




Climate Change & Agriculture in Moldova

Awareness Raising and Consultation
Workshop

October 28, 2009 Chisinau

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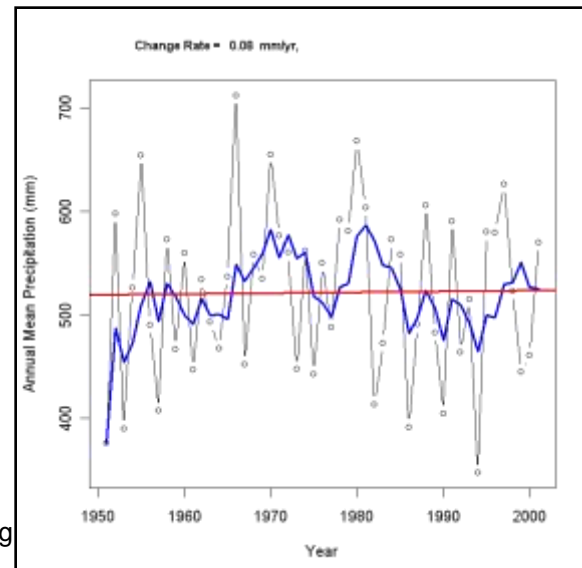
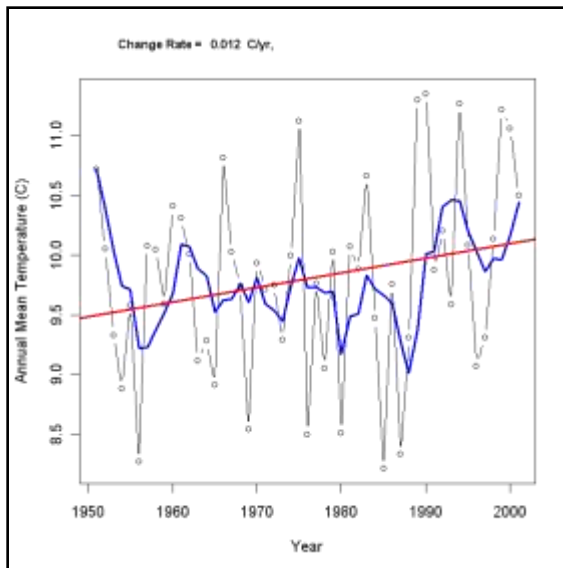
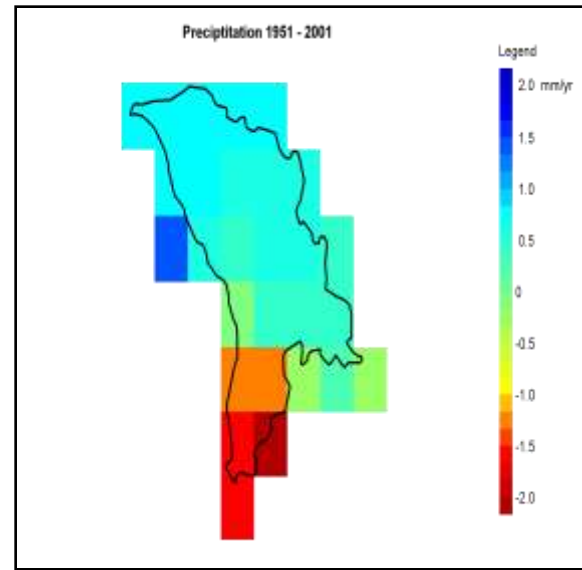
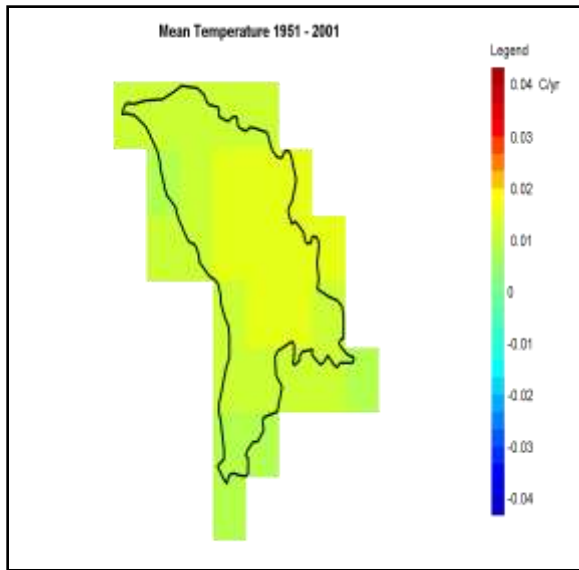




Why Should You Care about Climate Change?

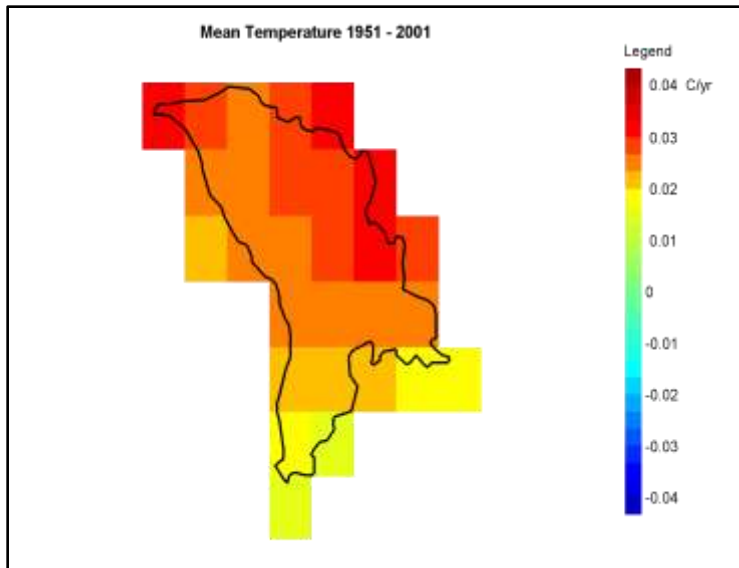
- Climate change and variability are already happening in Moldova
- Climate change in Moldova will accelerate in the future
- Business as usual approach will have negative impacts for agriculture
- NOW is the time to start developing and implementing adaptation responses

