Technology Fact Sheet

Wind breakers [i]

1) **Sector:** Agriculture

2) **Subsector:** Soil degradation

3) **Technology Name:** Wind breakers

4) **Recommended option of technology:** Wind breakers

5) **Scale:** The technology is recommended for the application in the following regions of East Georgia. Shida (Inner) Kartli (Gori, Kaspi, Mtskheta administrative districts), Gare (Outer) Kakheti (Gardabani, Sagarejo, Sighnakhi districts) and Shiraki (Dedoplistskaro district).

6) **Availability:** The recommended technology is less accessible to farmers, as the arrangement of windbreaks is a highly expensive measure and so the state support is of great importance for the rehabilitation and planting of wind shelter belts

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

   The decisive measure (technology) to combat against the wind erosion is the arrangement of windbreaks. The rising of their effectiveness could be achieved in two ways: 1) By increasing the efficiency of separate belts (optimization of wind conductivity and increase of the belt high) and 2) By drawing nearer the belts in the system, providing the limitation of wind speed above the critical level. The height of windbreak, which is restricted by natural conditions, comes out as a limiting factor as well. In case of optimal height and wind conductivity of the shelter belt, the critical wind velocity could be achieved at the soil surface and in the open field. The effective protection of soil from wind erosion could be attained for any velocity of wind by bringing nearer the windbreaks. The critical value of wind speed is considered to be that, at which the calculated loss of soil does not exceed the permissible level. In its turn, the value of soil permissible loss should not exceed the rate of soil generation. The determination of width, height of windbreak and the width of protected field is possible for any particular field using the wind erosion forecasting models (technologies), such as WEQ and WEPS. The application of mentioned technologies is possible only for concrete plots. The WEPS model makes it possible to define in real time the loss of soil and to conduct the monitoring of wind erosion development in real time as well.

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

   The implementation of recommended technology is impossible for individual farmer without assistance, as the proper planning of windbreaks is necessary according to wind speed and direction. However, looking after the planted and grown (2-3 years old) shelter belt is fully accessible to farmers, so much to those owing large areas of land or to agrofirms

9) Impact statements

- **Social development priorities:** Overcoming the poverty, decreasing the number of ecomigrants

- **Economic development priorities:** The technology is important for the development of such priority sector of Georgia's economy as the agriculture is. The quality and productivity of land is of major importance for the development of agriculture

- **Environmental development priorities:** The wind degradation of soil is directly connected with the climate change. The combat against adverse results of climate change is one of priorities of Georgia Ministry of Environment and, in general, of Georgia's Environmental Action Plan. One of the most important resources endangered by climate change is the agricultural land

- **Other factors:** The conduction of wind erosion protective measures will retain the soil-main resource of agricultural production. Its fertility will be increased and the crop productivity will grow as the content of humus should not be reduced due to the lessening of high winds impact. The cost price of produce will be cut down. The offered technology was traditionally used in Georgia and definite technical experience exists in this field, which requires renovation considering the climate change process

10) Costs (US$)

- **Capital costs over 10 years:** In Georgia mainly were spread 60m wide windbreaks at collective farm lands and 10m wide belts at private plots. The rehabilitation of 1ha of 60m wide windbreak costs 14000 USD, including the expenses on looking after the plants for the first 3 years. The rehabilitation of 1ha of 10m wide windbreak costs 13300 USD

- **Operational and maintenance costs over 10 years:** The subsequent looking after of 1ha of windbreak costs 3000 USD.

- **Effectiveness of technology:** The use of recommended technology will sharply reduce or completely halt the soil erosion processes at tilled lands, resulting in the improvement of soil physical, chemical and biological properties. The biological activity and fertility of soil will increase.The crop yield of cereals will increase by 0.50-0.80 t/ha and the cost price of produce will decrease

- **Barriers**

    - The planning of windbreaks requires the consideration of wind speed and direction, that is inaccessible to individual farmer without proper consultations. Such consulting service is not organized yet and, hence, widely available.
    - Under the land degradation conditions a single inch of land is important. Therefore usually it's difficult to famers to allocate some area for the windbreak.
    - The awareness and being kept informed among the farmers on the role of windbreaks in the land degradation is very low.

- The protection of windbreaks from the cattle and following up fires at the first stage of their development is a complex problem for the individual farmer

[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/**