REPUBLIC OF SLOVENIA
MINISTRY OF THE ENVIRONMENT AND SPATIAL PLANNING
SLOVENIAN ENVIRONMENT AGENCY
si2021.eu

Tackling drought in South-east Europe

Andreja Sušnik

Danube Drought Workshop - online, 20 September 2021

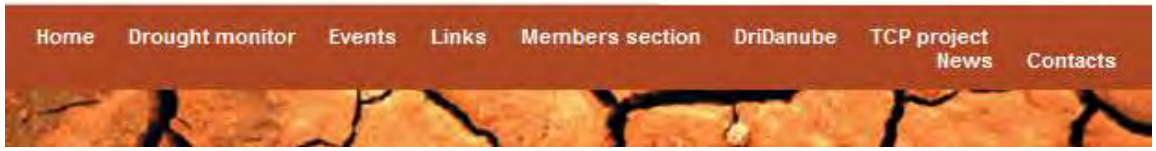
Global Water Partnership Central and Eastern Europe

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

IAWD DANUBE WATER PROGRAM
Smart policies, strong utilities, sustainable services

DMCSEE
Drought Management Centre for Southeastern Europe

United Nations Convention to Combat Desertification



13 countries

www.dmcsee.org

- Established in 2006 (WMO, UNCCD)
- hosted by Slovenian Environment Agency

Mission:

- development & application of **drought risk-management tools and policies** in SEE
- **improve drought preparedness to reduce drought impacts**

Joint activities & **cooperation** with **WMO**, **IDMP**

Help in **implementation of UNCCD mission**

monthly & seasonal **bulletins**

bring in **new knowledge** & **skills**; support & organisation of **trainings of national experts**

Drought policy recommendations (national level, regional bodies)

DMCSEE
Drought Management Centre for Southeastern Europe

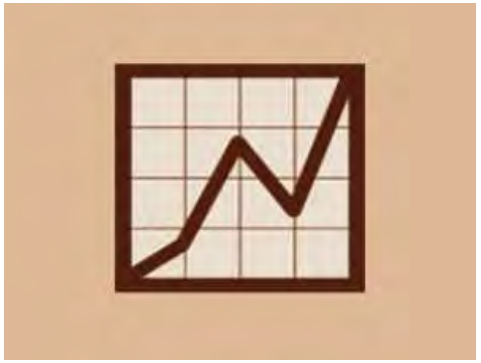
Drought researchers

United Nations Convention to Combat Desertification

UNCCD national focal points

WMO permanent representative (Nat. Hydro-Meteo Services)

Pillar I: Drought Monitoring & Early Warning



Source: IDMP

- All countries have **drought monitoring in place at the national level**
- **Agitation to integrate all data required** for wholesome drought management (monitoring, impacts, response) in one place – help to stakeholders, decision-makers

- **Regionally diverse** drought monitoring – regarding type of drought monitored, variety of indices used
- **No consensus on thresholds** for (agricultural, hydrological) drought nor used systemic approach for early warning to public
- EWS mostly carried out **after drought on-set** - when first signs of drought impacts have already occurred (esp. if drought monitoring is based on monthly-scale indices)

> Regional tool: Drought Watch

Interreg
Danube Transnational Programme
DriDanube

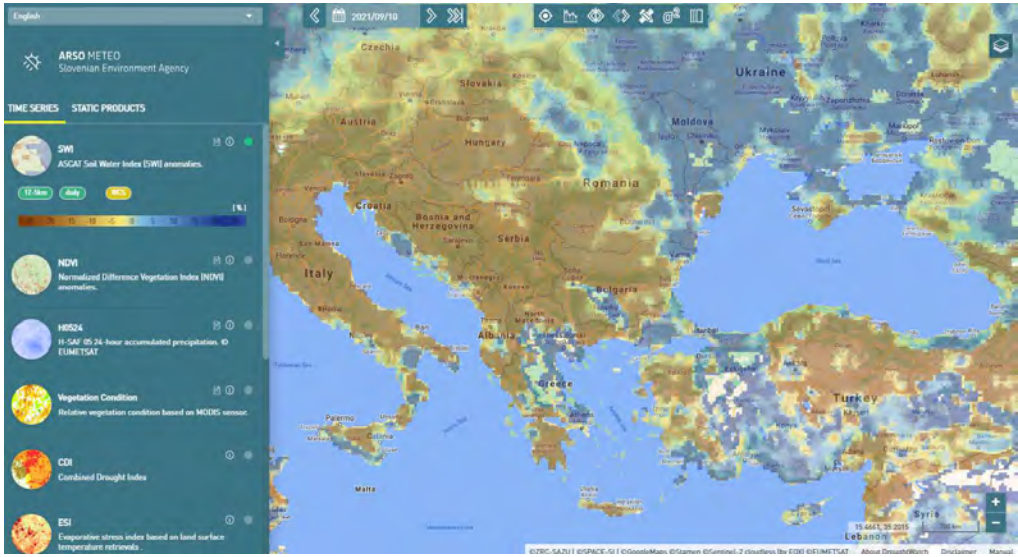
Project objective:

