

Strengthening agricultural resilience against droughts in Uzbekistan: from crisis management to drought risk mitigation

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Drought impacts in Uzbekistan

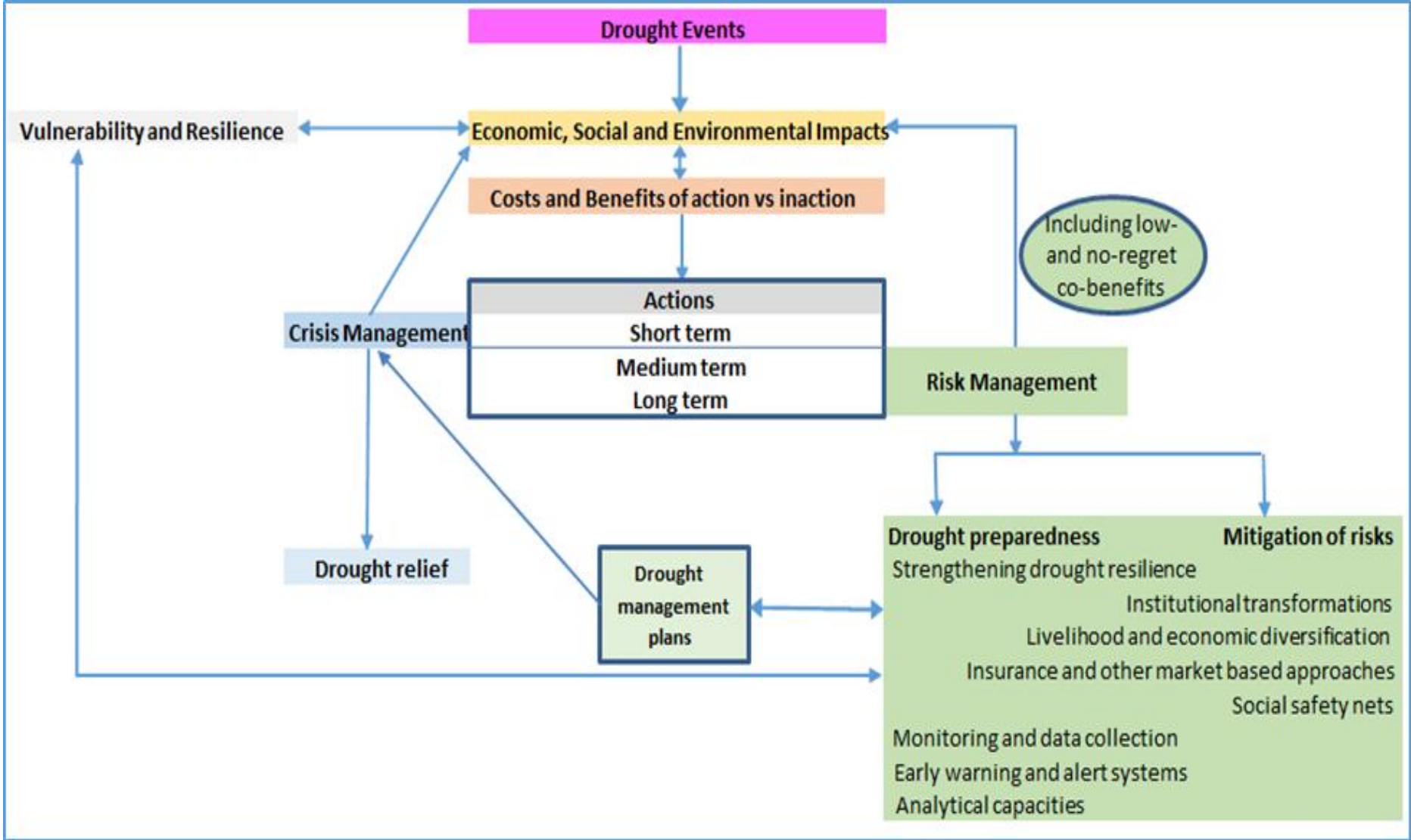
- Over the last decade, Uzbekistan faced several occurrences of extreme hydrological droughts, with crop yield losses of 50% to 75% in the worst affected areas (FAO 2017).
- During the drought in 2000-2001, cereals production declined by 10%, cotton production by 17% and rice production by 60%, resulting in about 130 million USD of losses (World Bank 2006).
- The biggest losses occurred in the downstream areas in Uzbekistan, where about 600,000 people were in need of food aid to the value of 19 million USD (World Bank 2006, FAO 2017).



