

NS-282 - Implementation of soil conservation tillage system in the Republic of Moldova

Republic of Moldova

NAMA Seeking Support for Implementation

A Overview	
A.1 Party	Republic of Moldova
A.2 Title of Mitigation Action	Implementation of soil conservation tillage system in the Republic of Moldova
A.3 Description of mitigation action	This NAMA seeks: * To stop the degradation and erosion of agricultural soils. Arable agriculture in Moldova mostly uses conventional land and crop management technology, such as plowing, several subsequent cultivations and sowing with seed drills. While such techniques have worked before, they are not sustainable due to the negative impact they have had on the soil quality, the damaging effects being soil erosion, loss of organic matter, soil compaction and other. During the transition from the planned to the market economy promoted in 1990-2000, the negative soil balance featured carbon losses of up to 0.6-0.7 t /ha; * To maintain and increase agricultural crops despite changing climate. Lately, extreme natural phenomena and exceptional situations in Moldovan agricultural sector (droughts, rains, hail, freezing, floods, droughts) showed higher frequency and made plant production very instable during the year. * To fulfill the country's commitment on GHG emission reduction, established by its NDC to Paris Agreement. To reach these goals soil-friendly practices leading to accumulation of organic matter in the soil, and ultimately contributing to enough humus formation, should be implemented. Three technologies have been selected for further promotion, as the ones distinguished by entailing progressive soil conservation effects, and namely: - No till soil cultivation system with preliminary positive recovery of the post-arable layer and use of vetch as intermediary crop for green fertilizer (NTV). - Mini-Till soil cultivation system with preliminary positive recovery of the post-arable layer and use of vetch as intermediary crop for green fertilizer (MTV). - Classic tillage, including a vetch field (two yields per year – autumn and spring), as a „green fertilizer field” into a 5-fields crop rotation (CTV). The main reasons why NTV, MTV and CTV technologies were identified as priority measures for the Moldovan Agriculture sector are derived from the fact that they ensure long term maintenance of soils fertility – the main production means of the country, and protect the farmlands from degradation. All three technologies use vetch as a „green fertilizer field” into a 5 fields crop rotation; they differ mainly by the depth of crop waste conservation in the soil. The farmers' choice of technology depends on their local tradition, macro-climate availability and level of precipitation. The target is to implement the NTV, MTV and CTV technologies across a total area of 600,000 hectares, which accounts for 36% of the total arable land of the country, planned to use each of the three technologies on 200,000 hectares, on 20,000 hectares each year during 10 years, starting from year 2014. The systemic use of green fertilizer (autumn vetch of Violeta variety and spring vetch of Moldavscaia 82 variety) will result in a positive balance of humus and carbon in soil, and will contribute to a better nitrogen fixation in soil, entailing practically total CO₂ and N₂O emissions from soils. Implementation of this NAMA will lead to: CO₂ emissions reduction by 2.03-2.54t/ha/year; crop growth by up to 35%; decreasing by up to 80-90% of nitrogen fertilizer use annually; up to 30% decrease in fuel used by tillage machinery; restoration of the humus content, favorable structure of the soil arable layer; decreasing of non-productive losses of water from soil due to mulching which contributes to crop yield; pedological drought; stabilization of economic, ecological and social situation in rural areas. Conservation agriculture in the Republic of Moldova is only partially implemented. According to the estimates made in 2016, No-Till technologies are already being implemented on 200 thousand ha, with a 5% increase in 2017.
A.4 Sector	☐ Energy supply ☐ Transport and its Infrastructure ☐ Residential and Commercial buildings ☐ Industry ☒ Agriculture ☐ Forestry ☐ Waste management ☐ Other
A.5 Technology	☐ Bioenergy ☐ Cleaner Fuels ☐ Energy Efficiency ☐ Geothermal energy ☐ Hydropower ☐ Solar energy ☐ Wind energy ☐ Ocean energy ☐ Carbon Capture and Storage ☒ Low till / No till ☐ Land fill gas collection ☐ Other
A.6 Type of action	☒ National/ Sectoral goal ☐ Project: Investment in machinery ☐ Strategy ☐ Project: Investment in infrastructure