*To enable **cross-border comparable drought monitoring,***

risk & impact assessment, and to improve drought response.

www.droughtwatch.eu

Soil Water Index, 10 September 2021



- Open, interactive online tool
- Monitoring drought **beyond country borders**
- Advanced, **near-real-time** drought indices (beyond T, RR)
  - **a)** **Remote-sensed**, **modelled** (meteorology, soil moisture, vegetation health)
  - b) On-field **impacts** observations (agriculture, forestry)
  - c) Static drought **risk** maps (climatological predispositions, impacts stats)
  - **d)** **National** datasets --- *optional*
- Various tool **functionalities to examine** present & past droughts

www.interreg-danube.eu/dridanube

> Current project:
Alpine Drought Observatory

Interreg Alpine Space
Alpine Drought Observatory
European Regional Development Fund

www.alpine-space.eu/ado

- Alps snow cover = water source for regions downstream
- ↑ drought occurrence in the Alps → ADO for improving drought preparedness capacity in mountainous areas

- Drought **products tailored for the Alpine area** > **ADO platform**
- **Collection of impacts** for different sectors – EDII Alps
- **Better-coordinated-governance guidelines for more efficient water use and preventive measures** (i.e. solve conflicts of interest, protect sensitive ecosystems)

Pillar II: Drought Vulnerability & Impact Assessment

Source: IDMP

- Established **legal framework on post-drought evaluation of damage costs** (national compensation scheme)
- Direct **contact with DMCSEE** national focal points on regional impacts reports, regular online media search

- **Missing data for wholesome** (hazard, vulnerability, exposure) & **countries-comparable drought risk assessment**
- **Missing regular** collection of info on **sectoral drought impacts** (instead of post-drought assessment), which would be managed by national authorities – complementation to drought monitoring

> Informative **drought risk maps**

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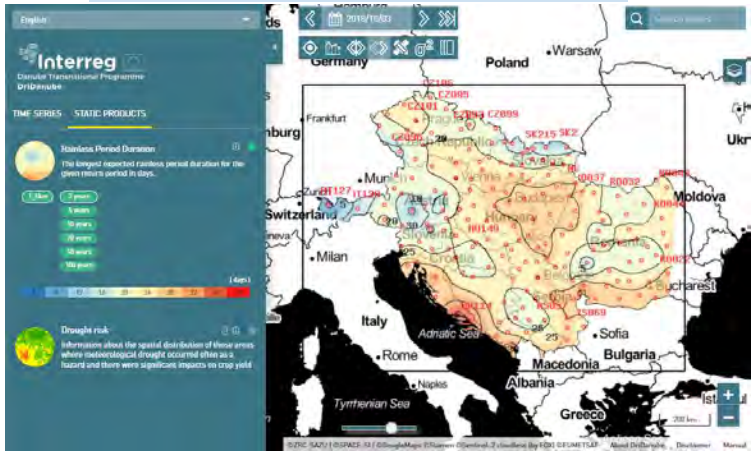
Danube Transnational Programme
DriDanube