Vulnerability to droughts

- Uzbekistan is located in arid and semi-arid areas vulnerable to frequent droughts (Gupta et al. 2009) and high inter-annual flow river variability (Dukhovny et al. 2008).
- The needs for irrigation water are growing rapidly, increasing the dis-balance between the availability of water and growing water demands (Cai et al. 2003).
- Increasing weather and river flow variability under the climate change could exacerbate the drought impacts (Mirzabaev 2013)

Building resilience to droughts: a conceptual roadmap



Source: based on Gerber and Mirzabaev (2017)

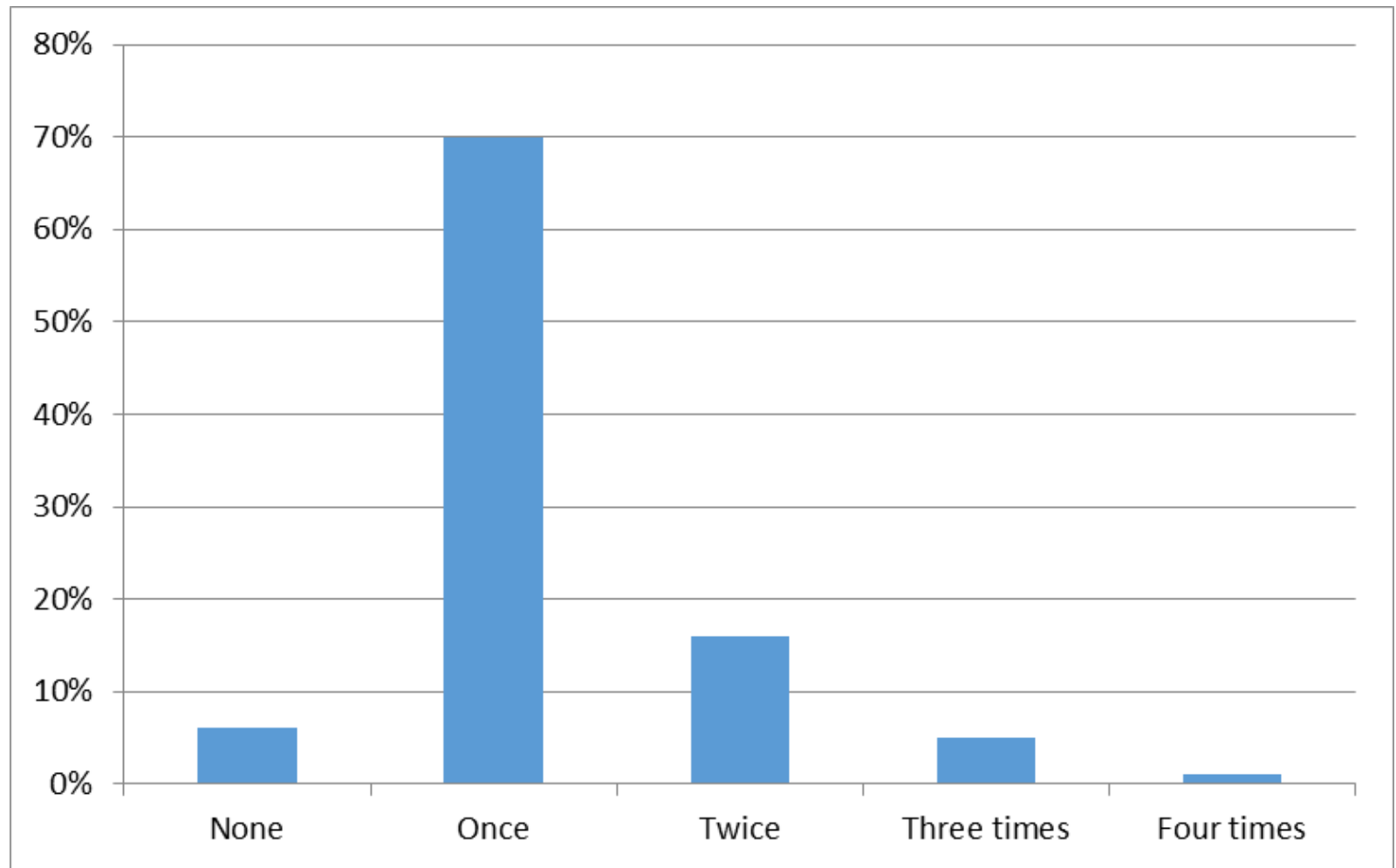
Methodology and Data

- Qualitative case study approach
 - reviewed drought-related literature and policies, assessed the potential of various alternative, technologies, institutional and policy options for drought risk management
 - analyzed a nationally representative farmers' survey
 - conducted expert interviews and discussions with various stakeholders

