

Technology Fact Sheet

Surface Self-flowⁱ

- 1) **Sector:** Agriculture
- 2) **Subsector:** Irrigation
- 3) **Technology Name:** Surface self-flow. Technology in which the flow of water is providing by the natural inclination of relief. In Kakheti mainly is recommended row irrigation.
- 4) **Option Name:** Irrigation of arable lands.
- 5) **Scale:** Mainly territories eastward to the Zemo (Upper) and Kvemo (Lower) irrigation systems main canals, west to the Naurdali irrigation system and south to the Samgori Upper main canal (R. Iori).Kakheti region (East Georgia).
- 6) **Availability:** Technology is available and is one of the efficient and cheapest ways to irrigate arable territories. This is traditional for Georgia and for this region.
- 7) **Background/notes (short description of the technology option)**

This method is most widely used when the flow of water is conditioned by the natural inclination of relief. The command mark is located above the irrigated territory. Any irrigation system must have the headwork – hydro technical construction allowing the distribution and water take-off from the system. It is built at the head of derivation or main canals. The headwork provides the constant supply and regulation of water flow in the system. The technology is mostly used in case of relatively soft and uniform relief, with inclination in the range of 0,001 – 0,03; With large (>800-1000m³/ha) norms of irrigation; To wash down salts from saline and alkali soils; In areas with strong winds. There are 3 types of irrigation technologies: by rows, by the free flow and by filling to overflow. The row irrigation is used for choppered crops (e.g. maize). According to the inclination of slope and properties of soil the rows could be through or shut-off, short (60-80m) or long (450-500m). One row can pass through 0,1-3,0 l/min and more amount of water. When designing the ground canals, it is important to select flow velocities preventing washing out of the canal bed or, on the contrary, sedimentation of suspended particles.

- 8) **Implementation assumptions (how the technology will be implemented and diffused across the sub-sector)**

The territory for irrigation must be featured by relatively soft (inclination 0,001-0,03) and uniform relief. Suitable territories are indicated above in the section “Scale” of this technology description.

- 9) **Impact statements**

- **Country social development priorities:** Employment of local population, holding up of migration processes, rising of living standards of residents.

- **Country economic development priorities:** Agriculture is one of the priorities of Government.
- **Country environmental development priorities:** Prevention of soil degradation (marshing, salination, erosion).
- **Other consideration and priorities such as market potential:** The absence of data for optimizing the irrigation network and determining the optimal flow velocities in canals; Absence of orthogonal photographs and recent data on land inventory and land-use. The impossibility to rapier the canals with efforts of local population (excluding the Naurdali irrigation system). The headwork of Satsiskvile canal in the upper part of R. Alazani is to be reconstructed (cost 4-5 thousand Lari). The irrigation network is to be cleaned (the cleaning of Alazani upper and lower main canals costs about 350-400 thousand Lari). The draining system is to be arranged by drilling the vertical wells (drilling of about 3 hundred 5-meter deep wells costs about 150 000 Lari). In the first place these works have to be undertaken in Sighnakhi and Dedoplistskaro districts. The skilled irrigators must be prepared to provide optimal use of water from irrigation systems. The energy supply is to be organized for pumping water by the draining system. Irrigated lands are to be classified according to irrigation technologies and machinery, and relevant recommendations must be worked out.

10) Costs (US\$)

- **Capital costs over 10 years:** Capital (main) expenses for 10 year period – Medium-size headwork (3 million Lari); Construction of 1m concrete canal (100-200 Lari); Laying of 1m ground canal (30-50 Lari); Rehabilitation of 1 ha (1000-1500 USD); Drilling of 1m draining vertical well (100-120 Lari).
- **Operational and maintenance costs over 10 years:** Cleaning of 1m canal (2-3 Lari); Cleaning of 1m³ of river beds (1 Lari). Annual monitoring and expert examination (3000-4000 Lari).
- **Other costs over 10 years:** N/A

ⁱ This fact sheet has been extracted from TNA Report - Adaptation for Georgia. You can access the complete report from the TNA project website <http://tech-action.org/>