www.droughtwatch.eu

Rainless period duration

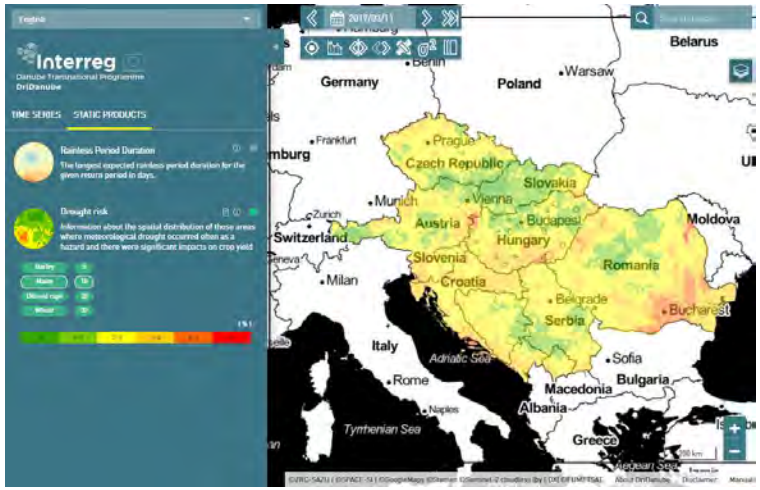
- modelled product - data source: CarpatClim, DanubeClim, national ground stations
- risk **in climatological sense**:
  - *length of the longest expected rainless period during vegetation season for the given return period*
- available for 5 different return periods (2, 5, 10, 20, 100 years)



Rainless period duration for a 2-year return period

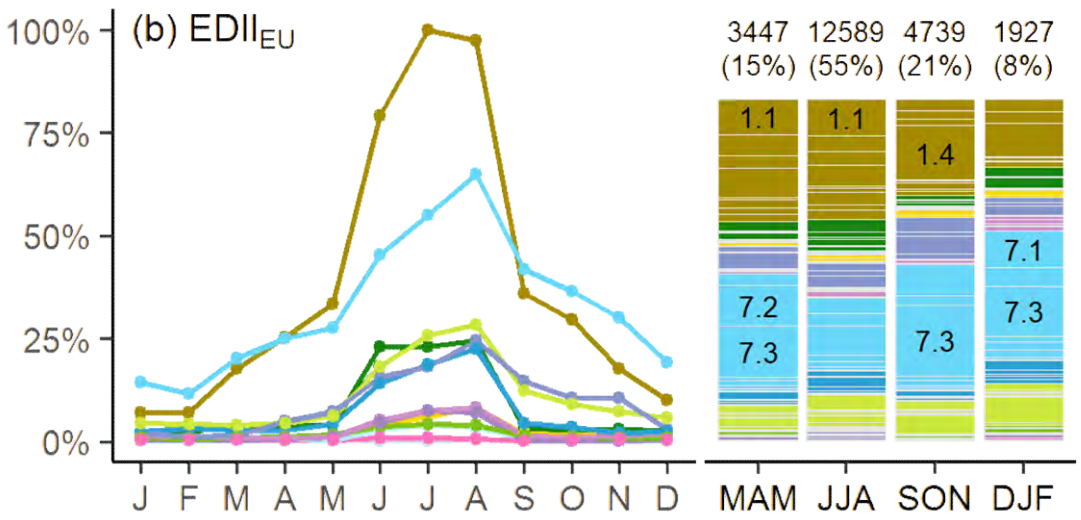
Drought risk on main agricultural crops

- modelled product – data source: national stats
- risk in terms of **expected crop yield loss**:
  - *spatial distribution of the areas where meteorological drought occurred often as a hazard & there were significant impacts on crop yield*
- available for maize, wheat, barley and rape seed for 4 different probability levels (5-, 10-, 20-, 30-year return period)



Drought risk on maize in drought event with a 10-year return period

> **Drought impacts** in the Alpine region - EDII$_{ALPS}$



- Agriculture and livestock farming
- Forestry
- Freshwater aquaculture and fisheries
- Energy and industry
- Waterborne transportation
- Tourism and recreation
- Public water supply
- Water quality
- Freshwater ecosystems
- Terrestrial ecosystems
- Air quality
- Human health and public safety
- Conflicts