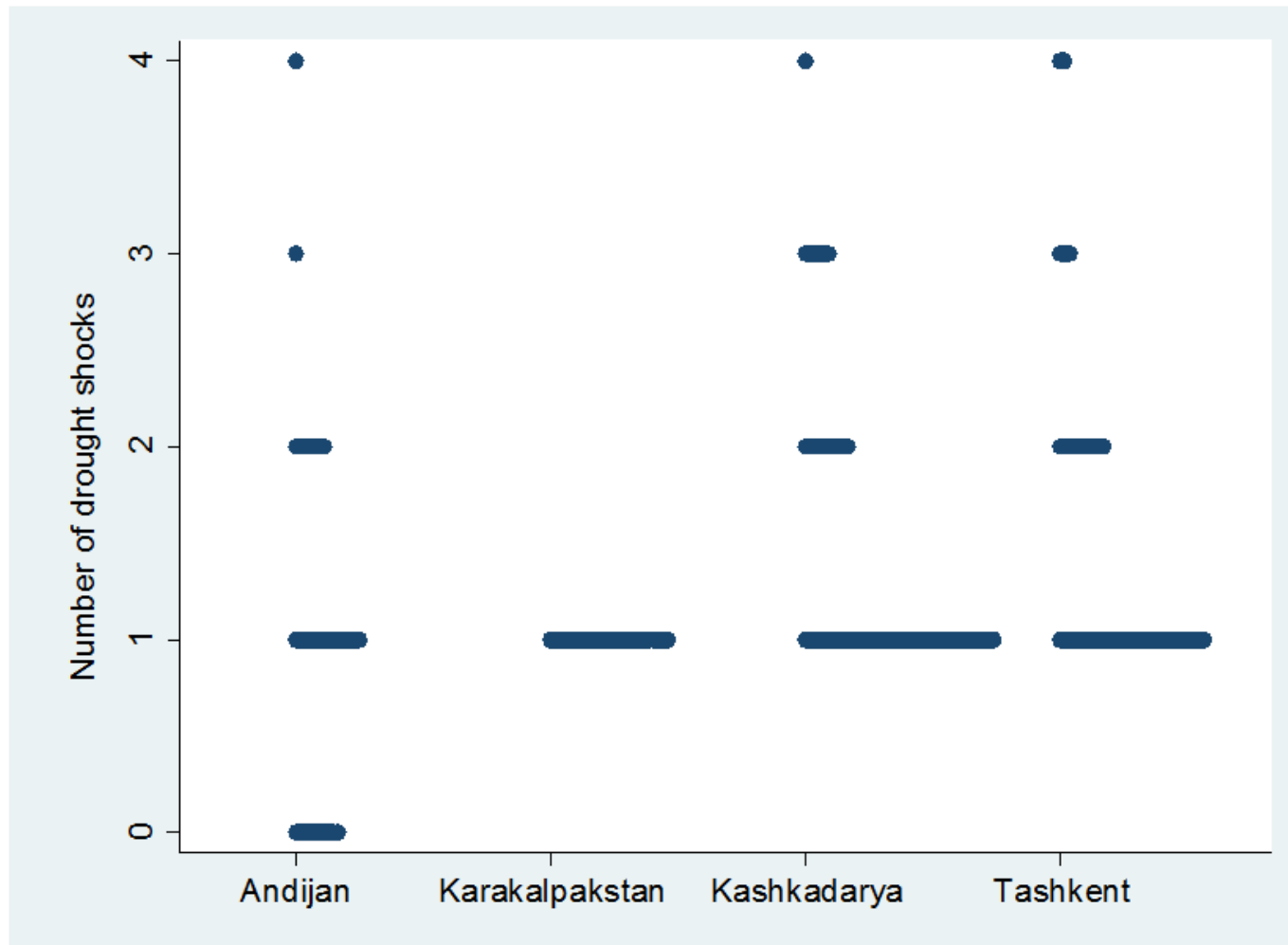
Drought shocks and farmer responses

Farmer categories by income	Drought shock		Took action	
	No	Yes	No	Yes
All farmers	6%	94%	63%	36%
Lower asset farmers (N=150)	9%	91%	79%	21%