Moldova's Climate Is Already Changing



Source:
www.climatewiz.org

Seasonal Trends Provide a Clearer Signal

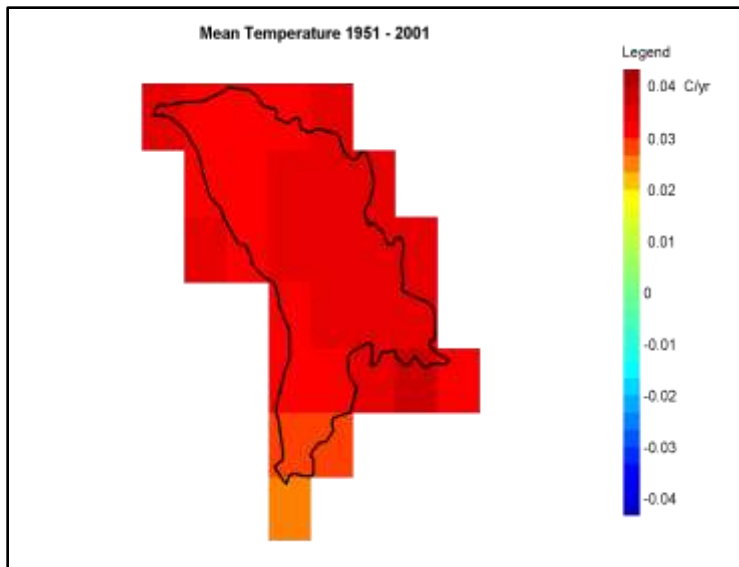
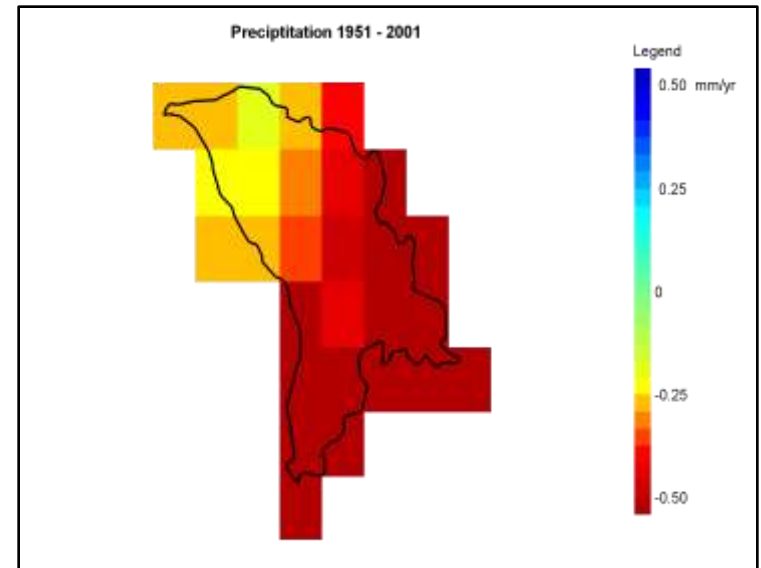


