IDMP Integrated Drought Management Programme





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Drought prediction/monitoring at regional, national and local scales

2nd Online Data Workshop in Western and Central Asia *November 23, 2021*



1. Overview of Integrated Drought Management Programme

2. Drought Monitoring and Prediction

3. Joining Forces for IDM in Central Asia

4. What IDMP can contribute







The Integrated Drought Management Programme











The heart of IDMP: The Partners









The Three Pillars of Integrated Drought Management





Integrated Drought Management Programme



Overcoming bad habits: Crisis vs. Risk Management:

Crisis Management

- Expensive
 - Costs + costs of inaction
 - Repeats past mistakes
- Post-impact
 - Drought relief
- Treats the symptoms of vulnerability, i.e., impacts
- Rewards poor management of resources
- Increases vulnerability, reliance on government & donors

Risk Management

- Investment
 - Short-term—EWS, networks
 - Long-term—institutional capacity, structural adjustments
- Pre-impact
 - Mitigates and reduces risks
- Identifies and treats the root causes of vulnerability and hazard
- Promotes improved stewardship of natural resources
- Builds self-reliance, reduces vulnerability

Source: Don Wilhite, 2015 link

Link to further work on the Economic Argument by the IDMP and World Bank







IDMP's Integrated Drought Management Helpdesk



www.DroughtManagement.info







Pillar 1: Monitoring and Early Warning Systems



- Monitoring/early warning, prediction and information delivery systems
 - Integrated monitoring of key indicators
 - Precipitation, temperature, soil moisture, streamflow, snowpack, groundwater, <u>impacts</u>, etc.
 - Use of appropriate indices
 - Used to trigger actions in drought plans
 - Reliable seasonal forecasts
 - Development/delivery of information and sector-specific decision-support tools







Importance of a Drought Monitoring System

- allows for *early* drought detection
- improves response (*proactive*)
- "triggers" actions within a drought plan
- a critical *mitigation* action
- *foundation* of a drought plan

Source: Svoboda, 2009







Potential Monitoring System Products and Reports

- Historical analysis (climatology, impacts, magnitude, frequency)
- Operational assessment (cooperative data, SPI and other indices, automated networks, satellite and soil moisture data, media and official requests)
- Predictions/Projections (SPI and other indices, soil moisture, streamflow, seasonal forecasts, SST's)







Source: Svoboda, 2009

Components of a Drought Early Warning and Information System

• Monitoring **AND** Forecasting

• **Tools** for decision makers

• Drought risk assessment and planning

Education and awareness

Source: Wilhite, 2013







Importance of Drought Indices

- Simplify complex relationships and provide a good communication tool for diverse audiences
- Quantitative assessment of anomalous climatic conditions
 - Intensity
 - Duration
 - Spatial extent
- Historical reference (probability of recurrence)
 - Planning and design applications

Source: Svoboda, 2009







Handbook of Drought Indicators and Indices

- Handbook is a resource to cover most commonly used drought indicators/indices
- A starting point to describe and characterize the most common indicators and indices and their applications
- Does not recommend a "best" set of indicators and indices, given research requirements for appropriate application in location in question.











Monitoring, Early Warning & Information Delivery Systems

Indicators/Indices	Agencies/Ministries/Organizations
Precipitation	• Water
Temperature	 Meteorological & Hydrological Services
 Surface water supplies 	 Agriculture, Forestry & Fisheries
 Stream flow 	Environment
 Soil Moisture 	Health
 Reservoir levels 	• Energy
 Snow pack 	 Transportation
– Water use	Commerce
Ground water	
 Remotely-sensed data (e.g., plant water 	• Social Services
stress)	NGOs
• Impacts	Others
 By sector, area 	

Drought Monitoring and Early Warning Systems (DEWS)

Regional Drought Monitors

ICPAC – East Africa CIIFEN Drought Monitor Meso American Drought Monitor NorthEast Brazil Drought Monitor North American Drought Monitor Caribbean Drought Bulletin Pacific Island Climate Update European Drought Observatory Drought monitor for Central Europe Drought Watch (South Eastern Europe)

Three Pillars of Integrated Drought Management

- 1) Monitoring and early warning systems
- 2) Vulnerability and impact assessments
- 3) Drought preparedness, mitigation and response

All are need for successful drought plans/polices

Components of DEWS

- Monitoring AND Forecasting
- Tools or decision makers
- Drought risk assessment and planning
- Education and awareness











GLOBAL PRODUCING CENTRES SEASONAL CLIMATE OUTLOOK

PRECIPITATION

SON 2021: LRFMME low 40 – 50 % probability for **bellow normal** rainfall in **north-eastern** Madagascar (consistent with C3S and IRI). No clear signal for southern and western Madagascar (consistent with C3S).

OND 2021: LRFMME low 40 – 50 % probability for **bellow normal** rainfall in **north-eastern** Madagascar (consistent with C3S and IRI), and low 40 – 50 % probability for **above normal** rainfall in parts of **southern regions** (consistent with IRI).



Examples of Seasonal Drought Forecasts

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Seasonal Rainfall Forecasts linked to ...



Monitoring Products linked to



... Seasonal Drought Outlooks



Seasonal Drought Outlooks



Droughts in Central Asia: past, present, future



- "Large areas of east-central Asia experienced drying in the early 2000s as a result of warmer temperatures, lower humidity, and declining soil moisture."
- "Paleoclimate data from the Mongolian plateau suggest that this recent central Asian drought exceeds the 900year return interval, but is not unprecedented in the last 2060 years."
- "Aridity in East and West Central Asia is projected to increase, especially beyond the middle of the 21st century and global warming levels beyond 2°C (medium confidence)"
- "Glaciers are projected to experience volume losses of approximately 30 to 100% by 2100 [...] Under mid-range emissions scenarios glaciers in this region are projected to reach peak runoff during the period 2020 to 2040."









The regional, integrated Response:

"The Regional Strategy for Drought Risk Management and Mitigation in Central Asia for 2021-2030 proposes measures to enhance ecosystem and societal resilience to droughts and periods of water scarcity by moving **from a reactive to a proactive approaches and regional integration [...]**"

"[...]Three pillars of drought preparedness offered in the UNCCD Drought Tool Box: (i) monitoring and early warning, (ii) vulnerability and risk assessment, and (iii) risk mitigation measures."

- 1. Building capacity on three pillars
- 2. Drought Mitigation, Development of Plans to Address Water Scarcity and Data Dissemination
- 3. Capacity Building and Awareness Raising
- 4. Regional Integration.

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Joining Forces for IDM in Central Asia: Implementing the Regional Strategy



- "All hands on deck" needed
- Build on all existing initiatives
- Integrate into existing frameworks
- Collaborate to bring the parts of the puzzle together
- Integrate vertically and horizontally
- Inclusive approach, leave no one behind







What IDMP can bring to the table

- WMO structures of National Hydrological and Meteorological Services
- GWP regional Network of CACENA: partners from national, regional and local Government Institutions, Intergovernmental Organisations, international and national Non-governmental Organisations, Academic Institutions and Research Institutions, Companies, and service providers in the public sector
- Close collaboration with regional partners
- A strong network of partners with a
- Using the experience of supporting the establishment of drought mechanisms in other parts of the world
- Sustained support (not a one-time project approach)











Start small but start...

Starting with small steps on the ground in Uzbekistan (and Armenia):

- Building on and complimentary to existing approaches
- Taking Stock, Stakeholder Mapping
- Survey and bringing together main actors
- Joint planning of further steps, project development?







Get in touch: Integrated Drought Management Helpdesk



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