Technology Fact Sheet

Sector	Agriculture
Adaptation needs	Moldova is highly vulnerable to climate variability and change[1]. According to a range of studies, including Moldova's Second National Communication (SNC) under the United Nations Framework Convention on Climate Change (UNFCCC)[2] and the National Human Development Report (NHDR, 2009)[3], the impacts of climate change are expected to intensify as changes in temperature and precipitation affect economic activity. Furthermore, socio-economic vulnerability to these changes is high. Moldova is one of the least advanced countries in the region – in 2005, Moldova had the fourth lowest Human Development Index out of 20 countries in the region[4]. The economy was in decline before 1991, a process that was intensified with separation from the USSR[5], and Moldova's economy suffered during the recent economic crisis. The impacts of climate change on agriculture are of particular concern – agriculture is a major source of income in Moldova, where more than half the population lives in rural areas and about one third of the labour force is employed in agriculture.[6] The socio-economic costs of climate related natural disasters such as droughts, floods and hail are significant and both their intensity and frequency are expected to further increase as a result of climate change. During the period 1984-2006, Moldova's average annual economic losses due to natural disasters were about US$61 million, or 2.13 percent of national GDP. More recent events have had a significant impact: the 2007 drought caused estimated losses of about US$1.0 billion; the 2008 floods cost the country about US$120 million.[7] The most recent floods in 2010 are estimated to have had an adverse economic impact on GDP of about 0.15 percent, with total damage and losses estimated at approximately USD 42 million. The floods primarily affected rural and agricultural regions of the country[8].
Technology Name	**Climate insuranse (CI): named-peril (NPCI) and multi-peril crop insurance (MPCI), and Index-based Insurance (II)** [i] **Large scale technology available in the short term**

[1] National Adaptation Strategy for the Republic of Moldova. Draft, 2 May 2011. 67p.
[2] Second National Communication of the Republic of Moldova under the United Nations Framework. Convention on Climate Change / United Nations Environment Progr.; coord. Violeta Ivanov, George Manful. Synthesis Team: Vasile Sorpan, Marius Taranu, Petru Todos, Ilie Boian. Ch.: "Bons Offices" SRL, 2009. 316 p.
[3] UNDP, 2009/2010 National Human Development Report, "Climate Change in Moldova: Socio-economic Impact and Policy Options for Adaptation.
[4] Namely 20 Central and Eastern European (CEE) and Commonwealth of Independent States (CIS) countries.
[5] Second National Communication, 2009.
[6] UNDP, 2009/2010 National Human Development Report, "Climate Change in Moldova: Socio-economic Impact and Policy Options for Adaptation.
[7] World Bank, "Project Appraisal Document on a Proposed Credit to the Republic of Moldova for a Disaster and Climate Risk Management Project", July 6, 2010.
[8] Government of the Republic of Moldova. "Post Disaster Needs Assessment, Floods 2010." Supported by the European Union, the United Nations, and the World Bank, with the support of the Global Facility for Disaster Reduction and Recovery (GFDRR), 2010.

How this technology contributes to adaptation	Climate has become an urgent issue on the development agenda. There is a high degree of interest in the potential role of CI in agricultural adaptation to climate change. Climate change is expected to give rise both to changes in the average agro climatic conditions for growing different crops and to increases in the variability of weather, with more frequent or extreme weather events. Adaptation to these changes is built on actions to increase resilience and reduce risk (e.g. appropriate crops, varieties and cropping patterns; irrigation; and soil and farm management techniques). In spite of these actions, risks remain or will increase (particularly to extreme weather events). CI can support appropriate climate change strategies, but it should not be seen as a way to avoid taking proper adaptation measures; nor should CI be seen as replacing other measures that address the effects of climate change.
Background/Notes Short description of the technology option	Moldova was a part of the Soviet Union until 1991. The subsidized agricultural insurance system was available in the whole country. Agricultural insurance was offered on mandatory basis by the state Insurance company "Gosstrakh". After the independence of the country, the agricultural insurance almost stopped. In 2004 the national parliament adopted a Law on Agricultural Insurance. Subsidized agricultural insurance was implemented in 2005. The law defines the basic features of the subsidized agricultural insurance, including the premium subsidies. The farmers pay only their share of the premium due on the insurance policy. The rest is paid by the government directly to the insurance companies. In practice the insurers receive the subsidized share of the premiums from the government within 2 to 3 weeks after the sales of the contracts (4-week term is established by the Law on Agricultural Insurance). The government subsidizes premiums on most crops, fruits, vegetables, and grapes. Livestock insurance is also subsidized. **Agricultural Insurance Products Available** The Republic of Moldova's insurance companies at the moment offer named-peril (NPCI) and multi-peril crop insurance (MPCI) products for additional information and description see (Annex A: Table 1 and Box 1). Farmers can choose the perils to be covered by the subsidized MPCI contract. The MPCI product differs from the traditional understanding of MPCI insurance because the farmer can select the list of perils covered. MPCI that indemnifies yield losses on an individual farm basis is subject to problems of adverse selection (the highest risk farmers insuring) and moral hazard (farmer influence over yield-based loss assessment, which is difficult for the insurer to control). High administrative and loss adjustment costs are incurred in operating MPCI. It requires significant investment in monitoring farm yields to prevent higher payments than those losses actually incurred by