WINTER

Temperature



Precipitation

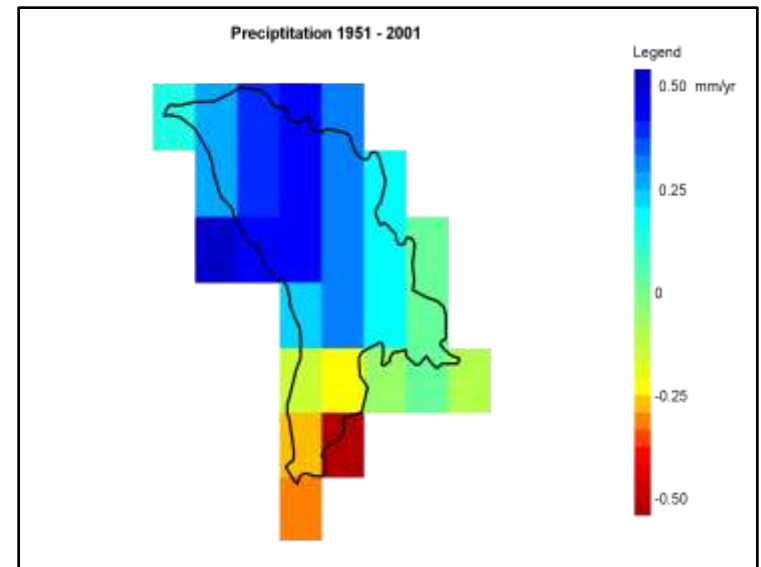


SPRING

Temperature



Precipitation



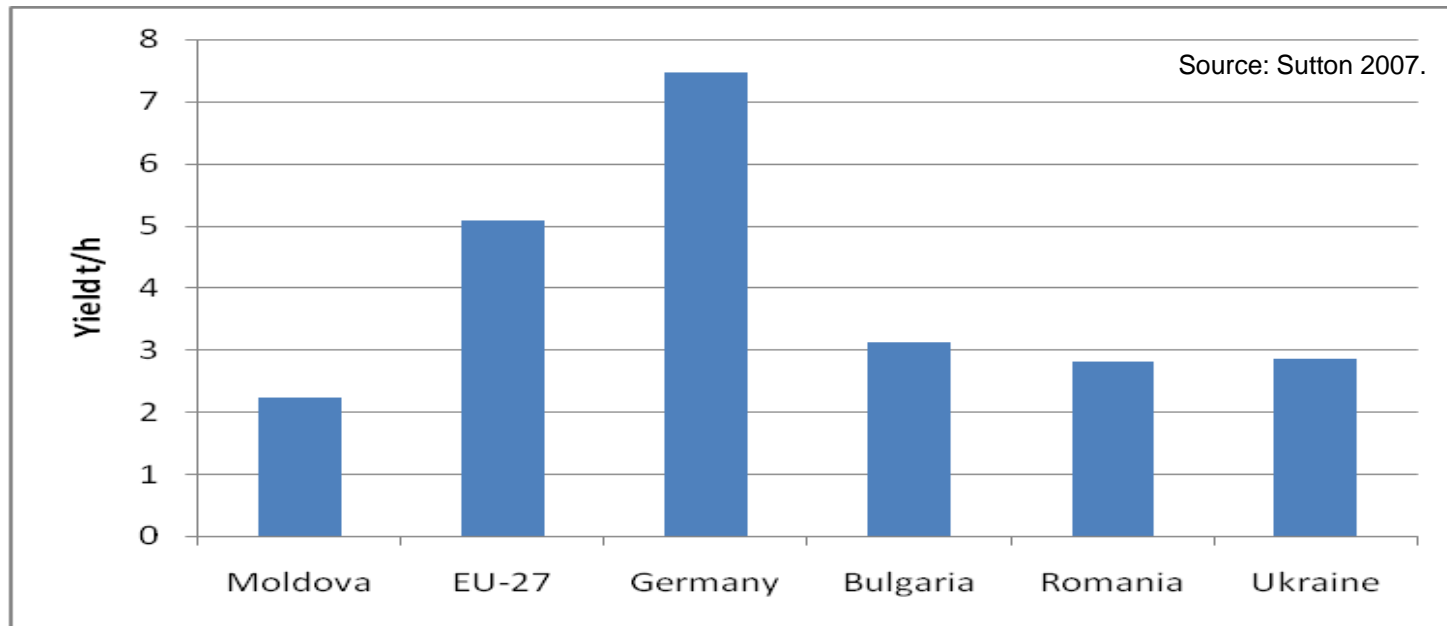
Source:
www.climatewiz.org

Increasing Frequency and Severity of Drought


- Major changes observed in the last 2 decades
 - Record drought in 2007 – estimated losses to agriculture of US \$1 Billion
 - From 1834 to 2000 the probability of catastrophic drought has increased from 11% (1 in 9 year event) to 41% (almost a 1 in 2 year event)
- (Source: National Hydrometeorological Center, 2007)

The Adaptation Deficit

Comparative Average Wheat Yields, 2006



- The productivity gap between potential yields and actual yields is significant across the region
- Countries that stand to benefit from climate change are poorly positioned to do so

