

## POLICY BRIEF: Drought as Disaster: Adaptation Measures Chart

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<b>Potential Mitigation / Adaptation Options for Agriculture, Science, and Governments which would yield important results 5 years from now</b>			
<b>Sector/Issue</b>	<b>Mitigation Goal</b>	<b>Who can help/What to do</b>	<b>Issues for Consideration</b>
<b>Agriculture</b>			
Global changes to Agriculture Industry	Encourage shift to a new agriculture regime. Climates and growing seasons shift, so too should farming practices. Invest in drought- and pest-resistant crop development, prevent yield loss, develop conservation-conscious irrigation technology; invest in organic and all-natural crop yield enhancing R&D	Academia, agroindustry, special interest groups, environmental groups, biotechnology and genetically-modified crops, industrial innovation and adaptation of irrigation equipment	Perceived risk to public health and safety, ecological risk of introducing genetic variants, conflicts and competition over water. Develop green technology adaptation options that reduce emissions, protect environment and food supply
Soil Science and Management	Increase organic content of soils as a low-cost and effective way to increase water holding capacity of soil so it acts as a reservoir, minimizes erosion due to flooding, and improves soil fertility.	Public and private investment, promote cooperative operations to lower farmer risk.	CO2 sequestering continues to be promoted by major NGOs such as the Rodale Institute
Risk Reduction and Disaster Assistance for Drought	Construct new risk reduction mechanisms and farmer safety nets to meet drought-generated needs, minimize family farm and small corporate failures, and keep farmers in business. Look to five-year safety nets for participants (insurance schemes, USDA Disaster Assistance programs).	Federal government/Insurance Industry: Improve drought mitigation options for agricultural producers by improving disaster assistance and drought relief programs. Ensure spread of financing options, including self-help and investments that are spread across many stakeholders.	Producer complaints. Mechanisms better suited to the problem should be devised, identifying cost controls and both public and private sector solutions that can be brought to bear on the problem. Examine insurance options such as catastrophic bonds.
<b>Science</b>			
Scientific Advances in Drought Monitoring and Forecasting	Our current ability to predict drought constrained to only 1-2 seasons ahead, which constrains preparedness planning. With the anthropogenic/climate cycle, there is great complexity to be understood if we are to improve these forecasting abilities. It is urgent that we develop plans and policies based on reliable scientific data.	The government, private sector, and philanthropy should invest in research for all forms of drought-related issues to promote improved risk reduction and relief measures.	Limited pool of discretionary funding available at federal, state, regional, local levels and in public, private, and philanthropic sectors.
Biodiversity	Systematize species network impacts at various drought stages.	Plan protective measures and have clear triggers in place.	Potential conflicts over protection efforts and water access and availability.

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<b>Governments (Federal, State, Regional, Local)</b>			
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Vulnerability & Resilience	Increase self-sufficiency at the household level and improve adaptive capacity	Vulnerability Assessment and Drought Risk Assessments that are multi-sectorial.	Historically entrenched, conservative narratives about climate change
Social consequences	Address cascading social consequences such as increasing impoverishment, rising crime levels, impact on vulnerable groups	Further research by scholars and community members on drought impacts on social well-being	Perspective of vulnerable groups; understanding of power
Public Health	Investigate and confront negative health impact of drought (e.g. lack of access to clean water, leading to increases in diarrheal illness, West Nile Virus, and other diseases impacted by water availability)	Further research by state and local government	Entrenched and high stakes historical inequities in social structure, such as disadvantaged unincorporated communities vs. affluent sectors
Economic Impacts	Minimize asset loss, promote job stability, prevent price instability and stabilize inflationary pressures (measures ensure continued economic activity).	Government drought relief efforts to prevent market volatility, overreactions	Food security, business and public sector impacts, livelihood resilience, economic development
Migration	Prevent mass migration due to exceptional droughts and mega-droughts—such as in 1930s during Dust Bowl	Monitor population growth, ensure sustainable urban planning, smart growth, and proper infrastructure to support	Economic and social impacts of internal or external mass migrations, national security issues, urban sprawl has strong support
Water Management/ Water Infrastructure	Maximize resource availability, efficiency through proactive mitigation strategies	Initiate actions before an emergency, e.g., desalination, water recycling and reuse, pricing strategies, water conservation, identification of back-up water supplies, expanding water infrastructure and its reliability, and creating new reservoirs	Desalination is a high energy adaptation (increases GHG emissions), expensive, and creates ecological risk of saline discharge and disincentive for conservation. Ensure everyone has access—water as a human right.
Lack of Public Understanding of Scientific Advances and Data Related to Drought	To help build broad based consensus, target education on chain of effects, especially highly complex issues such as the anthropogenic/climate cycle, and on ways to contribute to solving challenges. Urgently needed is increased public understanding of the value of scientific advances and data to predict and manage drought, at all levels.	Scientists and public agencies communicate science consistently and effectively to all stakeholders, and make it highly accessible through tools like infographics, public dashboards, posters, curriculum units, mini graphic novels, suggested K-12 field trips, and similar tools of high value to educating the general public.	Precious time, effort, and funds need to be allocated for delivering science knowledge in forms useable by a broad range of stakeholders, to increase understanding and adoption.

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<b>Governments (Federal, State, Regional, Local) continued</b>			
<b>Sector/Issue</b>	<b>Mitigation Goal</b>	<b>Who can help/What to do</b>	<b>Issues for Consideration</b>
Lack of broad-based consensus	Use case studies, lessons learned, best practices and success stories to construct narratives of achievability that can build confidence and move all stakeholders forward	Scientists and communicators make highly accessible via tools like single-portal Drought Toolbox	Develop strategies for moving away from status quo-models to, drought has psychological efforts that need to be countered
American entrepreneurship/innovation	Invest heavily in American ingenuity, develop new products and solutions, new green industries for the future	Target regional, state, and federal funds for research, partnerships, and pilot programs	Competition for and hard decisions about limited resources and funding