Combating water drought requires a multi-faceted approach involving both immediate and long-term strategies and these strategies are well documented by many agencies covering different aspects:

EPA for Early Warning Systems , and Monitoring:

UNCCD for Restoration of Ecosystems:

EPA:

1. Meter/Measure/Manage

Metering and measuring facility water use help to analyze saving opportunities. This also assures the equipment is run correctly and maintained properly to help prevent water waste from leaks or malfunctioning mechanical equipment

2. Optimize Cooling Towers

Cooling towers provide air conditioning for laboratories and are large consumers of water. Cooling tower operations can be optimized by carefully controlling the ratio of water discharged (blowdown) to water evaporated. The ratio of evaporation to blowdown is called the cycle of concentration. For maximum water efficiency, cooling towers should be operated at six or more cycles of concentration. Metering water put into and discharged from the cooling tower ensures the cooling tower is operating properly and can help identify leaks or other malfunctions.

3. Replace Restroom Fixtures

"Replace restroom fixtures" typically refers to the process of removing old or outdated components in a restroom and installing new ones. This can involve a variety of fixtures, including:

1. **Toilets**: Replacing old toilets with newer models that might be more efficient, environmentally friendly, or have advanced features.
2. **Sinks**: Updating sinks to newer designs, which could also include replacing the faucets.
3. **Urinals**: In men's restrooms, replacing urinals can help improve hygiene and water efficiency.
4. **Faucets**: Installing new faucets that may offer touchless operation or better water conservation.
5. **Hand Dryers**: Upgrading to more efficient or touchless hand dryers.
6. **Soap Dispensers**: Replacing manual soap dispensers with automatic, touchless models to improve hygiene.
7. **Paper Towel Dispensers**: Installing more modern and efficient paper towel dispensers.

The benefits of replacing restroom fixtures can include improved water efficiency, better hygiene, updated aesthetics, and sometimes even energy savings. This process is often part of larger renovation projects aimed at modernizing facilities, complying with current regulations, or improving user experience. The U.S. Department of Energy established federal water-efficiency standards in the 1990s. Prior to that, most EPA facilities had inefficient sanitary fixtures. For example, toilets used 3.5 gallons per flush (gpf). Nearly all EPA laboratories have since installed water-efficient fixtures, many of which have earned EPA's WaterSense® label for efficiency and performance. These include:

- New toilets with flow rates of 1.28 or 1.6 gpf.
- WaterSense labeled urinals flushing at 0.5 gpf or less.
- WaterSense labeled showerheads flowing at 2.0 gallons per minute (gpm) or less.

4. Eliminate Single-Pass Cooling

Single-pass cooling circulates a continuous flow of water just once through the system for cooling purposes before it goes down the drain. EPA strives to eliminate single-pass cooling in its laboratories. Instead, facilities have air-cooled or recirculating chilled water systems because of how inefficient it is

Use Water-Smart Landscaping and Irrigation

Planting native and drought-tolerant plant species minimizes the need for supplemental irrigation. Landscape water use can also be reduced 10 to 20 percent by having an irrigation water audit. EPA selects audit professionals certified through a WaterSense labeled program. WaterSense labeled weather-based irrigation controllers or soil moisture sensors are used to water only when plants need it.

6. Control Steam Sterilizer Water

Steam sterilizers use cooling water to temper steam condensate discharge from the sterilizer to the laboratory drain. Many older sterilizers discharge a continuous flow of tempering water to the drain, even when it is not needed. EPA has retrofitted sterilizers with a tempering water control kit or replaced old steam sterilizers with models that only apply tempering water when needed.