Most evident in summer, in

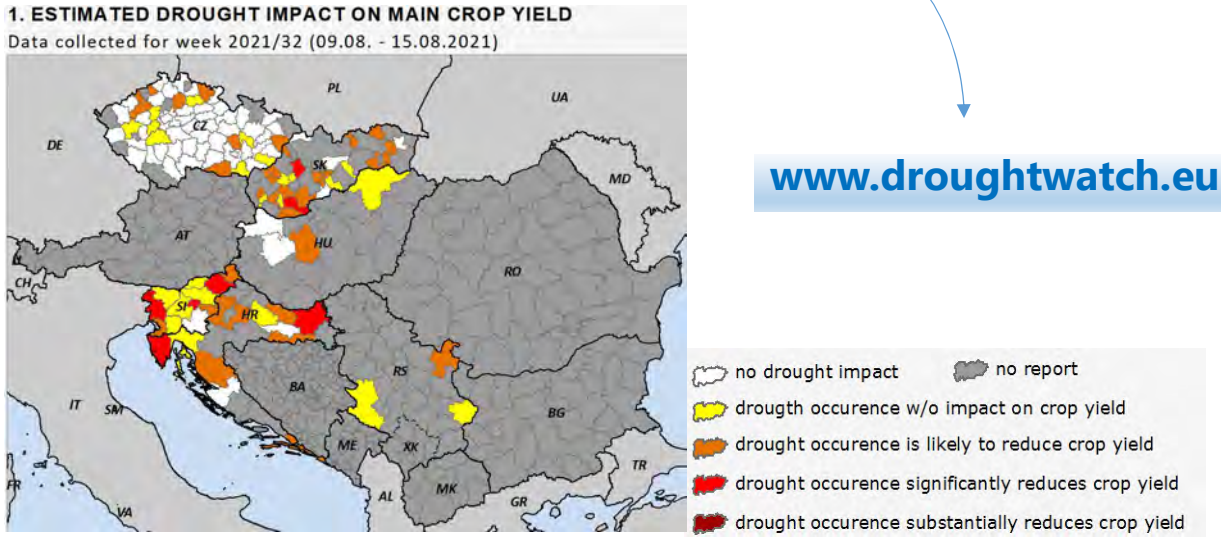
- Agriculture and livestock farming
- Public water supply
- Forestry and Freshwater ecosystems

Credit: Ruth Stephan et al., 2021. An Alpine Drought Impact Inventory to explore past droughts in a mountain region; Source of data: The European Drought Impact report Inventory – EDII

> National Reporting Networks
– community involvement

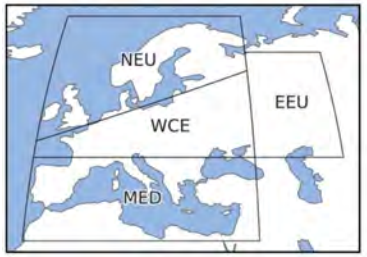
- **On-field observations** by interested farmers, agricultural experts and other individuals (~ 1000 in Danube Basin Region)
  - how drought influences presumed crop yield or forest growth at a specific location
- Observations sent **online** (common questionnaire) are **aggregated into 5 severity categories**
- **Weekly routine** to check visual vegetation status/impacts
- **Validates and complements drought indices**

Is a reason for poor vegetation health really drought?



