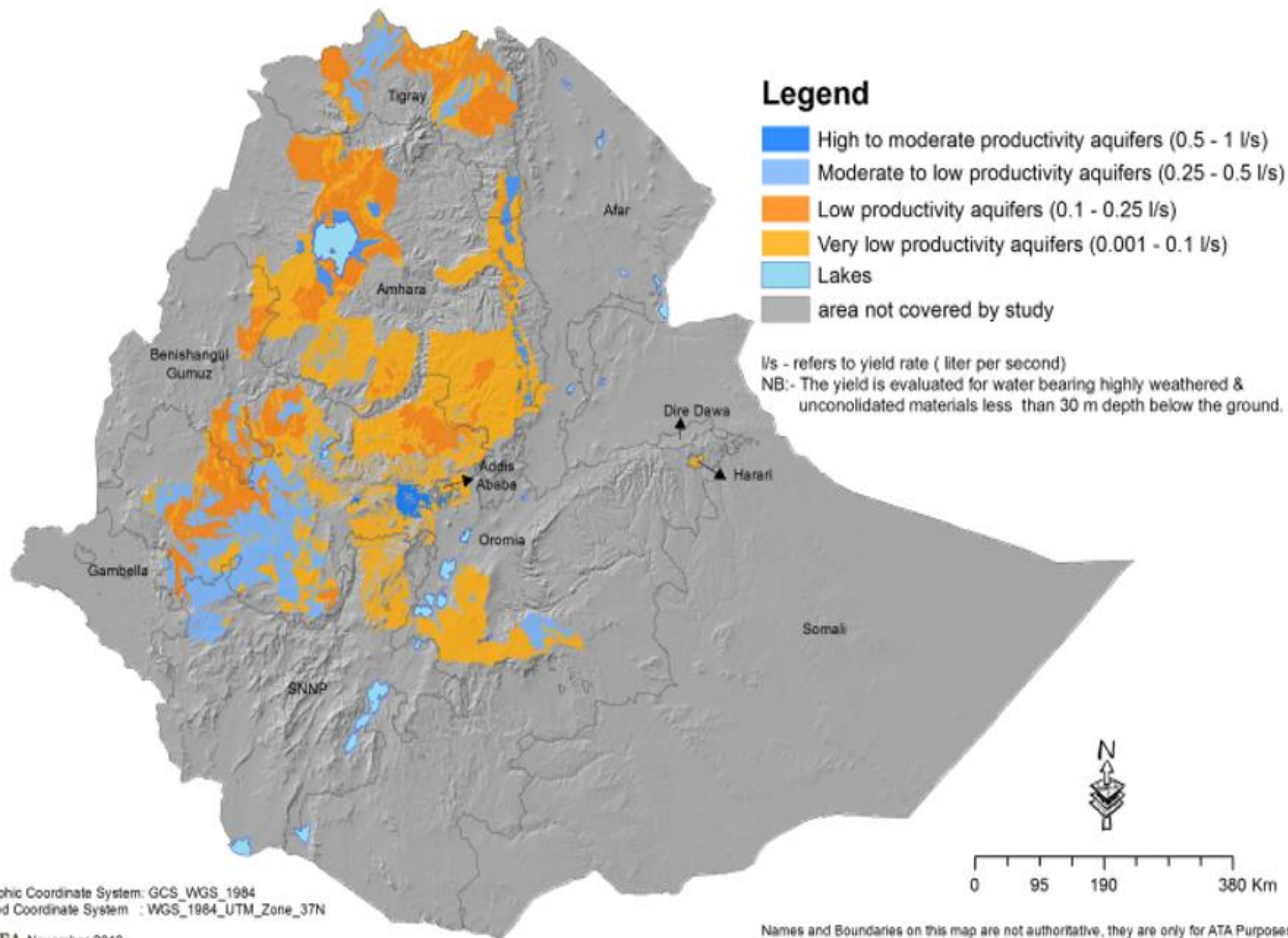
### HH and command area definition



### Recently completed and Atlas publishing

- Atlas development for Chancho- Mehale meda, Kofele-Goba, Adigrat – Abergele and Harai region on progress

# MAP OF SHALLOW GROUNDWATER AQUIFER POTENTIAL





# Solar pumped drip irrigation system



# **Current status of the Solar powered irrigation demonstration**

- ❑ The Four regions Oromia, Tigray ,Amhara and SNNP Regions 14 woredas installation of solar powered drip irrigation completed and site handover conducted
- ❑ 32 ha of land cultivated and covered by High Value Crops
- ❑ In addition, cost effective and better performing solar pumps(Sun culture) demonstrated at 10 farms in Oromia region.
- ❑ High value crops production and marketing promoted

# **Additional achievements done by the project team (Policy/strategy)**

- ☐ Household Irrigation Sector Strategy developed with 17 systemic bottlenecks across the value chain have been identified, to be addressed by 26 strategic interventions.
- ☐ National Small hold irrigation and drainage development strategy
- ☐ High value crops (HVCs) assessment tool is developed to define the most feasible crop for HHI and is under national use
- ☐ Excel based local cropping calendar development tool developed to address the basic economic questions of what to produce, when to produce, how much to produce and for whom to produce.

# **Additional achievements ...**

- ❑ Ethiopian Conformity Assessment Enterprises and MoA supported to enforce mandatory pump standards through pre-shipment testing arrangement. As the result 75 National pump standards are set of which 13 standards are endorsed as mandatory standards .
- ❑ Initiated agricultural equipment Tax exemption and approved
- ❑ National level engine pump supply chain studied and identified the bottle necks with corresponding recommendation.
- ❑ Initiated National irrigation drainage fund and under process to be approved



# Backward and Forward Linkages for Successful Dissemination of Small-Scale Solar Irrigation

- **Backward Linkages:** Availability of resources (water, land, agricultural input, access to finance, equipment tax exemption, knowledge and skills for system management)
- **Forward Linkages:** Market for the crops, private sector engagement for equipment and spare part supplies and service,



**THANK YOU  
FOR YOUR  
ATTENTION**