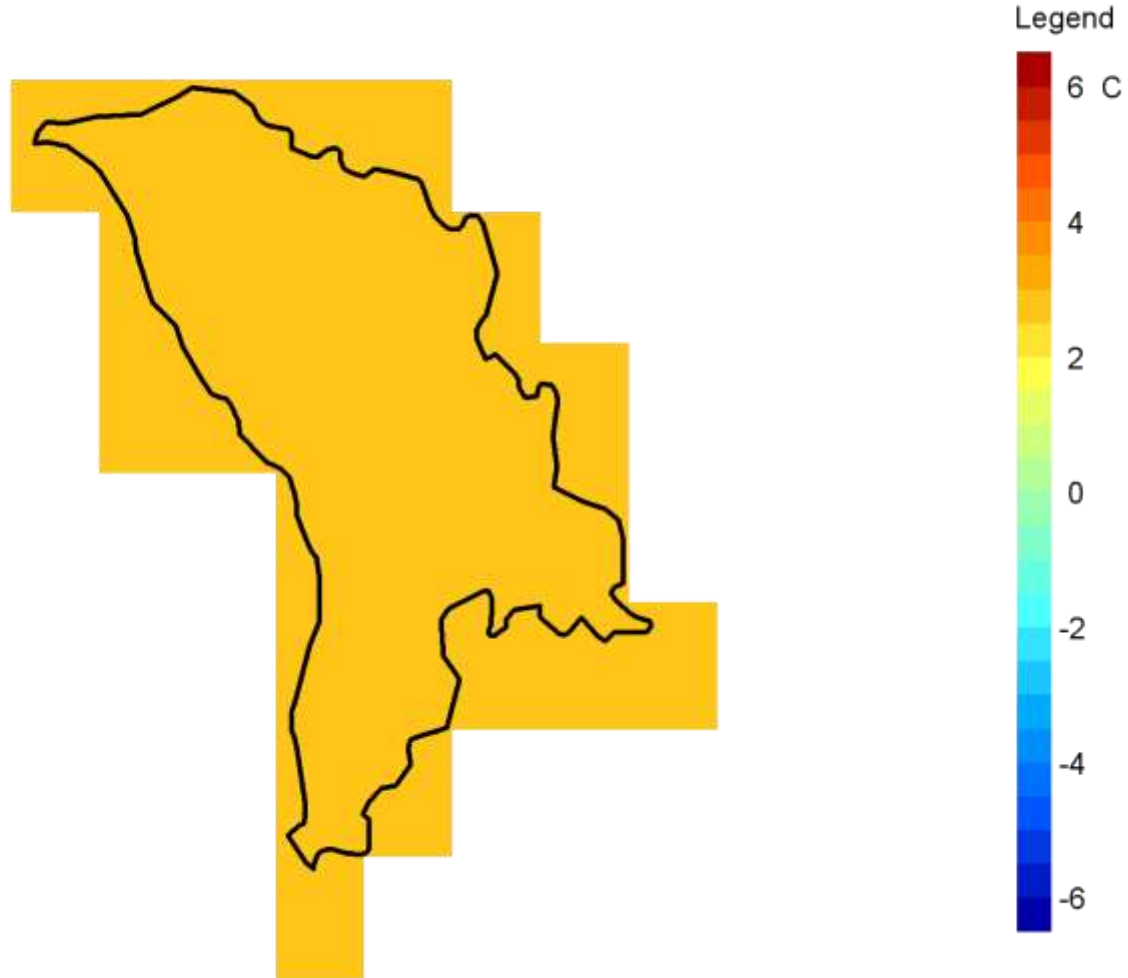


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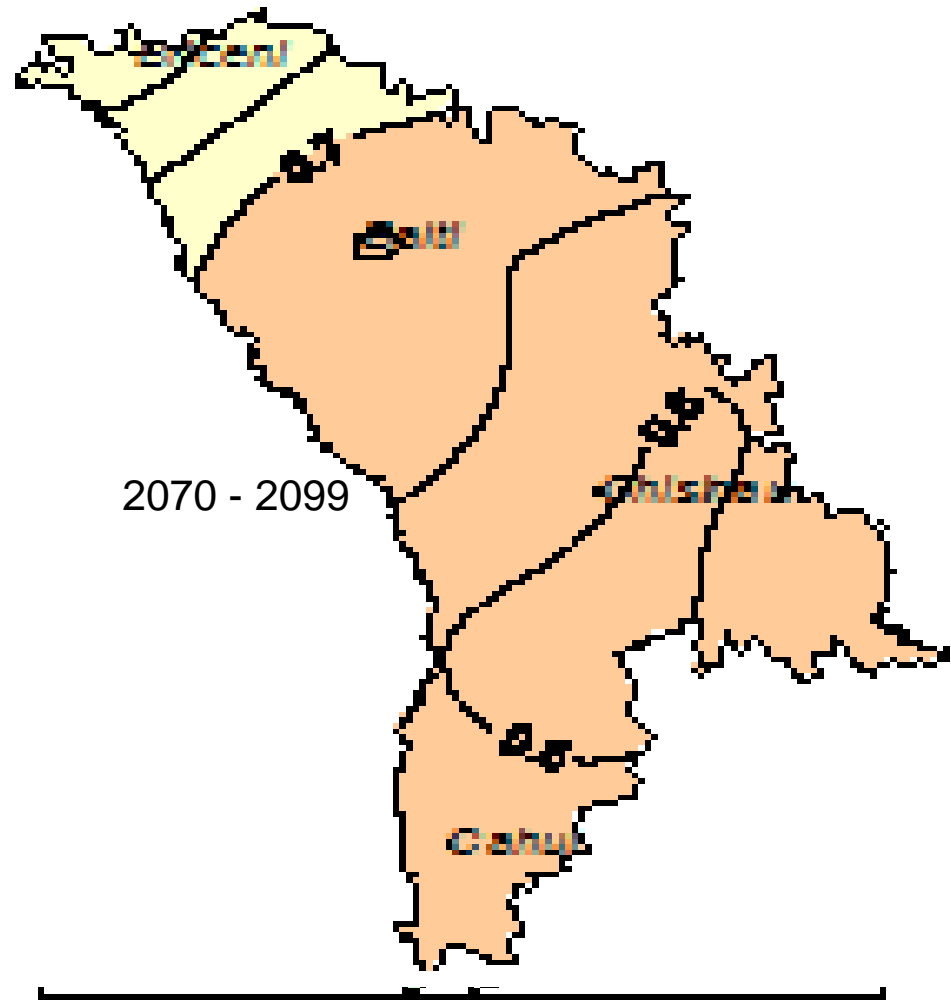
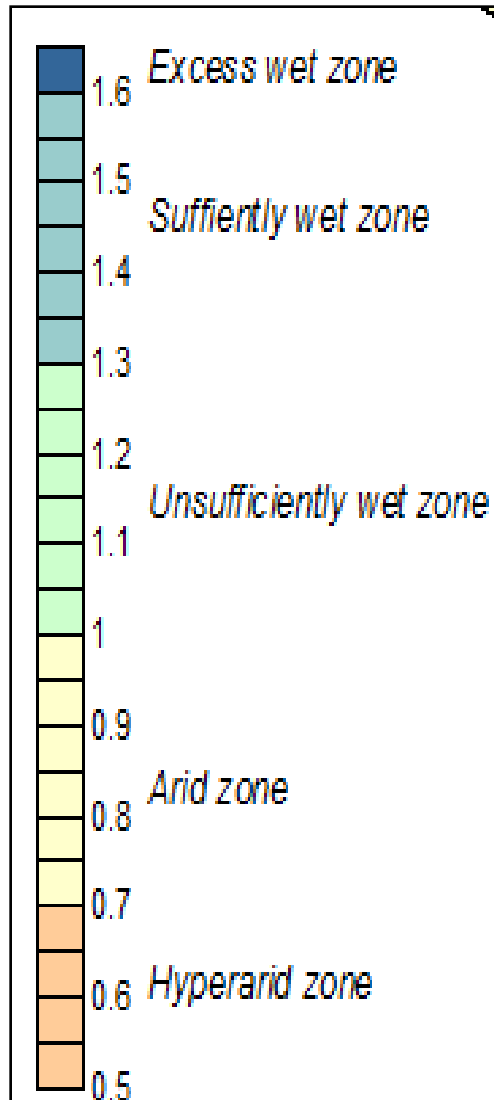
**Climate change in Moldova will
Accelerate in the Future**

Temperatures will Increase Significantly

a2 Mean Temperature Departure 2041 - 2060



Moldova's Climate is Projected to Become Hotter and Drier



Source: National Human Development Report, 2009

Projected Climate Risks for Moldova 2040-69

- 3.4⁰C increase in mean annual temperature, with the greatest warming in winter & autumn
- Decline in mean annual precipitation by 6.8%
- Decline in summer (19.3%) and autumn (16%) precipitation

The Downside Risks to Agriculture are Significant

Continental South Zone	Detail of Risk/Opportunity	Magnitude	Likelihood	Priority
RISK	Crop area changes due to decrease in optimal farming conditions	LOW	HIGH	MEDIUM
	Crop productivity decrease	LOW	HIGH	MEDIUM
	Increased risk of agricultural pests, diseases and weeds	HIGH	MEDIUM	HIGH
	Crop quality decrease	LOW	HIGH	MEDIUM
	Increased risk of drought and water scarcity	HIGH	HIGH	HIGH
	Increased irrigation requirements	HIGH	HIGH	HIGH
	Soil erosion, <u>salinization</u> and desertification	HIGH	HIGH	HIGH
	Deterioration of conditions for livestock production	MEDIUM	LOW	LOW
OPPORTUNITY	Crop distribution changes leading to increase in optimal farming conditions	HIGH	MEDIUM	HIGH
	Lower energy costs for glasshouses	LOW	HIGH	MEDIUM

Why Should You Care About Climate Change?



