Technology Fact Sheet

Artificial raining [i]

1) **Sector:** Agriculture

2) **Subsector:** Irrigation

3) **Technology Name:** Artificial raining

4) **Option Name:** Irrigation of arable lands.

5) **Scale:** Recommended for foothills of the Great Caucasus and Gombori Ranges, territory south to the Kvemo Alazani irrigation system. Kakheti region (East Georgia).

6) **Availability:** Technology is available at the world market but is not spread and easy available in Georgia. This technology is one of the most effective and relatively inexpensive way for the irrigation of arable lands.

7) **Background/notes (short description of the technology option)**

The watering with gravity flow is used in areas, where the inclination does not exceed 0,02-0,03. In case of mountain relief, with inclination more than 0,03 the irrigation by artificial raining is more convenient. The raining devices are mobile, stationary and semi-stationary. The water pressure in systems usually is created by pumps, consuming large amount of electric energy. This way is expansive and is not available everywhere. If the difference of elevations between the command and watered territories is significant, it is possible to use the natural (gravity) pressure of water. In case of artificial raining the main problem is to determine the mean intensity of artificial rain and to regulate it. The rain intensity must be relevant to the soil permeability to water. The watering of slopes in foothill conditions is opportune by natural pressure using long-range spraying devices. In this case relatively efficient is the stationary water-supply network. In case of long-range spray raining devices different raining methods are applied according to topography, soil properties and characteristics of device. On slopes the arrangement of terraces is recommended, that prevents the soil erosion and decrease water losses. This technology also promotes the washing down of salts from saline and alkali soils. Accounting for

further global warming this technology is anticipated to be widely used in plains, and especially in foothill and mountain areas up to altitudes of 1300-1500 m a.s.l.

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

Plains and particularly foothill territories with inclination of more than 100, territory south to the Kvemo Alazani irrigation system, right banks of R. Alazani, where gorge prevent the use of self-flow irrigation. Accounting for global warming this technology will diffuse to large foothill areas, where about 30% of territories are to be developed and put into production.

9) Impact statements

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

- **Country economic development priorities:** The yield of crops increases by 2-3 times; Labor expenses are decreased by 80%. The watering norm per 1ha is lessened by 200-300m3; Soil erosion from irrigation virtually is excluded; Physical and biological properties of soil are improved; The surface of plants is cleaned and ameliorated microclimate is established around the plants, increasing their resistance to drought.

- **Country environmental development priorities:** Prevention of soil degradation (marshing, salination, erosion).

- **Other consideration and priorities such as market potential:** Machinery for artificial raining; Detailed mapping of the territory; Orthogonal phographs; Recent data on land inventory and land-use; Arrangement of terraces on the slopes; Creation of natural water pressure; Artificial raining is complicated by high winds, so the planting of wind-breakers is necessary in operational areas. Training of skilled irrigators to provide the optimal consumption of water resources.

  Accounting and specification of underground water stockpiles and operational resources, determination of the number of functioning and closed down wells to include the Alazani-Agrichai artesian basin into the irrigation network of R. Alazani southern section. Arrangement of energy supply for pumping station.

10) Costs (US$)

- **Capital costs over 10 years:** Capital (main) expenses for 10 year period – Watering of 1ha applying raining technology (9000 Lari); arrangement of stationary water-supply network per 1ha (700-900 Lari); Construction of 1m terraces on slopes (200-300 Lari).

- **Operational and maintenance costs over 10 years:** Cleaning and putting in order of stationary water-supply network per 1ha (400-500 Lari); Putting in order of terraces, per 100m (50-100 Lari).

- **Other costs over 10 years:** N/A

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[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/**