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Evidence on the approaches for the assessment and monitoring of the resilience of vulnerable populations and ecosystems to drought

Policy-oriented recommendations resulting from evidence on the approaches for the assessment and monitoring of the resilience of vulnerable populations and ecosystems to drought, under objective 2 of the Science-Policy Interface work programme for the biennium 2020–2021

Report by the Executive Secretary

Summary

By its decision 18/COP.14, the Conference of the Parties (COP) requested the Science-Policy Interface (SPI), as objective 2 of its work programme for the biennium 2020–2021, to provide science-based evidence on the approaches for the assessment and monitoring of the resilience of vulnerable populations and ecosystems to drought, also considering the effect of climate change on drought risk.

Following an extensive scientific review and assessment of existing synthesis reports and the primary literature, the SPI produced a technical report on drought-resilient assessment approaches and available indicators with the purpose of providing science-based guidance on enhancing the national assessment and monitoring of the resilience of vulnerable populations and ecosystems to drought, including understanding the influence of climate change on drought risk.

This document presents the activities undertaken by the SPI on objective 2 as well as a summary of the key findings emerging from the technical report. The Committee on Science and Technology may wish to consider these findings for the development, as appropriate, of recommendations to the COP.

Contents

I. Background

1. By its decision 18/COP.14, the Conference of the Parties (COP) adopted the Science-Policy Interface (SPI) work programme for the biennium 2020–2021 (annex to decision 18/COP.14). Under objective 2 of this work programme, the SPI is requested to provide science-based evidence on the approaches for the assessment and monitoring of the resilience of vulnerable populations and ecosystems to drought, also considering the effect of climate change on drought risk, based on a review of existing synthesis reports and the primary literature.

2. In response to this request and following its mandate as defined in decision 23/COP.11 and 19/COP.12, the SPI produced a technical report based on scientific evidence that provides science-based guidance on approaches for the assessment and monitoring of the resilience of vulnerable populations and ecosystems to drought, including understanding the influence of climate change on drought risk.

3. Key input for the technical report was based on the initial input from a commissioned institution[1] specializing in the subject matter, which collaborated with SPI members and observers serving in a dedicated working group. The commissioned institution worked with the SPI to develop a preliminary draft of the technical report.

4. The technical report was prepared in accordance with the rules and procedures established by the COP, by which any scientific output prepared under the supervision of the SPI should undergo an international, independent review process as well as the internal SPI procedures.[2]

5. The final draft of the technical report, titled Multiscale Approaches for Assessment and Monitoring the Resilience of Vulnerable Populations and Ecosystems to Drought, and an associated science-policy brief are in press at the time of this publication and will be made available to the public online in May 2022. The main scientific findings and consensus emerging from this technical report are summarized in this document.

II. Evidence base and rationale

A. Resilience and the impacts of drought

6. The SPI reported in its assessment that established scientific evidence[3] highlights droughts as the costliest of natural hazards, while being heavily influenced by humans. Through both anthropogenic climate change and direct human activities, humans are reshaping the frequency, intensity and patterns of droughts on global and local scales.

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[1] Under the leadership of the Bureau of the Committee of Science and Technology (CST), the United Nations Convention to Combat Desertification (UNCCD) secretariat and the SPI drafted a concept note, terms of reference and proposal evaluation criteria for scientific work towards achieving objective 2. Following an open call and in line with the United Nations rules and procedures, UNIQUE forestry and land use GmbH was commissioned for the task of developing a report under the guidance of the SPI.

[2] Drafts of the technical report were initially reviewed and refined by an SPI-dedicated working group. The next draft of the technical report was peer-reviewed by all SPI members, including all members of the Bureau of the CST and representatives from SPI observer organizations (195 review comments received). After addressing these comments, the next draft of the technical report underwent an independent scientific review, which included domain experts selected by the Co-Chairs of the SPI from each region (171 review comments received). These comments were considered in shaping the final draft of the report, which was then reviewed by the Bureau of the COP. The co-lead authors of the technical report ensured that all peer review comments received appropriate consideration.

[3] <https://www.ipcc.ch/srccl/>.