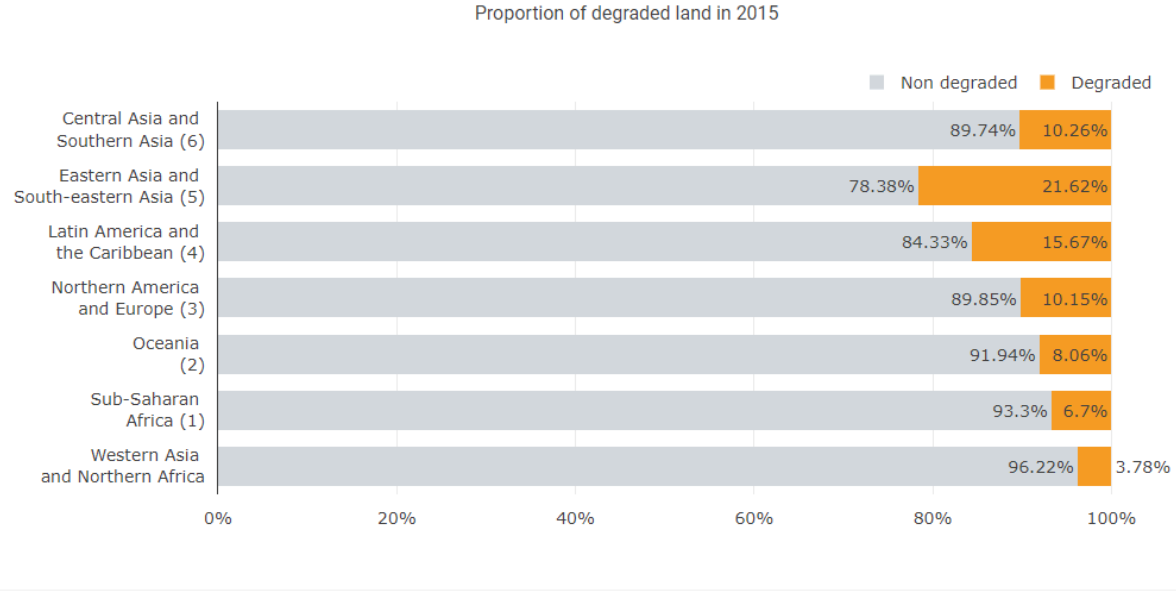
UMCCD:

Monitoring and early warning

Drought monitoring and early warning systems typically aim to track, assess and deliver relevant information concerning climatic, hydrologic and water supply conditions and trends.

The Drought Resilience, Adaptation and Management Policy (DRAMP) Framework and its guidelines and background documents, as well as the Handbook of Drought Indicators and Indices and database provide an overview of possible indicators and indices for drought monitoring specially the droughts that affects lands severely.

Land degradation :

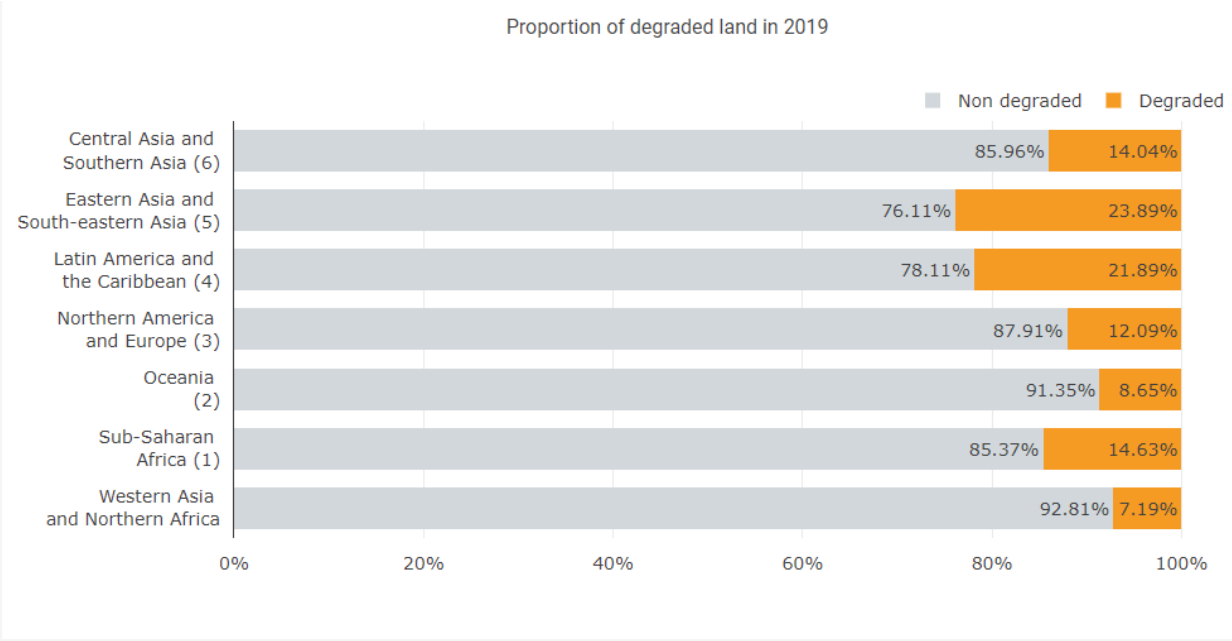


Notes

1 - Excluding Angola and Comoros;
2 - Including Australia, Papua New Guinea and New Zealand but excluding the islands of Oceania;
3 - Excluding United States of America, Belarus, Denmark, Luxembourg, Malta, Monaco, Norway, Russian Federation and Switzerland;
4 - Excluding Barbados and Grenada;
5 - Excluding Japan, Republic of Korea, Brunei Darussalam and Singapore;
6 - Excluding the Maldives;

