Technology Fact Sheet

Sector	**Agriculture** (fig.2)
Adaptation needs	Adaptation to increased desertification of agricultural lands situated on slopes, occurring due to increased erosion generated by climate change. In Moldova the lands on slopes with a gradient greater than 2 ° account for 57 percent of the total area. Eroded soils on agricultural lands pedologically evaluated occupy 878 thousand ha. The crops harvested from eroded arable lands (400 thousand hectares) are by 20% smaller in comparison with crops from non-eroded lands. Based on the average yield of cereal crops of 3 t / ha on non-eroded soils, crop losses are 0.6 t / ha / year, or 240 tons / year units of cereals on all eroded areas, which in terms of money is 46 million euro / year. Climate change is expected to generate aridization, increased frequency of torrential rains and, consequently increased erosion (fig2). This will lead to increased fertile soil losses and water from the arable soils on slopes, increased pedological drought and crop reduction. To facilitate adaptation to climate change two simple, inexpensive and effective soil erosion control technologies are proposed.
Name of technologies	**In depth fissuring (30-35 cm)** [i] (fig. 5 and 6)
How this technology contributes to adaptation	Results in erosion reduction by up to 70-80% on slopes with 2-5 ° gradient, used for growing weeding crops. In combination with the growing crops on alternative strips ensures reduction of erosion up to 90%. It reduces the risk of soil deterioration and desertification of arable soil eroded as a result of climate change.
Short description of the technology option sourced from ClimateTechWiki.	The deep loosening of soil increases water permeability, thus decreasing liquid and solid leaking from the slopes. Virtually total absorption of the water from precipitations by soil, stops the erosion and ensures more effective use of water by plants and provides for their better development. Losses of topsoil from the slopes are decreased by on average 5 t / ha.
How this technology will be implemented and spread across the sector?	This technology shall be implemented by agricultural businesses on their eroded lands, occupied by weeding crops. The total area of such lands in the country is about 200 000 ha. Implementation will require a PRVH -2.5 type aggregate with arrow type rippers and a tractor). Small scale/short term implementation.
Costs	Purchasing of a ripper and a tractor (Belarus type tractor, at a price of 25 000 euro, and a ripper at a price of 15 000 euro for 200 ha, total 40 000

	euro), and costs of scarification works (1ha-20 €, taking into account the cost of wear and fuel).
Country social development priorities	It provides long-term preservation of soil fertility - the main means of production of the country, increases yields by 10%, decreases the negative effect of climate change by retention of summer rainfall water in soils.
Country economic development priorities (economic benefits)	The weeding crops on eroded soils (about 200 thousand ha), will increase yields by 10 percent or 2q cereal units. It will generate an additional gross income of about 40 € / ha / year (net income 20 € / ha / year), the total gross for all weeding crops on eroded soils (200 thousand ha) - 8 million euro per year, the net economic benefit - 4 million euro per year. The cost of one tone of washed away black soil from the slopes is about 8 euro. Loosening reduces soil losses by 5 t / ha, the calculated benefit based on the cost of prevented soil losses is 40 € / ha or 8 million per year.
Country environmental development priorities (environmental benefits)	The erosion-caused soil degradation processes will be minimized. The risk of roads, ponds, rivers, valleys salination and groundwater pollution will decrease. The ecologic stability of agricultural landscape will improve.
Social Benefits	Socio-economic effect from implementation of this technology will be the following: increased turnover and quality of agricultural production on eroded soils will increase well being and decrease migration of rural population.
Other considerations and priorities (ex. market potential)	The need to implement this technology will grow by 5-10% annually
Capital (investment) costs	40 million euro for purchasing the equipment needed to loosen the 200 000 ha of arable land under weeded crops, or 200 € / ha / 7 years (the time of equipment wearing), or 29 € / ha / year.
Operational and maintenance costs	The cost of loosening of 1ha of land under weeding crops on slopes, taking into account the wear of equipment and fuel costs is 20 € / ha / year or 4 million euro for 200 ha / year.
Growth potential	Increasing resistance of agricultural soils to erosion as a result of adverse climate change effects increases the market potential of this technology. Loosening of eroded soils on slopes can be made between rows and in vineyards and orchards.

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