	☐ National/Sectoral policy or program	☐ Project: Other
	☐ Other	
A.7 Greenhouse gases covered by the action	☒ CO2	☐ CH4
	☒ N2O	☐ HFCs
	☐ PFCs	☐ SF6
	☐ Other	

B National Implementing Entity

B.1.0	Name	Ministry of Agriculture, Regional Development and Environment
B.1.1	Contact Person 1	Vasile Scorpan
B.1.2	Address	156"A", Mitropolit Dosoftei str., of. 37, MD-2004 Chisinau, Republic of Moldova
B.1.3	Phone	+373 22 232247
B.1.4	Email	clima@clima.md
B.1.5	Contact Person 2	Marius Taranu
B.1.6	Address	156"A", Mitropolit Dosoftei str., of. 37, MD-2004 Chisinau, Republic of Moldova
B.1.7	Phone	+373 69684528
B.1.8	Email	marius.taranu@clima.md
B.1.9	Contact Person 3	
B.1.10	Address	
B.1.11	Phone	
B.1.12	Email	
B.1.13	Comments	

[Add Additional Entity](#)

C Expected timeframe for the implementation of the mitigation action

C.1	Number of years for completion	10
C.2	Expected start year of implementation	2018

D Currency

D.1	Used Currency	USD
	Conversion to USD:	1

E Cost

E.1.1	Estimated full cost of implementation	257,500,000
	Conversion to USD:	257,500,000
E.1.2	Comments on full cost of implementation	Total investments required are US\$82 mil. for machinery acquisition and up to US\$175.5 million/year for O&M costs. Investments of US\$8.2 million are required to attract into the project 3x20.000 hectare of lands each year during 10 years, including: US\$2.4 million per each MTV technology, US\$3.4 million for the CTV technology. The amount of US\$17.6 million for O&M costs, including for purchasing seeds, is needed in the first 10th year the O&M costs will rise up to US\$175.5 million, as the operation will spread over 600,000 hectares. Respectively, the O&M cost for separate techno US\$5.5 million in the first year and US\$54.8 million in the 10th year for both the NTV and MTV technology; US\$6.6 million in the first year and US\$65.9 million year for the CTV technology. The estimated benefit resulting from the improved crop yield is 55 US\$ /ha/year (NTV, MTV) and -70 US\$ /ha/year (CTV) in the first year, reaching 300 US\$ /ha/year (NTV) and 225 US\$ /ha/year (CTV) in the 10th year, while CO2 reduction is estimated at 2.54 t/ha/year and 2.03 t/ha/year respectively. The NPV for the first 5 years is US\$38,3 million and US\$21.82 million for (NTV, MTV) and (CTV) respectively The sources of financing for this NAMA are the beneficiaries budgets, the national budget and donors' support provided as a grant and concessional loan. The farmers participating in the project are eligible for subsidies from state budget, according to the Government Decree no. 626/2016.
E.2.1	Estimated incremental cost of implementation	
	Conversion to USD:	0
E.2.2	Comments on estimated incremental cost of implementation	

F Support required for the implementation the mitigation action

F.1.1	Amount of Financial support	180,250,000
	Conversion to USD:	180,250,000
F.1.2	Type of required Financial support	☒ Grant ☐ Guarantee
		☐ Loan (sovereign) ☒ Equity
		☐ Loan (Private) ☐ Carbon finance

	☒ Concessional loan ☐ Other
F.1.3 Comments on Financial support	Due to the financial inability of most peasant farms, landowners are not able to make major investments in the sector. In order to implement the project financi needed. Donor support is required in the form of a grant equal to 5% of the value of the investment in agricultural techniques, and in the form of a concessiona up to 45% of the agricultural machinery and O&M costs. The national budget will contribute with up to 20% as a grant for agricultural machinery purchasing. This NAMA is planned to be implemented through the “Agency for Agricultural Intervention and Payments” established by the GD 05.07.2017.
F.2.1 Amount of Technological support	41,000,000
F.2.2 Comments on Technological support	Of the total of US\$41 million as Technological Support, US\$4.1 million are needed as a grant and US\$36.9 million as concession
F.3.1 Amount of capacity building support	300,000 Conversion to USD: 300,000
F.3.2 Type of required capacity building support	☒ Individual level ☒ Institutional level ☐ Systemic level ☐ Other
F.3.3 Comments on Capacity Building support	Capacity building support is needed for farmers and for the market analysis of the SME development. So far the NTV and MTV technologies are used on circa 200,000 hectares in Moldova. Even so, the experience gained is not eno successfully promote the project. Transfer of knowledge on the use of the best technologies is required for the implementation of conservation agriculture.