www.droughtwatch.eu

> Climate change projections – increasing risk in EU



ipcc
INTERGOVERNMENTAL PANEL ON climate change

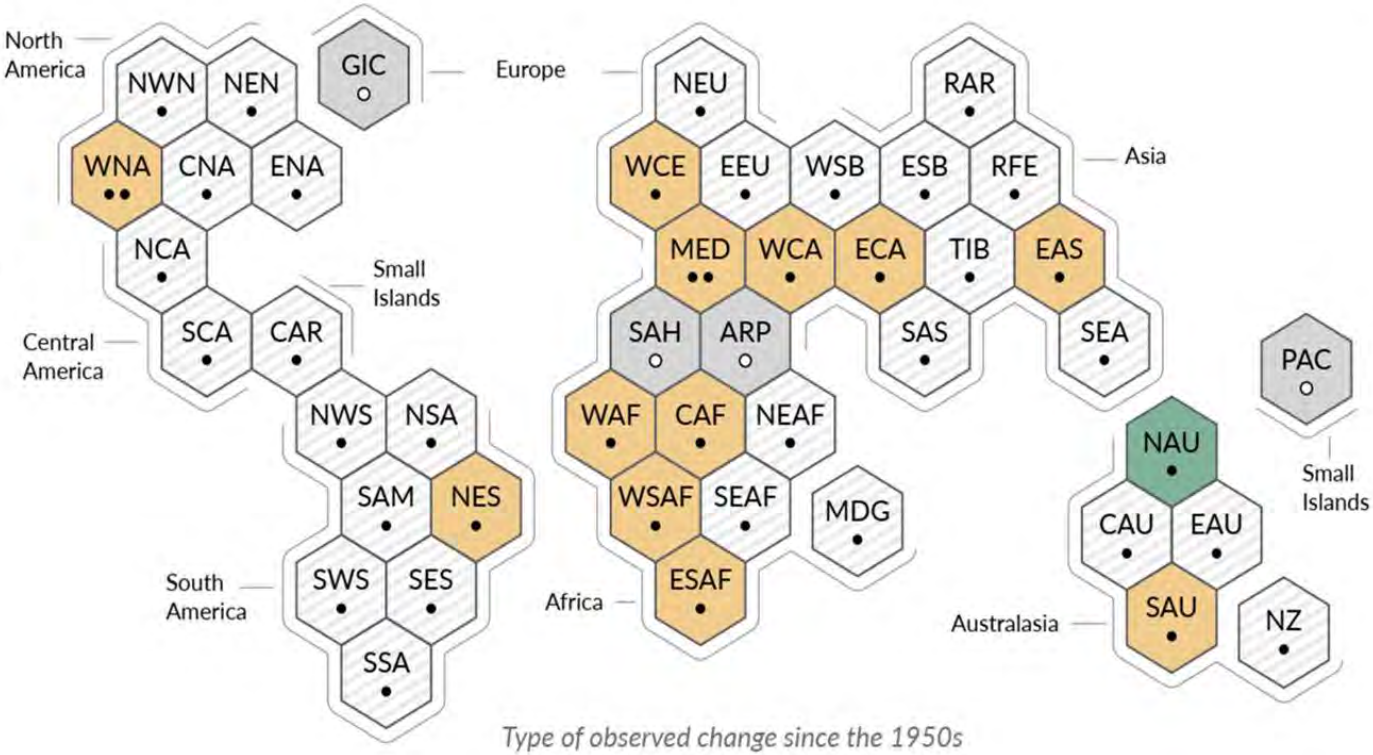
Climate Change 2021
The Physical Science Basis

Type of observed change
in agricultural and ecological drought

- Increase (12)
- Decrease (1)
- Low agreement in the type of change (28)
- Limited data and/or literature (4)

Confidence in human contribution
to the observed change

- ●●● High
- ●● Medium
- ● Low due to limited agreement
- ○ Low due to limited evidence



Type of observed change since the 1950s

Pillar III: Drought Mitigation, Preparedness & Response

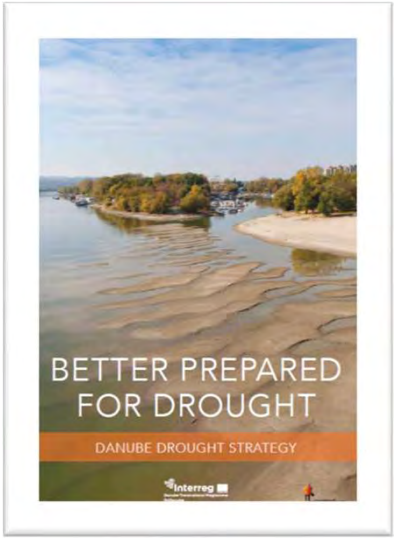
Source: IDMP

- **Well-perceived** that **drought** can reach a level of **natural disaster** & presents a certain threat to national security

- **Missing formal umbrella document** on drought management
- Existing **crisis-oriented drought policies** support the adoption of reactive drought response
- **Lack of cooperation** between relevant national institutions & across vulnerable sectors
- **No clear inter-institutional scheme** of data, responsibility and communication flow → weak response before, during drought (mainly crisis management)