7. Drought is well recognized as a highly complex natural hazard, with multiple direct and indirect, short-term and long-term impacts across various spatial and temporal dimensions. Urban areas are also affected by droughts.

8. The direct impacts of drought in terms of human mortality and economic losses are better researched than the indirect impacts. However, indirect and off-site effects of droughts are usually not quantified. The availability of datasets on direct and indirect impacts of droughts is inadequate in many low-income countries particularly affected by drought. This relates, for example, to the indirect effects of droughts on food security, poverty, human health and migration.

9. Human-induced climate change and other human activities, such as land cover changes, are already affecting many weather extremes in every region across the globe. As a result, a large terrestrial water storage loss occurred between 2000–2020.The effects of drought become particularly severe where terrestrial reserves of water are depleted and not replenished following previous droughts. Many parts of Asia, the Middle East and North Africa, as well as North America presently have high levels of water stress.

10. Impacts of drought are modulated by the resilience of ecosystems and society. Drought resilience refers to the capacity of coupled socio-ecological systems to anticipate, absorb, accommodate, adapt, or recover from the effects of drought in a timely and efficient manner. Enhancing drought resilience involves responses over time that maintain or reorganize the essential functions, identity and structure of socio-ecological systems while also maintaining the capacity for long-term adaptation, learning and transformation.

11. Resilience to drought depends on maintaining and developing natural, economic, social, human and physical capital with the help of enabling policies and institutions supported by the sustainable and inclusive governance of natural resources. Human decisions on land, water use and land management play an important role in both ecological and social resilience to drought.

12. The monitoring and assessment of the resilience of ecosystems and vulnerable populations to drought is critical for understanding the capacity of ecosystems and societies to cope with, adapt to and recover from drought. Decisions can be made accordingly to adjust human activities in managing land and water ahead of anticipated droughts and to respond appropriately to the onset of droughts. In this regard, the monitoring and assessment of resilience contributes to moving from ‘reactive’ to ‘proactive’ drought response regimes and providing decision makers with the means to both track and project the status of a system (social, economic or ecological) in high- and low-resilience scenarios in response to drought.

B. Measuring drought resilience: options and limitations

13. Measuring drought resilience is possible, but highly context specific. Presently, there is no single definitive universal metric that can be recommended for measuring resilience to drought. The SPI scientific assessment considered the substantial body of literature on resilience, droughts and indicators per se, as well as a partially overlapping strand of literature on indicators of resilience to climate change. The resulting SPI technical report identifies a range of relevant indicators and associated methodological guidelines which have been established, tested and made available to stakeholders at global, national and subnational levels.

14. There are also indirect approaches to measuring resilience, and the technical report thus also covers the indicators available to capture the effects of drought on vulnerable populations and ecosystems to provide evidence of resilience. Tracking impacts and success in mitigating the effects of droughts on vulnerable people and ecosystems will reflect the ability and capacity to cope with, adapt to and recover from drought.

15. The SPI technical report organizes the different options for measuring drought resilience and drought effects as follows:

(a) **Indicators to measure the resilience of ecosystems and society to drought associated with natural, economic, social, human, and physical capitals along with corresponding methodological approaches for drought resilience assessments at all levels.** Countries can adapt the drought resilience indicators and methodologies summarized in table 1 to their needs. While conducting drought resilience assessments, it is not required that all of these indicators are used all of the time and in all settings. There are significant differences in local conditions and priorities; hence, those indicators best suited for each given case can be selected. However, it is essential that assessments include indicators of both social and ecological resilience for a comprehensive picture. Though the specific metrics may change depending on the level, these indicators are applicable at local, national and global levels. The SPI technical report provides detailed summary tables of the indicators that can be used to measure all five forms of capital, which can guide the selection of the most appropriate mix of indicators according to national circumstances;

Table 1
Overview of scientific evidence-based ecological and social resilience indicators using the concept of capital