Progress in the 2016-2019 period

Among the regions, Latin America and the Caribbean and Asia show a higher proportion of degraded land in 2019 than that observed globally, with 31.8 percent (or 220 million hectares) and 24.1 per cent (or 580 million hectares) respectively. However, trends since 2015 show that Africa is degrading considerably faster than the global average, with 6 per cent increase in the extent of degraded land and a total of 250 million hectares additional degraded land in 2019.



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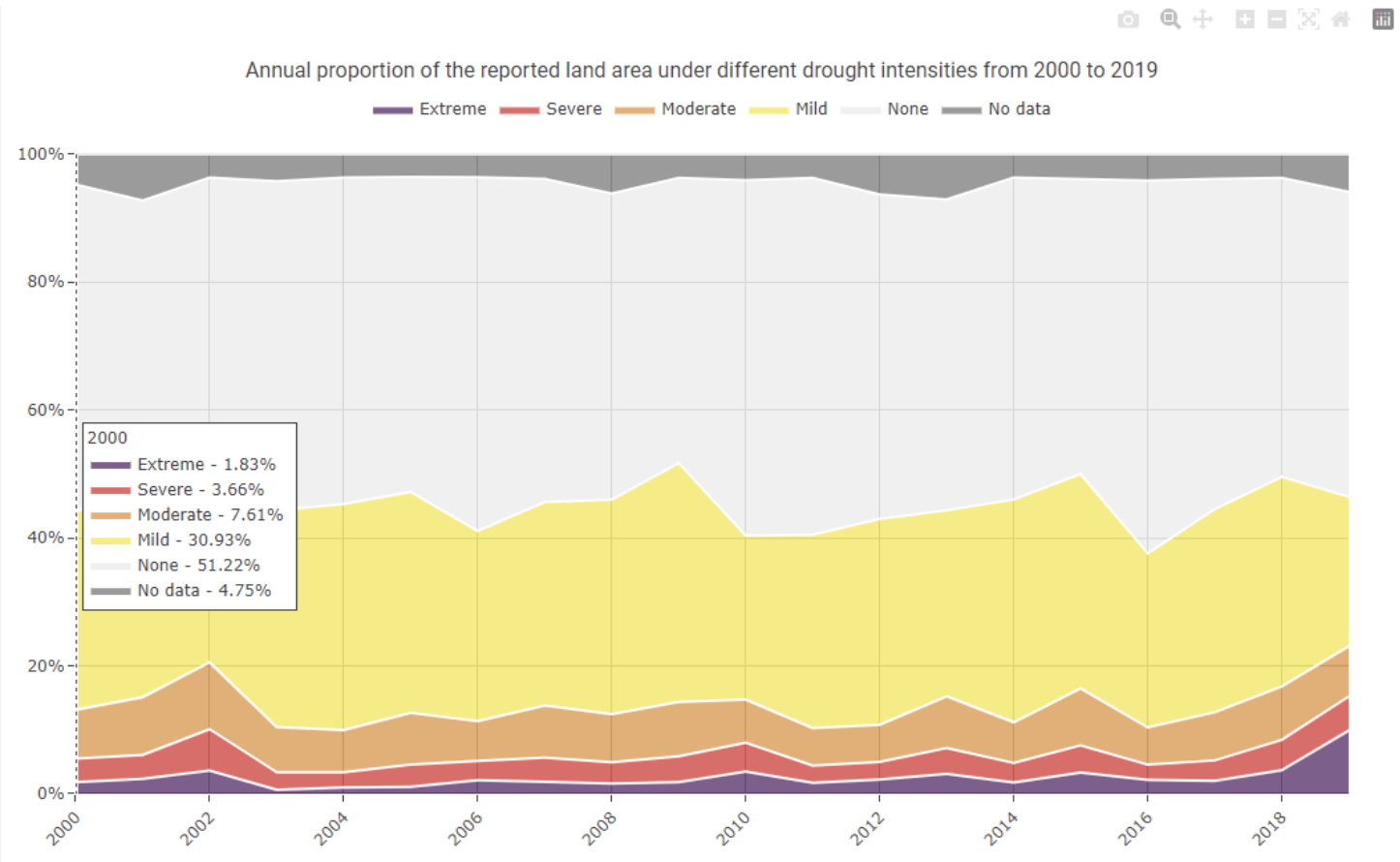
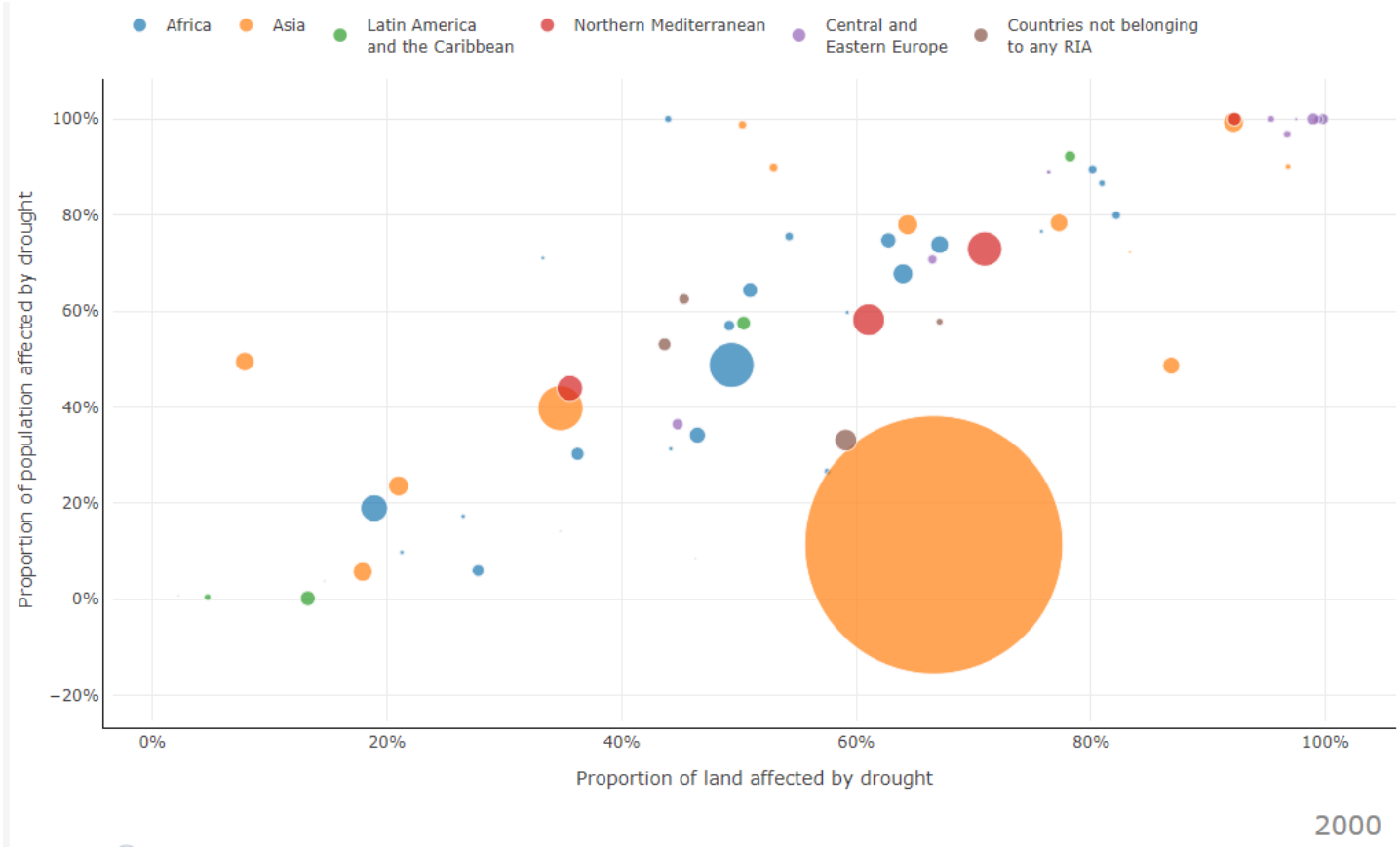
drought hazard:

