Context

Helvetas Swiss Intercooperation, Ethiopia has been implementing both the Beles SUNRise Project (BSP) and the accompanying Rural Roof Water Harvesting Initiative (RRWHI) in Tigray Region in Ethiopia since 2010. The BSP is a rural livelihood development project implemented in close collaboration with the Regional Bureaus of Agriculture & Rural Development, Water Resource Development, Woman Affairs and Youth & Sport.

The BSP project team has developed an innovative solution to overcome the severe drinking-water constraints prevailing in many parts of the region: The rapidly growing number of houses with corrugated iron sheet roofs provides a reliable opportunity for roof-water harvesting for household drinking-water supply.

The Kalamino Cistern was developed over a 3-year period starting in 2009 and funded by the Swiss Agency for Development and Cooperation (SDC), Swiss Solidarity and Ethiopian Enterprises (EE). Since then more than 1000 cisterns have been constructed in Tigray and Amhara Regions for households with severe drinking-water supply constraints.

The Kalamino Cistern has a water storage capacity of 7200 liters. If used with 130% efficiency – i.e. by using water during the 3-month rainy season which is then subsequently replaced – the cistern can supply up to 9000 liters of safe drinking water in a normal year, or 5 liters of drinking water per person in a five-person household every day of the year.

Impact

- Significantly improved household drinking-water supply and family hygiene
- Reduced workload for women and female children
- Enhanced household climate resilience
- Skill development
- Institutional capacity development
- Creation of local job opportunities
A house with a corrugated roof area of 20 m$^2$ can harvest approximately 9600 ltrs of rainwater per year (with 600 mm annual rainfall and 80% of roofwater harvested – 1 mm of rainfall = 1 ltr per m$^2$).

**Description**
- Used for household drinking-water supply
- Water storage capacity 7200 ltr
- Super slim ferro-cement cistern wall (only 8 cm thick)
- Low cost: USD 375 (ETB 7,500) → Only USD 52. (~ ETB 1,040) per m$^3$ water storage (cost excludes the corrugated iron roof). A PVC tank of the same volume costs approximately USD 100 (ETB 20,000)
- Minimum corrugated roof catchment required: 15-20 m$^2$

**Management**
- Training of Comt. Technicians
- Establishment of WASHCOs
- Water quality control
- Cost sharing / recovery
- Job creation

Roof-water is collected in a slid-open PVC pipe attached to the corrugated iron sheet roof. A first splash discharge outlet (red circle) allows users to discharge dirty roof-water for a short while when rainfall starts. The outlet is then closed manually, and clean roof-water is collected in the cistern.

**Remaining challenges**
Previous roof-water harvesting initiatives failed to a large extent, mainly due to inappropriate technical designs and management shortcomings. Hence, this household-based, roof-water harvesting system is still subsidized (85%). Decentralized construction poses a challenge to timely material supply and supervision. Further efforts are needed, aimed at disseminating the technology at cost by private entrepreneurs in order to create new employment opportunities.

Note: For more technical information, refer to the construction guideline.

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