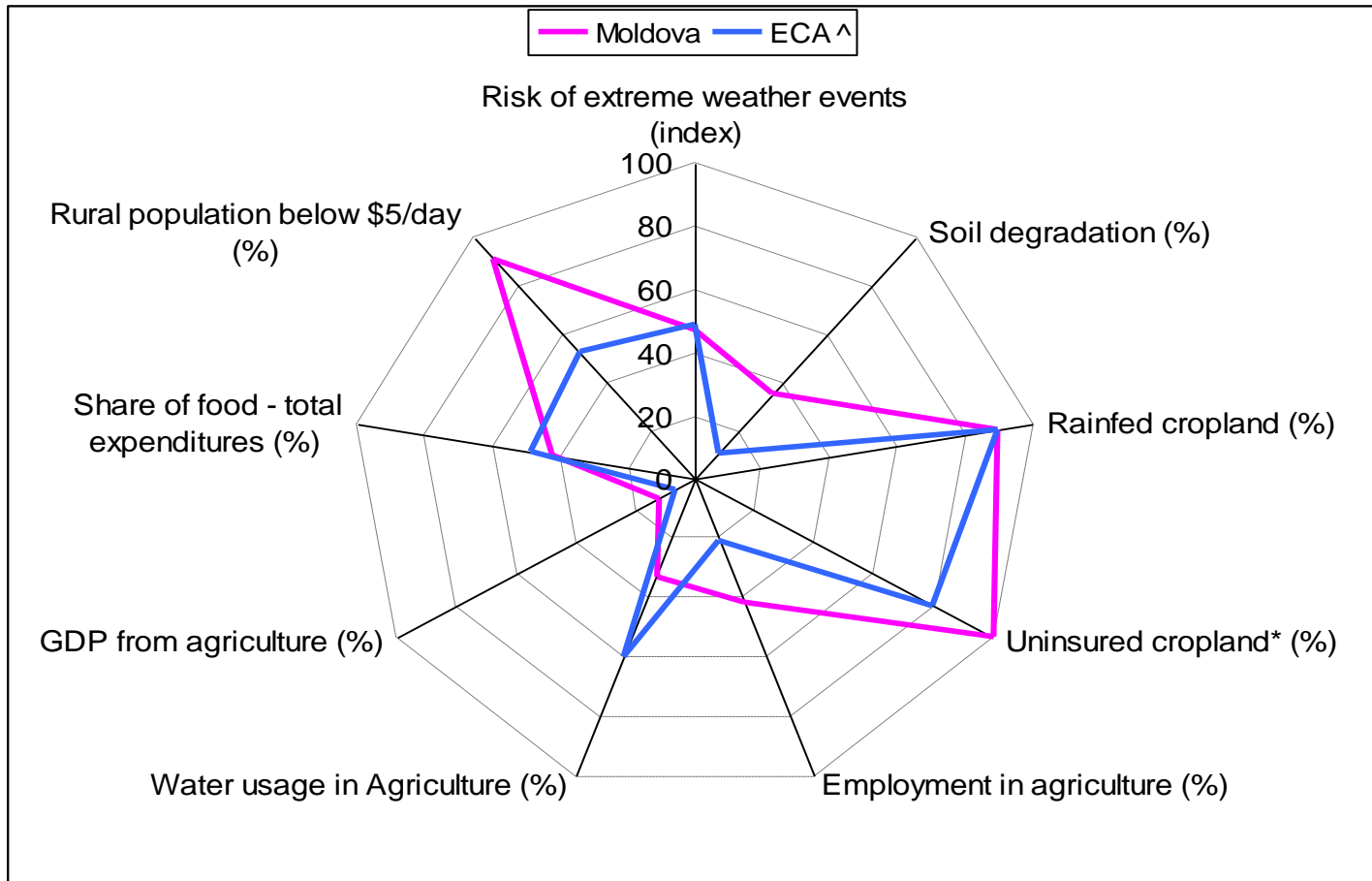
**“Business as usual”
will result in missed
opportunities and
negative impacts for
agriculture**

Agriculture & Moldova Are Highly Vulnerability to Climate Change

- Agriculture is a highly climate sensitive sector.
- Agriculture and related activities account for 30% of GDP and 40% employment → economically significant.
- Changes in temperature, precipitation, and frequency of extreme events → impact production, food security and livelihoods.
- Significant variation in vulnerability & adaptive capacity across the country

Moldova is Vulnerable on a Number of Fronts

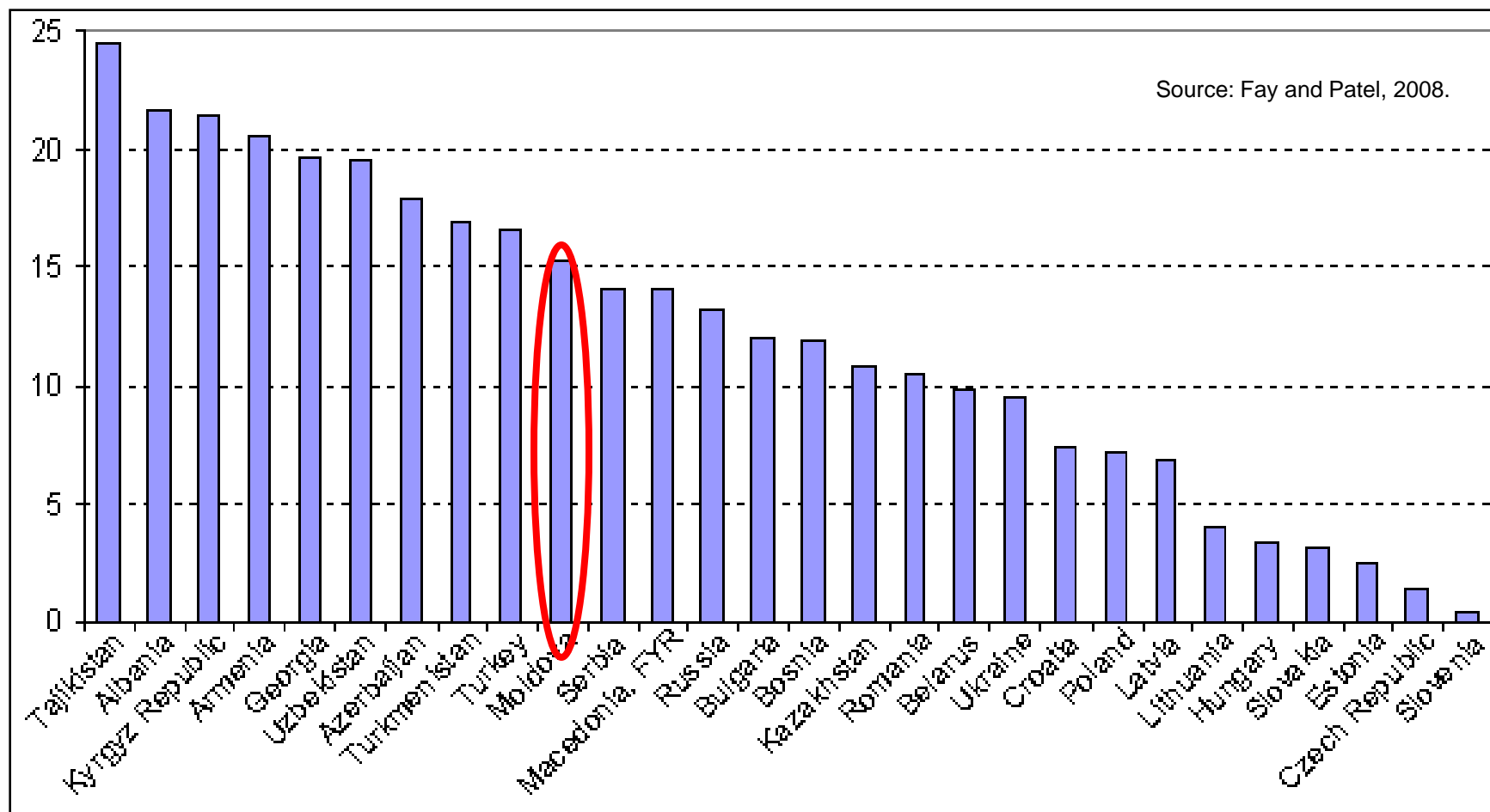
Moldova's climate change vulnerability exceeds the ECA region average for many factors



Sources: World Development Indicators 2008; FAO AGL 2005; Baettig, M. et al., 2007., ECA Databank.