Middle asset farmers (N=101)	6%	93%	70%	30%
Higher asset farmers (N=131)	2%	98%	40%	60%

Frequency of drought shocks, 2005-2010



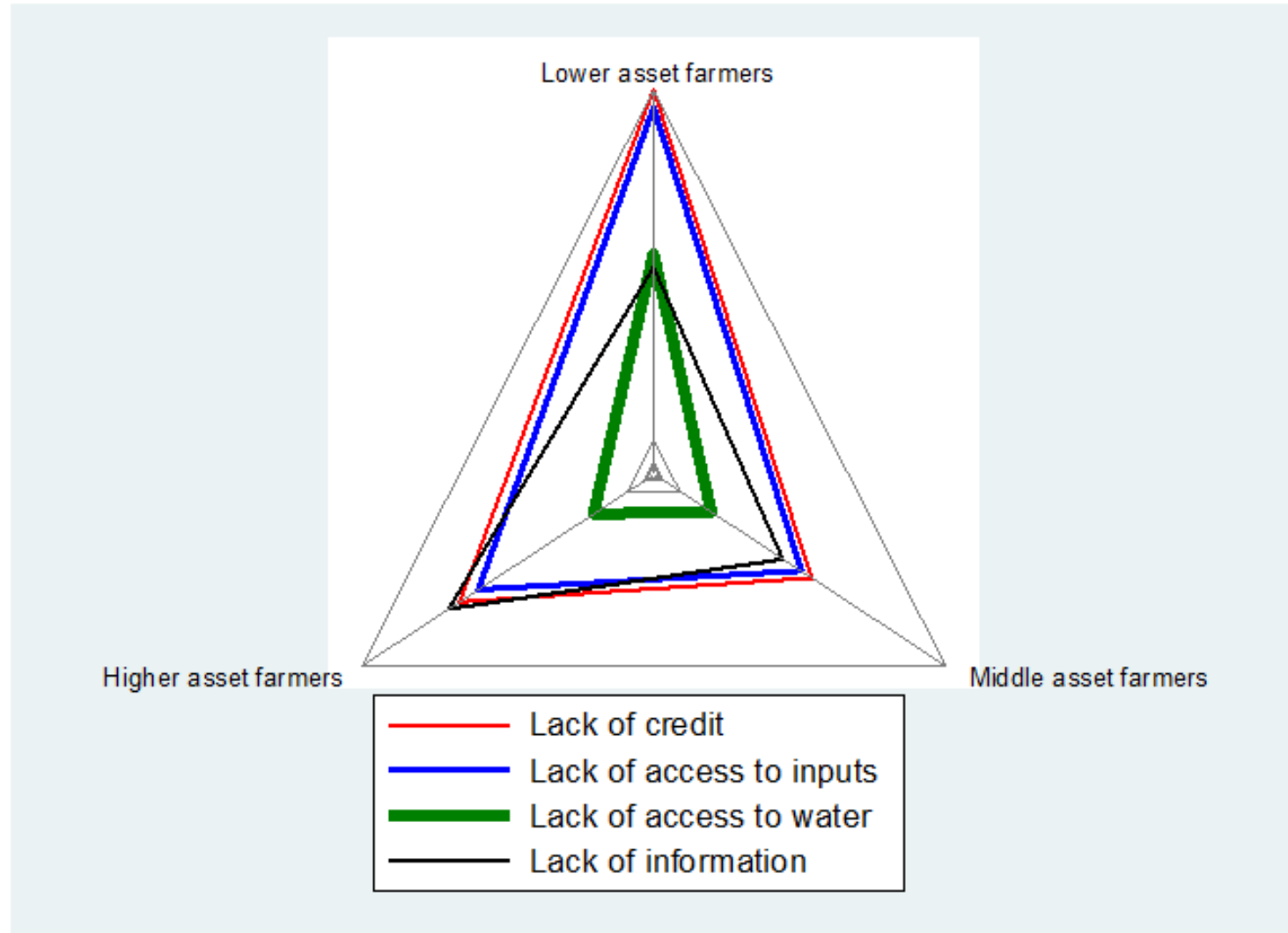
Drought experiences: upstream vs downstream