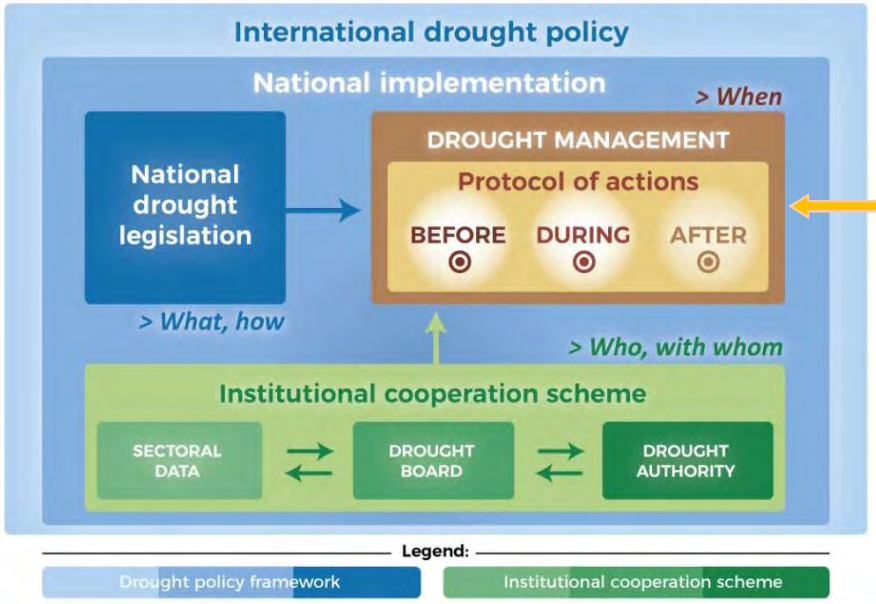
> Danube Drought Strategy – connect monitoring & response

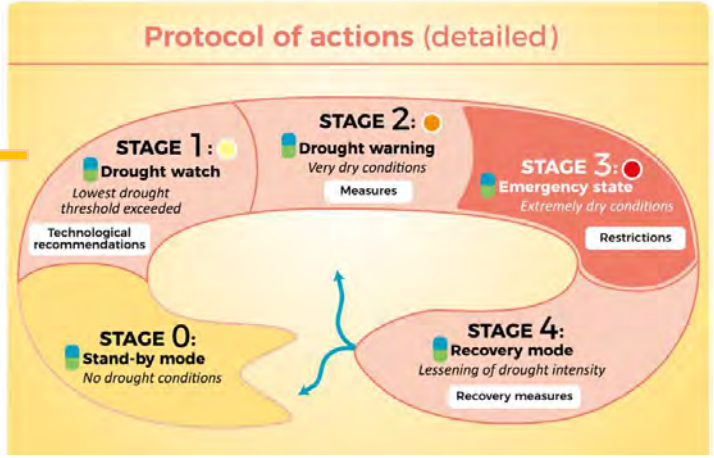
Available at *Interreg DTP → DriDanube project → Library tab* www.interreg-danube.eu/dridanube



- Proposed framework for improved drought management
- Core: **Optimal Drought Management Model** for proactive institutional approach
- Connects drought monitoring with measures/actions (also during no-drought conditions)
- Can be a practical national document (***who, what, when***)
- Applicable to any country

Optimal drought management model (simplified)





Good practice of drought management integrated into national legislation in Danube Basin country:
Slovak National Action Plan to Combat Drought

Interreg
Danube Transnational Programme
DriDanube

Remaining challenges, needs

DMCSEE
Drought Management Centre for Southeastern Europe

	Regional level	National level
Monitoring 	• **Further improvement** of drought monitoring (mountainous areas, Drought Watch) • **Expert partnerships** w. EDO, other global/regional platforms	• National drought-related **data integration** into regional drought tools • Integration of **national EWS into Global Drought Classification System**
Vulnerability & Impact Assessment 	• Apply risk assessment into existing tools • **Regular impact database(s)**, continuing and connections of NRNs • Explore **link between drought indices and impacts**	• i.e. EU Civil Protection Mechanism also in non-EU countries • Regular **collection of impacts**, sustainability of **NRNs** • Wholesome drought risk assessment (also **societal, landscape contributors** to drought risk)
Society resilience Mitigation, Preparedness & Response 	• Uplift knowledge & tools use; **institutional & sectoral partnership** • **Link** drought **monitoring with** preventive/adaptation **measures** • Explicit **drought policy formation/implementation** • **Financial & human resource** challenges, countries commitments	• **Active engagement** in collaboration and partnerships (DMCSEE, WMO, UNCCD) • Proactivity – **Drought Strategy into practice** (encourage national communication, national action plans)
Knowledge sharing, building network	• Drought awareness campaigns • New projects, guiding documents, regional networking	regional-national communication

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