Technology Fact Sheet

Sector	**Agricultural Soils**
Technology name	**Classic tillage on slopes with more than 5 ° gradient, in a crop rotation with participation of field seeded crops only (spiked cereals, annual legumes, perennial herbaceous).**[i] Neonila Nicolaev, B. Boincean. Agrotehnica. Bălti, 2006. P. 225-230. Complex Program of degraded lands reclamation and increasing soils fertility. Part I. Ch.: Pontos, 2004. P. 85.
CO2 Emissions in „Agricultural Soils" sector, tons CO2	**Year 2010 – 3 000 787 t or 2,07 t/ha** (sown area – 1 451 500 ha, fallow land = 1 820 510-1 451 500 = 369 010 ha; on fallow lands the emissions were well balanced or slightly positive)
General description of the technology	Erosion is the main soil degradation factor (Annex 7). Aim of technology –antierosion protection of arable lands on slopes with more than 5 ° gradient. The technology is based on the principle of differentiated protection ensured by the foliage and variable density of the crops, which by protection degree can be divided into following groups: ***Very well protecting crops*** - perennial grasses and legumes after the first year of use, provide 90-95 percent protection; ***Well protecting crops*** -cereal grains, legumes and perennial grasses in the first year of vegetation, annual fodder plants with high density, provide 70-90 percent protection; ***Medium protecting crops*** - annual legumes, provide 50-70 percent protection; ***Poorly protecting crops*** – weeding crops with low density (maize, sun-flower, beets, vegetables), provide 20-50 percent protection. Anti-erosion effect is achieved by alternating strips of very well and well protecting crops with medium and poorly protecting crops, on the slopes. Implementing rotation of crops forming the first three groups only on slopes with more than 5 ° gradient provides 80% anti-erosion effect.
How the technology will be implemented and disseminated across the sector?	The technology can be implemented without restrictions by farms with areas of cca 200 thousand ha of arable lands on slopes with more than 5 ° gradient. The crop rotation should include cereal grains (50-60%), annual legumes (20-30 %), perennial herbs (20 %). The technology will have a positive effect on the environment: solid and liquid leaks from slopes will stop by 80 %; the fields at the foot of the slopes and in valleys, water basins and rivers, roads, hydraulic engineering installations, etc. housing will be protected.
Implementation barriers	Lack of a state anti-erosion system and management of farmland on slopes.
CO2 reduction as a result of technology implementation , tons CO2	On cca 200 000 ha CO2 emissions will be reduced by circa 70%. Annually, on 1ha of slope with a 5° gradient CO2 emissions will reduce by 2.07 x 0.7 = **1.5 t/ha.** In total, on the entire area of 200thousand ha reductions will amount to 200 000 x 1.5 = **300 thousand t/year.**
Impact – Impact of the technology on the country development priorities	
Impact of the technology on the country social priorities	Soils will be protected from erosion, welfare of rural population will improve in the long term, migration of population will be reduced, it will become possible to develop and implement different social projects.
Impact of the technology on the country economic priorities	Yields on eroded arable lands on slopes with more than 5° gradient (cca 200 thousand ha) will increase by 2 q/year, or 40 thousand t/year grain units . The benefit will be **cca $50 /ha/year or $10 mln / year** on the entire area of 200 thousand ha. Solid leaks (fertile soil) will decrease by 10 t/ha/year or 2 mln t/year on the entire area. The cost of **1 t** of black earth washed away from the slopes is **cca 10 dollars.** The costul of soil protected from washing away from the slopes is **$100 /ha/year or $20 mln / year on the area of 200 thousand ha**.

Impact of the technology on the country environmental priorities	Solid and liquid leaks from the slopes will decrease by **80 percent**, degradation of soils through erosion will stop, water regime, as well as other regimes will improve. The fields at the foot of the slopes and in valleys, water basins and rivers, roads, hydraulic engineering installations, etc. housing will be protected
Other impact	The slopes will acquire a more stable and productive agricultural landscape.
Costs	
Investment costs	The investment costs are the same as for grain crops (Annex 3, Table 3). For 1ha – **$213 once in 10 years or $21.3 ha/year.** For 200 000 ha **- $42.6 mln** once in 10 years or **$**4. 26 mln **/year** (for purchasing of the necessary equipment).
Operation and maintenance costs	For 1 ha – **$416 /ha/year. For 200 000 ha = $83.2 mln /year**
CO2 reduction cost	Cost of reduction on 200 000 ha = 300 000 t x **$**30 **/t = $9 mln /year**
Technology lifetime	This technology will be used permanently on 200 000 ha. Only the basic soil tillage methods will change, as a combination of these methods can be used under this technology.
Other	The cost of soils protected from washing on the 200 000 ha of slopes is **$20 mln / year**.

[i] This fact sheet has been extracted from TNA Report - Technology Needs Assessment for climate change mitigation - Republic of Moldova. You can access the complete report from the TNA project website **http://tech-action.org/**