	the farmer. Furthermore, MPCI has large correlated risks, so it is exposed to extremely high potential claims in adverse years. International reinsurers are reluctant to provide reinsurance for MPCI, particularly for new and unproven programs, and if available**,** costs are high. Experience internationally indicates that it is technically extremely difficult to insure farm-level crop yields from losses caused by any number of natural perils. Massive and unsustainable levels of government subsidies may be needed to support multiple peril crop insurance[9].
Implementation assumptions, How the technology will be implemented and diffused across the subsector	**Agricultural Insurance Market Structure** Subsidized agricultural insurance is offered only by private insurance companies. Currently, two companies participate in the program, but the biggest market share for last 5 years (about 75%) belongs to the MOLDASIG insurance company (Annex A: Figure 1). The insurers offer both crop and livestock insurance services. Data on voluntary unsubsidized agricultural insurance is insignificant. **Delivery Channel** Insurance agents are the main delivery channels. Insurance brokers are the second most important delivery channel. Banks and other finance institutions as delivery channels are marginal. There are no specific organizations in the Republic of Moldova for delivering agricultural insurance services to small and marginal farmers. **Voluntary vs. Compulsory Insurance** Crop and livestock insurance in the Republic of Moldova is voluntary. There are no mandatory requirements on agricultural insurance though the financial institutions might require insurance policy as collateral**.** **Types of Public Support for Agricultural Insurance** The Government of the Republic of Moldova subsidizes agricultural insurance premiums. The premium subsidy in 2011 was 60% of the OGP premium for perennial crops, sugar beet and vegetables. For insurance of other crops as winter wheat, barley, sunflower, maize, soybean, winter rape and livestock premium subsidies were 50%. The farmer should pay his share of the insurance premium when the insurance contract is signed. The rest of the premium is paid by the Government directly to the insurance company. The insurance premium paid on agricultural insurance contracts is exempt from taxes.

[9] WB Report, 2007. Rural Productivity in Moldova – Managing Natural Vulnerability. 23 May 2007, p.107.

Costs	**Calculation of the sum of insurance and premium rates** The sum of insurance (SI) is calculated using the following formula: ***SI = ensured area x planned productivity x production forecast price*** The premium rates (see Annex A, Table 2) are calculated as percentage of the risk covered by the underwriters based on the information provided by the farmer. The cost of the agricultural insurance for farmers ranges and depends largely from crop culture and number of insured risks. For example, insurance premium paid by the insured, lei per 1 ha, for such individual risk as winter frost, can range from 94 lei (winter wheat) to 420 lei (grape) (see Annex A, Box 2), or in case of excessive drought from 140 lei (soy bean) to 1400 lei (vegetables) (see Annex A, Box 3). Further, information on calculation of the cost of agricultural insurance for farmers - insurance premium paid by the insured (in red) and maximum amounts of the insurance indemnity, lei per 1 ha for different crops yield and risks in 2011 is revealed in Annex A, Box 2 and 3. Livestock insurance is a multi-peril product where the client can choose the perils to be insured. The insurance companies insure livestock, sheep, goats, bees, and fish. Usually a livestock insurance contract includes perils such as weather perils, fire, epidemic diseases, accidental loss, and unlawful actions of third parties (theft, robbery, etc.).
Impact Statements - How this option impacts the country development priorities	
Country social development priorities	There are numerous reasons why risk transfer out of developing countries is important. Natural disasters impede the development process, push households into poverty, and drain fiscal resources of developing countries. Many of these natural disasters are directly tied to extreme weather events. Bad weather events have devastating impacts on agriculture. Of the 1.3 billion people in the world who are living on less than US$1 per day, nearly three-fourths depend on agriculture for their livelihood. In many countries around the world, agricultural development will still clear the way for overall economic development of the broader economy[10]. ***Access to formal risk financing instruments, such as insurance, can help farmers transfer excessive losses to a third party (such as an insurance company), thus stabilizing household income, facilitating their access to credit, and ultimately enhancing their livelihoods.***

[10] WB, Report No. 32727-GLB Managing Agricultural Production Risk Innovations in Developing Countries, May 2005, p.86.

Country economic development priorities – economic benefits	The management of crop production risks is an issue of fundamental importance to agricultural economies. Because of the random nature of production conditions (e.g., weather, pests, diseases), agricultural producers face an array of risks that may influence their level of output per acre from year to year. Management of such yield risks has long been an important issue for producers as well as for policy makers. ***Crop insurance is additional mechanism for the management of the risks associated with random yield shocks once all cost-effective risk mitigation strategies have been implemented; and disaster assistance effort.*** ***Although, as a rule insurance multi-peril schemes are not sustainable without heavy government subsidies.***
Country environmental development priorities (Environmental benefits)	"*Resilient is the flip side of vulnerability - a resilient system or population is not sensitive to natural hazards, climate variability and change and has the capacity to adapt*" (IPCC, 2001; Thywissen 2006[11]) or more precisely: "*Resilience is the capacity of a system, community or society potentially exposed to hazards to adapt by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organizing itself to increase its capacity for learning from past disasters for better future protection and to improve risk reduction measures*." (UN/ISDR, 2004[12]; Thywissen 2006). ***Assist to constructing a resilient to climate change social-environmental system capable of anticipating, adapting to and coping with uncertainties and unexpected extreme events without losing its sustainable stability, performance and regenerative ability.***
Social benefits	See above.