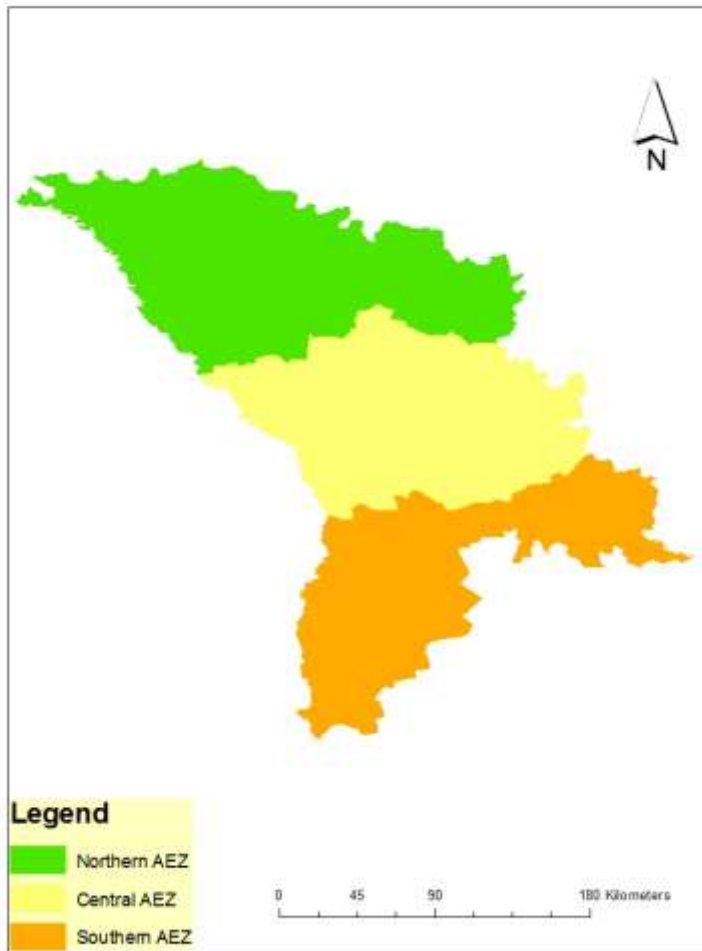
Moldova is Highly Vulnerable Compared to Many Other ECA Countries

Vulnerability Index is calculated by combining exposure, sensitivity and adaptive capacity indices



Some Agro-ecological Zones and Production Systems Are More Vulnerable than Others

Agro-ecological Zones of Moldova



Countrywide

- Increased risk of drought and other extreme events
- Projected climate shift to a dry sub-humid or semi-arid climate

Northern AEZ

- Reduced crop and livestock productivity.
- Increased risk of frosts on early flowering perennials.
- Longer growing season could provide new crop opportunities.

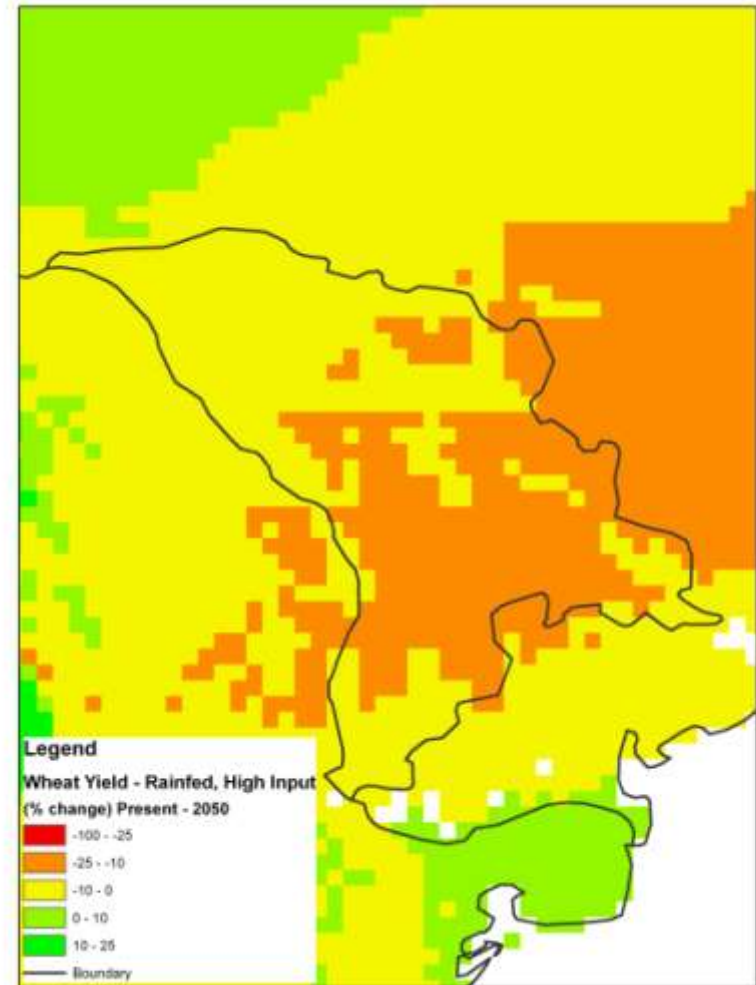
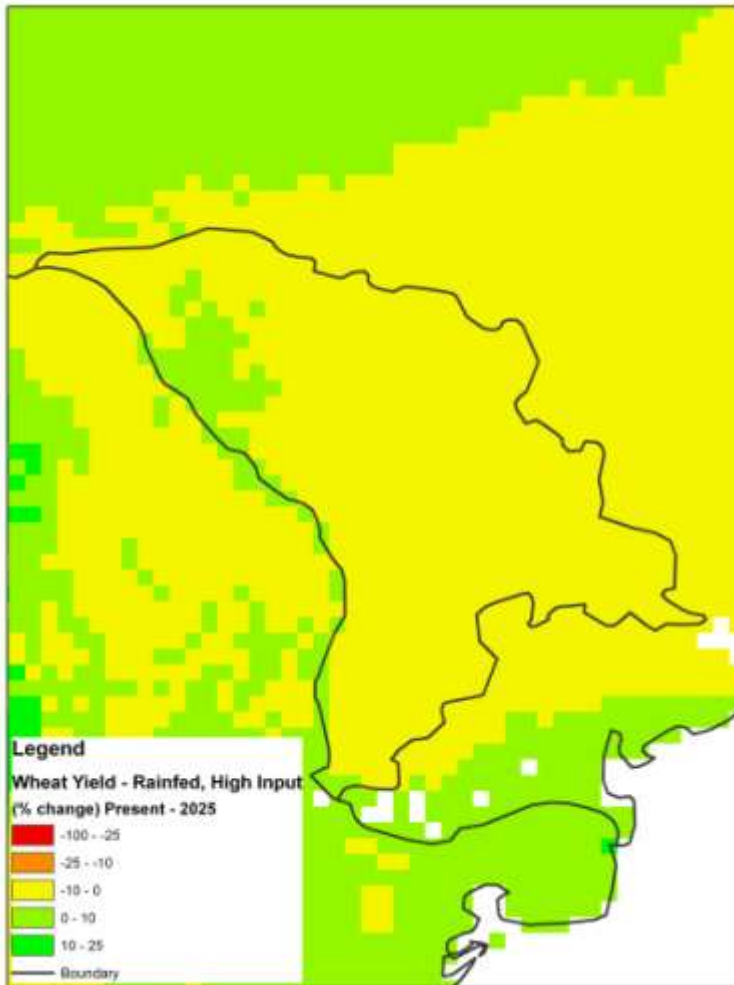
Central AEZ

