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*Community based small scale irrigation
types and importance
in poverty alleviation.*

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Outline of the presentation

- 1 Definition of community small scale irrigation schemes and their benefits.
- 2 Water harvesting methods to be used for CB SSI
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- 3 Water storage mechanisms for CB SSI
- 4 Water application methods
5. Research areas

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Definition of community based small scale irrigation schemes and their benefits

- **. Irrigation area less than about 200 ha**
 - . Managed and owned by the community**
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 - . Irrigation system that is reproducible and affordable**
 - . Participatory - as explained as follows**

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• **People-centered participatory development project has, at least, the following eight characteristics**

People-centered participatory development project has, at least, the following eight characteristics:

- **A significant percentage of the specified group must participate at all phases of the project cycle.**
- **There must be clearly defined mechanisms for enhancing people's participation in project design, implementation, monitoring and evaluation.**



Fundamental resources questions:

- Land - Not constrained
- Water - Significant constraint due to mainly spatial and temporal variation
- SSI technology - simple technology can be adopted (from water harvesting - irrigation type / crops / trees - harvesting)

People -centered SSI development

- There must be **conducive policy environment and institutional arrangements** for participatory planning, which does not take place in a political and organization vacuum.
- Technological and organizational components of the project must be **culturally feasible**.
- .The project design must attain some reasonable standard of **ecological soundness**.

People -centered SSI development

- The project must show the **potential for self-reliance**; researchers and field workers should serve a catalytic function, not a welfare function, which promotes further dependency.
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- Mechanisms should be provided to make the project **sustainable and replicable**. Projects should not die when funding stops.
- The **learning process**, rather than the technical transfer of blueprints should be encouraged at every phase of the project cycle.

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Water harvesting methods to be used for CB SSI

Three groups of water harvesting techniques:

- . Rainwater harvesting
- . Floodwater harvesting
- . Groundwater harvesting

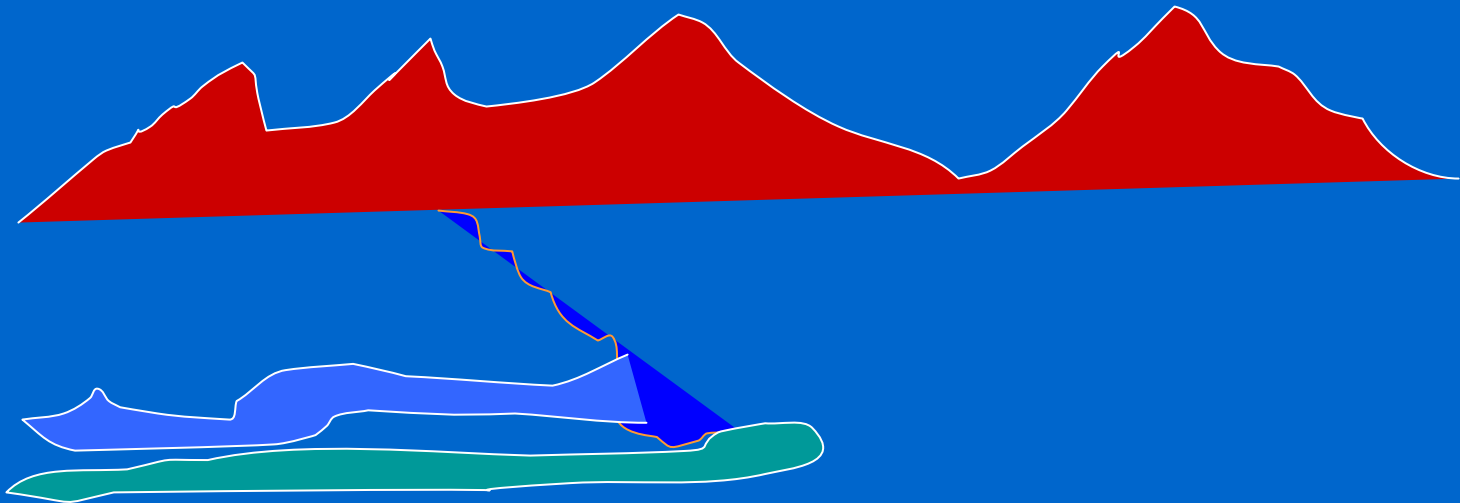
Rainwater harvesting

Rainwater harvesting - as a method for inducing, collecting, storing and conserving local surface runoff for agriculture and domestic uses

- Water collected from roof tops, courtyards, asphalt for the purpose of domestic / garden crops.
- Micro-catchment water harvesting - collecting surface runoff from a small catchment area and storing it in root zone of an adjacent infiltration basin - trees and annual crops may be planted.

Rainwater harvesting continued:

- Macro-catchment water harvesting (harvesting from external catchment) - runoff from hill-slope catchment is conveyed to the cropping area located at hill foot on flat terrain.



Flood water harvesting - Spate irrigation

It is the collection and storage of creek flow for irrigation use

- Two Types:

- Floodwater harvesting within streambed
- Floodwater diversion

Floodwater harvesting within streambed

- The water flow is *dammed* and as a result inundate the valley bottom of the flood plain. The water is forced to infiltrate and the wetted area can be used for agriculture or pasture improvement.



Floodwater diversion

- The wadi water is forced to leave its natural course and conveyed to nearby cropping fields.



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Floodwater harvesting

Groundwater dams like *Subsurface dams* and *Sand storage dams*.

- They obstruct the flow of ephemeral streams in a river bed, the water is stored in the sediment below ground surface and can be used for aquifer recharge.

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In areas of perennial rivers

Pumped irrigation / simple gravity diversion

- Harer areas, lake Alemaya

- North wollo area

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In areas where groundwater is available

Shallow wells may be developed for use by community of developing SSI



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Storage Mechanism

1. Aboveground water storage
2. Underground water storage including the root zone

Aboveground water storage

Small storage systems:

- Micro dams
- Ferrocement tanks (about 60 m³)
- In undulating terrain, saucer type tanks formed by plugging creaks at both ends (length 20 - 50 m with depth of 2 to 5 m)

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Underground storage

- . Underground tanks for storage constructed from bricks, cement, stone or ferrocement.
 -
- . Now being introduced in large scale in Ethiopia



Gravity village level drip micro-irrigation advantages

- Increased mobilization of local capital savings,
- Reduced needs of administrative expertise,
- Faster development and utilization,
- More appropriateness for small land holdings,
- Running cost is very minimal,
- No land lost for water storage,

Advantages of Gravity drip irrigation contd.

- Water saving
- Resulting significant reduction in soil erosion,
- Easy to operate by the farmers who own the project after some training,
- Easy to manage by the farmers themselves, and
- Replication of the scheme is easily possible.

Suggested research area

- . Timing of water application to different plants for different geographic areas for community based SSI.
- . Adopting technical manual for community based water harvesting technologies linked with SSI for different climatic condition and topographic areas
- . Delineating Belg rain (250 - 400 mm) receiving areas which has a high potential for SSI (Belg rainfall supplemented with harvested water).

Suggested research area continued

- Selecting appropriate fruit trees, fuel trees, cash crops, vegetables which can be adapted for local climate and topography
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- Appropriate water harvesting for cattle rearing in conjunction with SSI (e.g. Awash and Wabi Shebele Basins).
- Institutional arrangements for research and development on community based SSI.

Suggested research area continued

- Regional parameters to be developed:
 - Number of days in which the rain exceeds the threshold rainfall (5 mm per event)
 - Interval between rainfall events for both Small and main rainy seasons.

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Thank you for listening