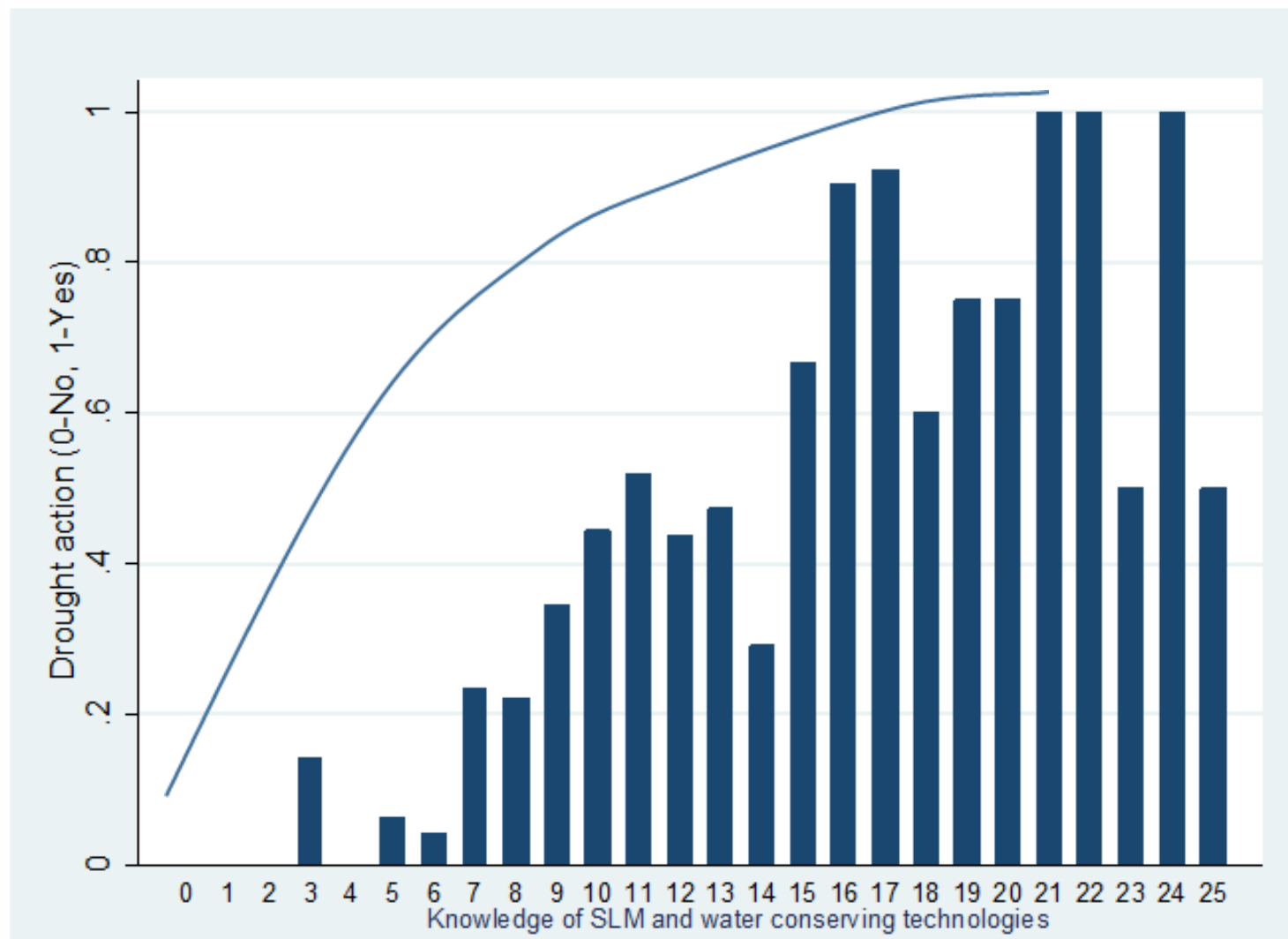
Farmer responses to droughts

Type of actions in response to droughts	Share, total	Share, lower asset	Share, middle asset	Share higher asset
No action	63%	79%	70%	40%
Planted different crop or crop variety	19%	14%	15%	31%
Changed planting dates	8%	3%	10%	15%
Applied water/land conserving practices	5%	1%	2%	4%
Others (e.g. shifted to livestock)	4%	2%	2%	7%
Reduced cropped land	2%	1%	1%	3%