G Estimated emission reductions

G.1	Amount	1.218
G.2	Unit	MtCO ₂ e
G.3	Additional information (e.g. if available, information on the methodological approach followed)	CDM methodologies will be used to determine GHG emission reduction

H Other indicators

H.1 Other indicators of implementation	The implementation evaluation and monitoring indicators of this NAMA are: – Content of humus (organic carbon) in the soil. This is the key parameter that should be evaluated and monitored. It will be measured annually after the harvesting, by an outsourced R&D institution; – Type and quantity of herbicides used; – Quality and quantity of grains sown and harvested; – The number of effective hectares of land included in the project per each technology, i.e. NTV, MTV and CTV; – Effective amounts of harvested crop on the lands with and without vetch fertilizer; – The amount of reduced GHG emissions, calculated based on humus structure (organic carbon) and the UNFCCC approved methodologies; – Economic data: investments, O&M costs, income.
--	--

I Other relevant information

I.1 Other relevant information including co-benefits for local sustainable development	Main deliverables are: - high quality crop growth by up to 35%; - decreasing the nitrogen fertilizer needed annually by up to 80-90%; - decreasing the fuel used by tillage machinery by up to 30%; - restoration of the humus content, favorable structure and fertility of the soil arable layer; - decreasing the non-productive losses of water from soil; - partial or total stop of the soil erosion; Main beneficiaries: rural population – their welfare will increase, labour migrants will return to their native villages and exodus will decrease; overall the GDP of the country will increase. Main benefits: crops yield increase by 1.0 t/ha (wheat); fodder production/quality increase; farm income increase; national institution strengthening; soil cover improvement (residues, early seeding); enhanced soil moist increased soil fertility; reduced soil losses; increased soil organic matter; enhanced biodiversity; flexible labour inputs: seeding is in of rain onset; fewer tractors passes in fields; reduced downstream flooding.
--	---

J Relevant National Policies strategies, plans and programmes and/or other mitigation action

J.1 Relevant National Policies

The Soil Fertility Conservation and Enhancement Program for 2011-2020 and the Action for its Implementation, GD no. 626 / 2011. The objectives of the documents are the long-term preservation of soil quality and production capacity aimed at ensuring the food security of the country.

The National Agricultural and Rural Development Strategy 2014-2020, GD no. 409/2014. For the soil resources sector, the Strategy requires the use of modern land and agricultural management practices, etc.

The Environmental Strategy 2014-2023 and the Action Plan for its implementation, GD Nr. 301/2014. For the Agriculture sector, a 20% GHG emissions reduction is expected to be achieved compared to the baseline scenario by such actions as: creating the most favorable carbon balance in soil and maintaining long-term soil fertility, so that the agricultural by-products (straw and vegetal waste) is predominantly incorporated into the soil and less used as a source of energy; efficient animal manure management; use of sideral fertilizers and soil conservation cultivation technologies.

The Low Emission Development Strategy (LEDS) of the Republic of Moldova until 2030 and the Action Plan for its implementation, GD no. 1470 of 30.12.2012. According to conditional NDC, 41% of GHG emission reduction should be reached in the Agriculture sector by 2030 in comparison with 1990. Implementation of this NAMA is listed in the LEDS among other measures to reach this target.

J.2 Link to other NAMAs

(none)

K Attachments			
K	Attachments	Title Description	
No records to display.			
K.1	Attachment description		
K.2	File	Choose File No file chosen	

L Support received			
L.1	Outside the Registry	http://aipa.gov.md/ro/content/mac-p-mdt-%E2%80%9Dmanagementul-durabil-al-terenurilor%E2%80%9D In 2017 the World Bank Project "Competitive Agriculture in Moldova" (MAC-P) jointly with the Ministry of Agriculture, Regional Development and Environment launched the 6th Call for the Post-Investment Grants Project "Sustainable Land Management".	
L.2	Within the Registry	Support provided SupportType Amount Comment Date	No records to display.