- Significantly reduced crop and livestock productivity.
- Increased risk of frosts on early flowering perennials.
- Increased risk of agricultural pests, diseases and weeds.

Southern AEZ

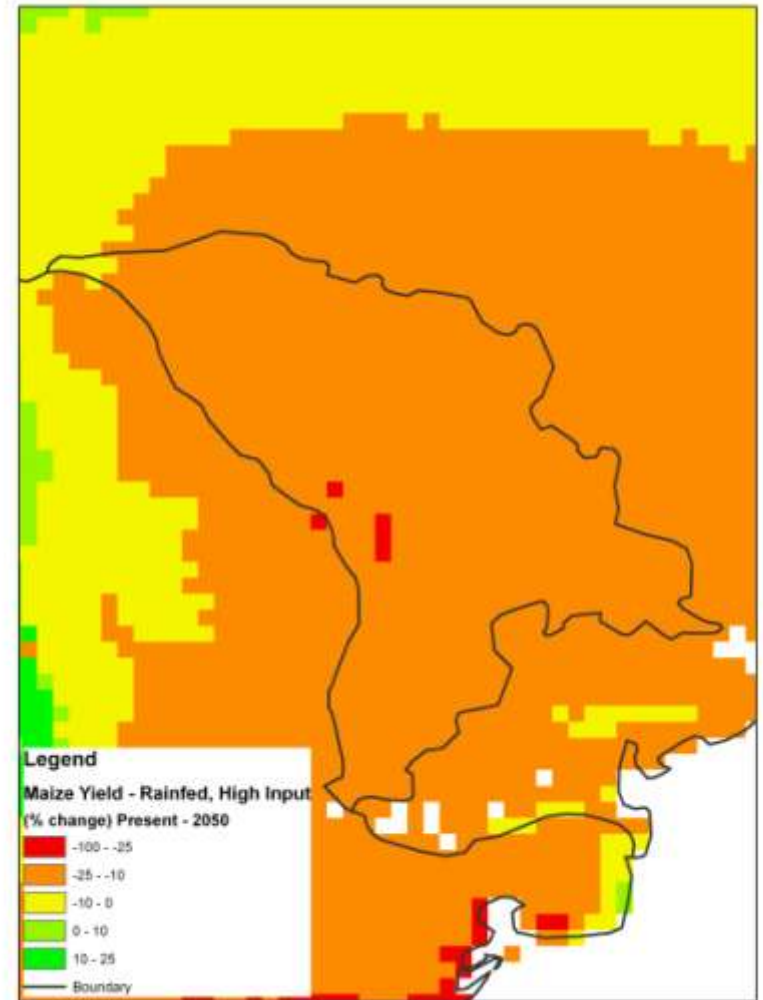
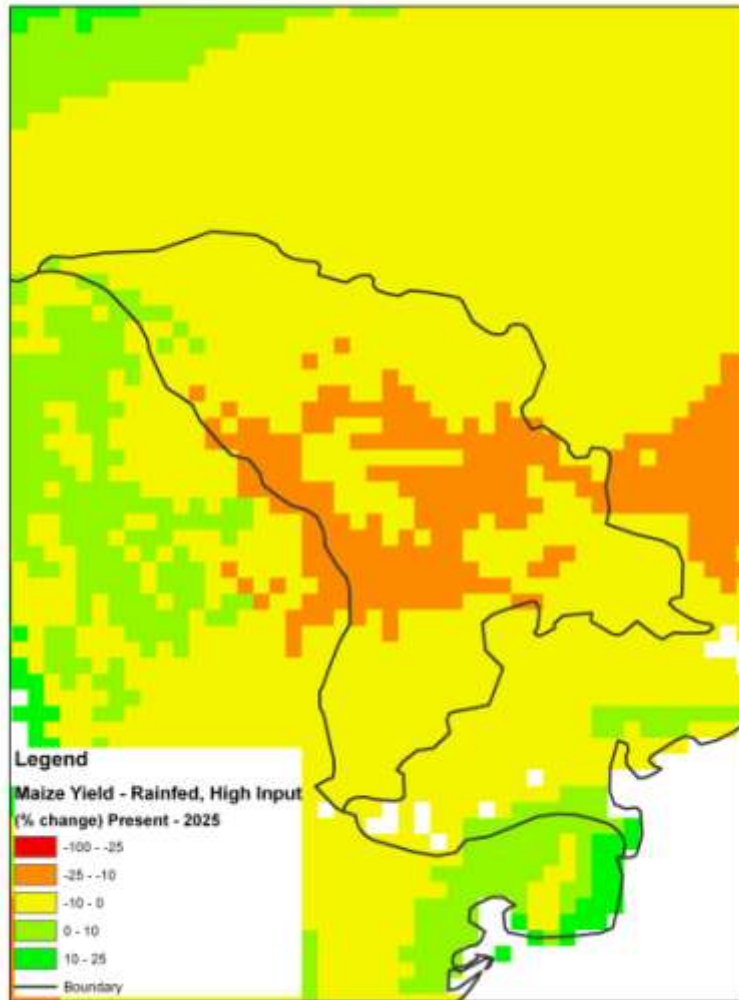
- Significantly reduced crop and livestock productivity.
- Increases risk of soil erosion and desertification.
- Crop area changes due to a decrease in optimal farming conditions.

Projected Wheat Yields Will Decline into the Future



Source: Fischer, G., et.al. 2007.

Projected Maize Yields Will Decline Even More



Source: Fischer, G., et.al. 2007.

Why Should You Care about Climate Change?