[11] Thywissen, K. (2006): Components of Risk. A Comparative Glossary. SOURCE No.2/2006. UNU-EHS, Bonn.
[12] UN/ISDR (United Nations International Strategy for Disaster Reduction) (2004): Living with Risk. A Global Review of Disaster Reduction Initiatives. 2004 version. United Nations, Geneva, p. 430.

Other considerations and priorities (such as market potential)	**Insurance Penetration Rate** In 2007 private insurers signed 145 crop insurance contracts under the subsidized program. The participation rate is low. Only 3.7% of the crops (by area), or 72,900 ha, are insured (see Annex A, Table 3)[13]. According to the AIPA[14] in 2010 were completed only 122 crop insurance contracts under the subsidized program in agriculture to total 9.9 ml lei. As in previous years this type of insurance most receives large producers. Small producers, especially GŢF (21.3%) were assimilated 8.6 percent of the sum allocated, or 860.2 thousand lei. At the same time without financial coverage remained 127 applicants because of a deficiency in this subsidized measure being 8.9 ml lei. For comparison, in 2009 for this direction were used 25.5 ml lei from which over 2 ml were offered as compensation to 58 GŢF (individual farmers). **Financial Performance** The loss ratio data is very volatile, ranging from 1.9% in 2006 up to 126.7% in 2009 for first insurance company MOLDASIG and 21.3% in 2008 up to 76.3% in 2009 for second insurance company MOLDCARGO (see Annex A, Table 4 and Figure 2).
Capital costs (per facility)	Don't require capital investments for farmers.
Operational and Maintenance costs (per facility)	**Cost of Agricultural Insurance Provision** According to WB report[15] the average delivery, loss adjustment, and administration costs amount to a total of 5% of the original gross premium (OGP). Marketing and acquisition costs are 3%, and loss adjustment costs are 2%. The insurance companies explain low operating costs by their good knowledge of clients and small size of the country.
Daily supply capacity per facility	Not applicable.

[13] WB Survey, 2008. Government Support to Agricultural Insurance: Challenges and Options for Developing Countries, co-authored by Olivier Mahul and Charles Stutley. 275p.

[14] AIPA (Agenția de Intervenție și Plați pentru Agricultură) http://www.aipa.md/index.php/lista-beneficiarilor/31-lista-beneficiarilor-2006-2009/177-lista-beneficiarilor-de-subventii-acordate-pentru-asigurarea-riscurilor-in-agricultura-2006-2009

[15] WB Survey, 2008. Government Support to Agricultural Insurance: Challenges and Options for Developing Countries, co-authored by Olivier Mahul and Charles Stutley. 275p.

Upscaling potential	**Issues and Options for Crop Insurance in the Republic of Moldova** The Republic of Moldova faces significant constraints in introducing crop insurance. These issues can be summarized as follows[16]: ▪ Farmers are suffering from other economic and structural difficulties, notably loss of market, low profit margins, and availability of inputs and infrastructure. In this respect, farmers may regard insurance as low on the list of their priorities for improving their economic circumstances. ▪ Insurance, as a mechanism, operates most effectively where it is linked to other measures to mitigate the farmer's situation (e.g. improving credit availability, market access, investment into machinery, irrigation equipment and so on). Insurance cannot operate effectively in isolation, and will be regarded as a cost by the farmer. Hence, any decision concerning the type and timing of introduction of crop insurance in Moldova has to be taken in the context of other initiatives for development of agriculture. The main hazards causing widespread crop loss in Moldova are reported as drought (for rainfed crops), hail, and frost (especially for vines). Winter frost can also cause widespread damage of autumn-sown crops. ▪ The insurance sector in Moldova is poorly developed, especially in rural areas, and there is a lack of insurance awareness amongst farmers. MOLDASIG and MOLDCARGO are the only two insurance companies involved in crop insurance, and it requires state subsidies (see above). ▪ There is a structural division between large, former state farms and small private farms. Insurance should be designed so that all farmers can benefit from coverage. ▪ Financial capacity to manage major national systemic risks, such as drought, is beyond the capacity of the insurance sector in Moldova and would be dependent on international reinsurance. Such reinsurance is unlikely to be available to support a traditional individual-farmer MPCI. It may be more available for an index program or for conventional crop hail insurance. ▪ The legislation that is in force provides a framework for subsidized, individual, multiple-peril crop insurance. *As an alternative to MPCI, could be recommended the piloting of privately run index based weather insurance for broad-based threats like drought and frost.*

[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/**

[16] WB Report, 2007. Rural Productivity in Moldova – Managing Natural Vulnerability. 23 May 2007, p.107.