Technology Fact Sheet

Sector	Agriculture
Adaptation needs	The existing soil cultivation systems entail intensive physical, chemical and biological degradation of soil. The classical soil cultivation system generated the phenomena of soil features degradation. Excessive plowing favored dehumification, damage of the soil structure, increased compaction, danger of erosion. It became necessary to develop new tillage systems known as " soil conservation works systems, SCWS". Mini-till and No-Till systems turned out to be the most effective.
Name of technologies	**No-tlll system and vetch as successive plant** [i]
How this technology contributes to adaptation	It is proposed to improve these two systems by including vetch as successive crop for green fertilizer. A crop of vetch (about 6 t / ha of dry weight containing 4% of nitrogen), and roots (about 4t/ha dry weight containing 2% of nitrogen) accumulates about 10 tons of organic matter in soil, which ensures synthesis of about 2.5 t / ha of humus containing about 200kg of nitrogen. This amount of humus is sufficient to create a positive carbon and nitrogen balance in soil during 2 years. The No-till soil cultivation system means that the sowing is done directly on the stubble field or field containing vegetal waste of the previous crop. The main mechanism for No-Till is the sowing machine. The main element of the sowing machine is the cutter. Recently, the cutters are combined with corrugated disc type blades in combination with chisel type blades. Gradually, the topsoil will become biogenic, well structured, loose, will contribute to a favorable air-fluid and nutrients regime and will increase the plants resistance to drought. Technology (large scale / medium-long term implementation)
Short description of the technology option sourced from ClimateTechWiki.	This technology contributes to environmental friendliness of agriculture, creating a positive balance of humus and soil carbon, return of about 200 kg of nitrogen into soil, of which 50% are of symbiotic origin, reduces the risk of reduced yields due to climate change.

How this technology will be implemented and spread across the sector?	This technology can be successfully implemented on 50 percent of agricultural lands. Vetch, as a successive crop used as green fertilizer, shall be sown once in two years after harvesting spiked cereals. Implementation of this complex technology requires vetch seeds production operation. The autumn vetch shall be planted, as appropriate, in late August or early September.
Costs	The costs for including vetch as successive crop used as green fertilizer under the no-till soil cultivation system are worth 85 € / ha for 2 years or 43 € / ha / year. Summary costs for weed control, sowing under no-till system are worth 60 € / ha / year, total of 103€/ha/year.
Country social development priorities	This technology ensures a long-term preservation of soil fertility - the main means of production of the country, protects the land from desertification processes entailing impoverishment and migration of population, creates economic prerequisites for replacing the existing system of subsistence agriculture with sustainable agriculture based primarily on employment of natural processes, biological and renewable resources and only secondarily - purchased resources. Preserved internal resources, the soil with its characteristics, water, biodiversity, etc., are a prominent feature of sustainable agriculture and subsequently, of combating land degradation and desertification. It reduces tractor wear and fuel costs by 2 times.
Country economic development priorities (economic benefits)	The annual crop growth over the whole period of vetch green mass action (2 years) is 1t/ha cereal units or 200 € / ha / year in monetary terms. The net benefit is € 115 / ha / year. If applied regularly, this technology contributes to a positive balance of soil carbon, excludes CO2 emissions, reduces the need to purchase and apply nitrogen fertilizers by 80-90 percent
Country environmental development priorities (environmental benefits)	It stops soil degradation, makes the humus and soil carbon balance positive or well-balanced, cardinally improves the soil biota status, increases resistance of soil to pollution and of plants to drought, agricultural products become ecologically cleaner.
Social benefits	The social - economic effect of this technology implementation will be the following: it will increase the turnover and quality of agricultural production on arable soils, wellbeing of rural population, and decrease migration.

Other considerations and priorities (ex. market potential)	It improves the ecological status of the land, the agricultural production process becomes more environmentally friendly.
Capital (investment) costs	It is necessary to purchase No-Till drill worth € 75thousand and a vetch green mass chopper of CHIARA type, worth € 7500, total capital expenditures - € 82,500.
Operational and maintenance costs	Expenses for organizing the vetch seed production process or purchase are worth 85€/ha/2 years or 43€/ha/ year. These expenses are included in the toal cost of vetch technology wich are 162 euro/ha.. The implementation area – 200 000 ha Total costs of technology: 32 400 000 euro.
Growth potential	The weight of this technology on the market will grow along with environmental friendliness of agriculture based on natural processes.

[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/**