NOW is the time to start developing and implementing adaptation responses

Initial Steps Already Taken, But More to Do

- First National Communication, 2000;
- Second National Communication, 2009*;
- National Human Development Report, 2009*;
- Moldova is a leader in Clean Development Mechanism (CDM) Mitigation Projects
- National Strategy of Natural Hazards Mitigation and Climate Change

Moldova needs a consolidated strategy and action plan to meet the climate challenges facing the agriculture, forestry and livestock sectors

There is Increasing Global Focus on the Development of National Adaptation Strategies

- Moldova is a party to Article 4 of the United Nations Framework Convention on Climate Change (UNFCCC) that stipulates:

“All Parties shall formulate and implement measures to facilitate adequate adaptation to climate change”

- The 2009 EU White Paper on “Adapting to Climate Change” recommends to:

“Encourage the further development of National and Regional Adaptation Strategies with a view to considering mandatory adaptation strategies from 2012”

Adaptation Can Be Tackled from a Number of Directions

I. Management, Technical and Infrastructure Measures

- **Management:** crop variety, planting time, livelihood diversification, vaccination of livestock, adjusting stocking rates, fertilizer rates, etc.
- **Technical:** Switching to alternative crops, tillage practices, improved on-farm irrigation equipment, crop breeding programs, etc.
- **Infrastructure:** On-farm harvesting and storage of rainwater, animal housing, irrigation network rehabilitation, etc.

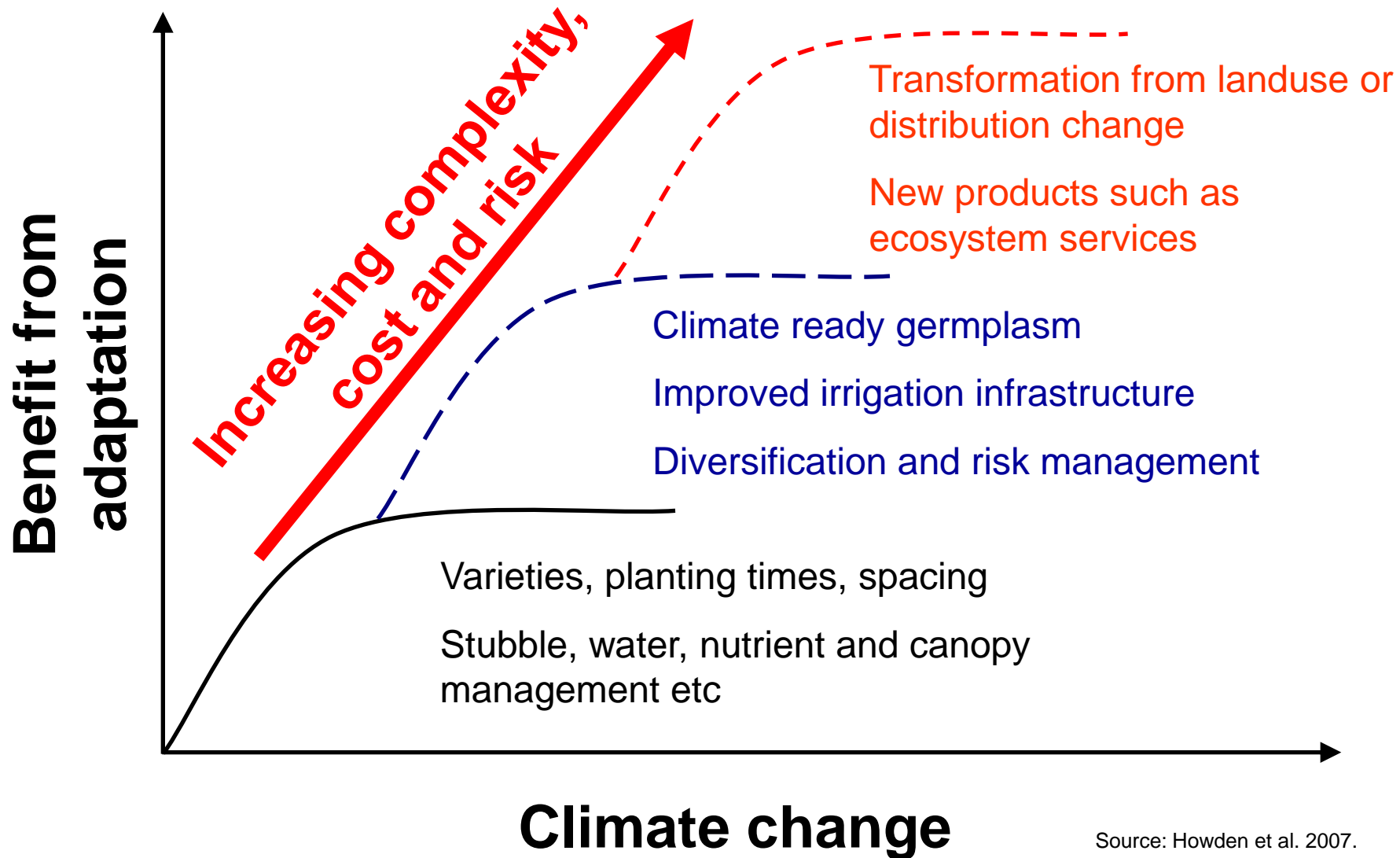
II. Institutional Measures

- Building institutional capacity via enhancing skills, knowledge, equipment, processes, networks, coordination, etc.

III. Policy Measures

- Non-distortionary water pricing, access to modern inputs, improved land markets, farm subsidy reform, climate index insurance, etc.

Adaptation has Long Investment Horizons – Action is Needed Now



Across Moldova there will be Agricultural Winners and Losers with Climate Change

- Potential agricultural winners and losers need to have a proactive strategy to take advantage of opportunities and to manage risks
- Need to change focus to include climate change adaptation in addition to the traditional seasonal weather focus
- The business as usual strategy will result in significant missed opportunities (for the winners) and higher downside risk and increased vulnerability (for the losers)
- Short term - practices and technology are available to manage climate variability and change.
- Long term – action needed now to develop adaptation strategies and integrated solutions

Agriculture Can Help to Mitigate Climate Change too



reducing emissions

increasing sequestration



Why Should You Care about Climate Change?

- Moldova is one of most vulnerable countries to climate change in the Europe and Central Asia Region
- Climate variability and change are already impacting Moldova and will accelerate in the future
- Business as usual approach will result in missed opportunities and negative impacts for the agricultural sector
- NOW is the time to start developing and implementing adaptation responses
- The World Bank has a program to support you in this

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