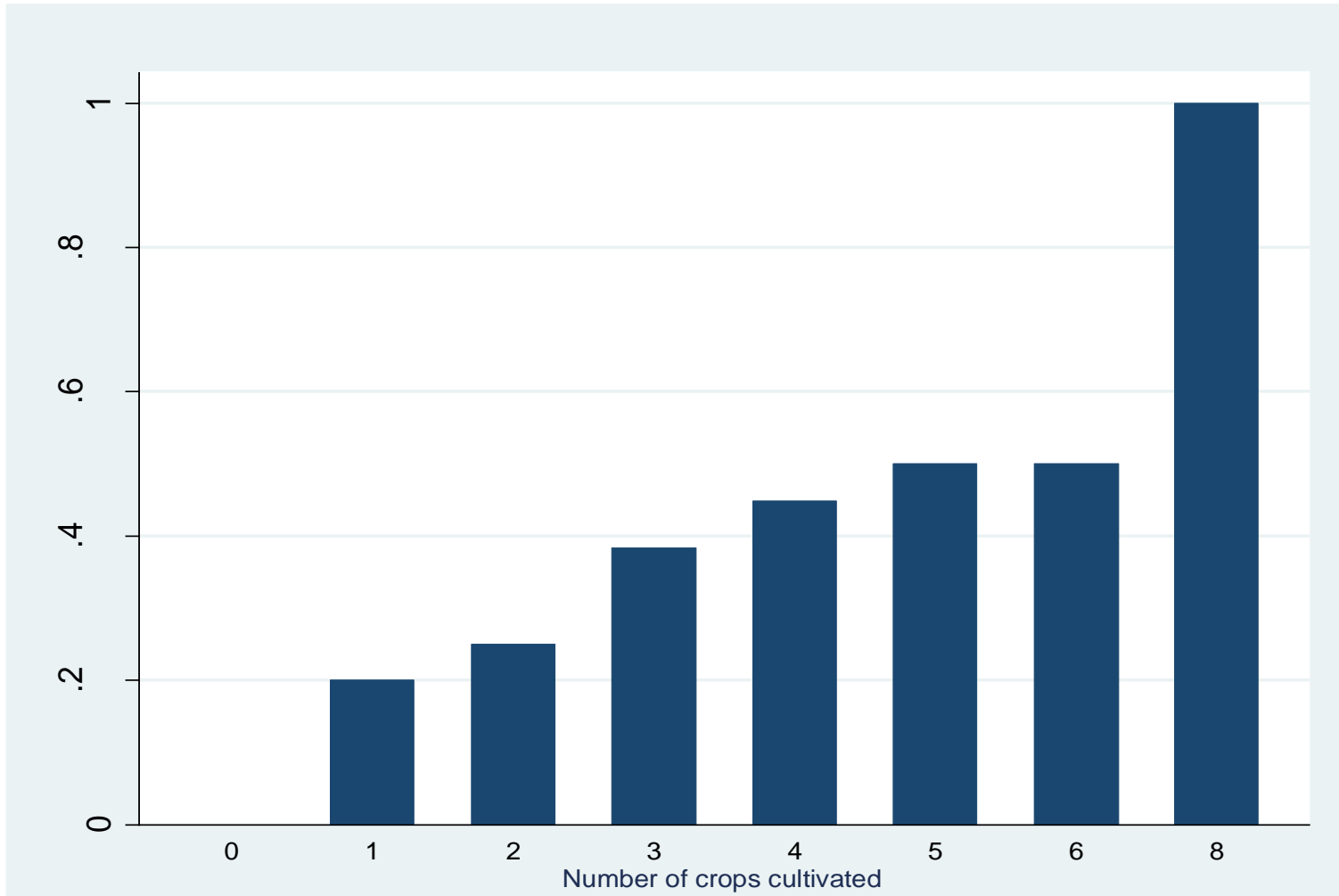
Barriers to coping with droughts



Drought action catalysts: knowledge of SLM and water conserving technologies



Drought action catalysts: diversified cropping portfolios



Stakeholders' analyses: issues and opportunities

- Lack of rapid and timely access to drought-related meteorological information.
- A lot of ongoing efforts on drought risk mitigation actions, but weak inter-agency linkages and coordination.
- Linkages between research institutes with farmers, seed companies, and rural advisory services appear to be quite weak.
- Strong agreement and consistency in major drought risk mitigation actions proposed.
- Many proposed drought risk mitigation actions are no-regret options.

Stakeholder suggestions of drought risk mitigation policy options

- Crop diversification
- Breeding of drought resistant crop varieties and their seed production, including for diversification crops
- Improving water use efficiency in agriculture (more crop per drop)
- Improved dialogue between: crop physiologists, agronomists, breeders and farmers
- Improving extension and rural advisory services

Stakeholder suggestions of drought risk mitigation policy options

- Expand drought insurance products, specifically index-based drought insurance approaches
- Improve monitoring and forecasting of droughts (data collection, hydro-economic modelling, open access to data)
- Strengthen the coordination of drought response and risk mitigation activities

Stakeholder suggestions of drought risk mitigation policy options

Practitioner	Time scale	Issue
Meteorologist Insurer Farmer	Years	Risk management
Farmer Agronomist Breeder	Weeks to months	Productivity
Plant physiologist	Days to weeks	Mild shock, survival

Major conclusion

- Need to develop a National Strategy for drought risk mitigation and preparedness:
 - improve knowledge on the impacts of droughts
 - systematize the available knowledge on drought risk mitigation strategies
 - clearly define inter-agency collaborations and actions for drought preparedness and drought risk mitigation