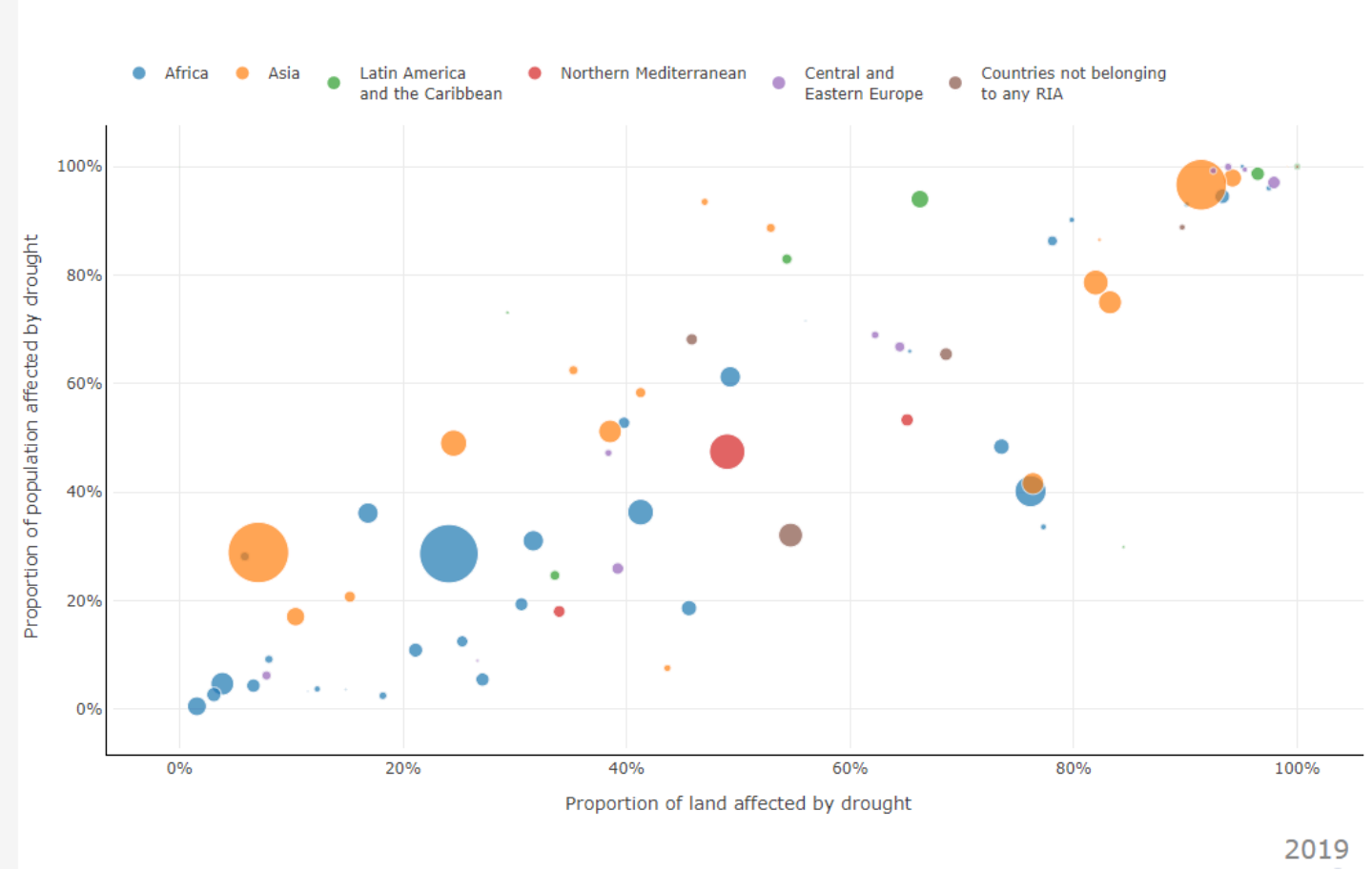


Regional trends in the area under drought and the proportion of population exposed:

in the year 2000.



in the year 2019



Find raw data, monitoring or early warning systems

The UNCCD Drought Toolbox provides you with a catalog of databases and developed systems to monitor drought in your region. We will ask you a few simple questions that will help you find the right database or developed systems for your assessment.

Vulnerability and risk assessment

In order to calculate the drought risk accurately, you need to take into account various geographic, climatic, social and economic factors. The Drought Resilience, Adaptation and Management Policy (DRAMP) Framework, and its guidelines and background documents provide an overview of possible approaches to assess risk and vulnerability:

Drought risk = Vulnerability x Hazard x Exposure

The UNCCD Drought Toolbox provides you with a catalog of vulnerability and risk assessment tools. We will ask you a few simple questions that will help you find the

right tools for your assessment.

The methodology and the solutions displayed in this tool were compiled and based on expert knowledge.

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