Capital	*Indicator*
Ecological resilience	
Natural capital	Freshwater withdrawal as a proportion of available freshwater resources
	Change in terrestrial water storage over time
	Ecosystem water-use efficiency: natural (forest, grassland, wetland), managed (agricultural) and semi-managed ecosystems (rangeland), rural and urban ecosystems
	Ecosystem recovery time: change in vegetation health or stress, and corresponding recovery time after a drought disturbance
	Soil moisture levels for the season and soil characteristics influencing soil moisture holding capacity: soil organic carbon, soil texture, salinization, among other things
	Biodiversity and species richness: change in number of species, crop diversification
Social resilience	
Economic capital	Economic damage and loss (direct and indirect economic impacts); extent of exposure of household budgets and economic sectors due to dependence on availability of water during drought; share of population below poverty line; share of population covered by social protection (e.g, safety nets; disaster insurance)
Social capital	Land and resource tenure, self-organization, stakeholder inclusion, etc. Example: proportion of population living in households with access to basic services
Human capital	Exposure of populations to drought, knowledge systems and availability, income diversification, etc.
Physical capital	Freshwater withdrawal as a proportion of available freshwater resources, facilities, infrastructure (incl. for water), water-use efficiency of all sectors, technology access, etc.

(b) **A shorter list of common indicators and methodological guidance for assessing effects of drought agreed at the global level and in use by many countries.** Countries have already embraced the indicators in table 2 below, all of which can contribute to national to global monitoring of drought. While these indicators are reported individually, they can be analysed together to provide an assessment of the effects of drought in way that can also help track the influence on drought resilience attributable to sustainable land management (SLM). The SPI technical report provides detailed information on the indicators and the methodological approaches used for drought resilience assessments, and maps these to relevant Sustainable Development Goal (SDG) targets and indicators.

Table 2
Globally agreed indicators that can contribute to drought resilience monitoring at national and global levels, and their sensitivity to the influence of sustainable land management

Focus	*Indicator definition (methodological guidance)*	*Custodian (SDG Tier classification)*[a]	*Sensitivity to SLM*[b]
People exposed to drought and Degree of vulnerability to drought	Trends in the proportion of total population exposed to drought Trends in the degree of drought vulnerability (Good Practice Guidance for National Reporting on UNCCD Strategic Objective 3)	UNCCD (not an SDG indicator)	Exposure indicator: No Vulnerability indicator: Yes
Peoples' livelihoods and economies	SDG indicator 1.5.2: Direct disaster economic loss in relation to global gross domestic product (United Nations Statistics on SDG indicator 1.5.2 and SDG indicators metadata repository for target 1.5)	UNDRR (Tier II)	Yes
Hydrological imbalance and relation to land and water management for economic development and ecological sustainability	SDG indicator 6.4.2: Level of water stress: freshwater withdrawal as a proportion of available freshwater resources (FAO on SDG indicator 6.4.2 and Step-by-step methodology for monitoring water stress 6.4.2)	FAO (Tier I)	Yes
Land degradation and national systems for target-setting and monitoring to manage land sustainably and increase resilience to drought	SDG indicator 15.3.1 Proportion of land that is degraded over total land area (UNCCD Good Practice Guidance for Sustainable Development Goal Indicator 15.3.1)	UNCCD (Tier I)	Yes
Social capability to plan, govern and cooperate effectively to reduce disaster risk	SDG indicator 1.5 3 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030; SDG indicator 1.5.4 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies (SDG indicators metadata repository for target 1.5)	UNDRR (Tier II)	Yes, if SLM makes up part of the national disaster risk reduction strategy and local plans

Abbreviations: FAO = Food and Agriculture Organization of the United Nations; SDG = Sustainable Development Goal; SLM = sustainable land management; UNCCD = United Nations Convention to Combat Desertification; UNDRR: United Nations Office for Disaster Risk Reduction.

Notes:

[a] Tier classification for global SDG indicators <https://unstats.un.org/sdgs/iaeg-sdgs/tier-classification/>.

Tier 1: Indicator is conceptually clear, has an internationally established methodology and standards are available, and data are regularly produced by countries for at least 50 per cent of countries and of the population in every region where the indicator is relevant.

Tier 2: Indicator is conceptually clear, has an internationally established methodology and standards are available, but data are not regularly produced by countries.

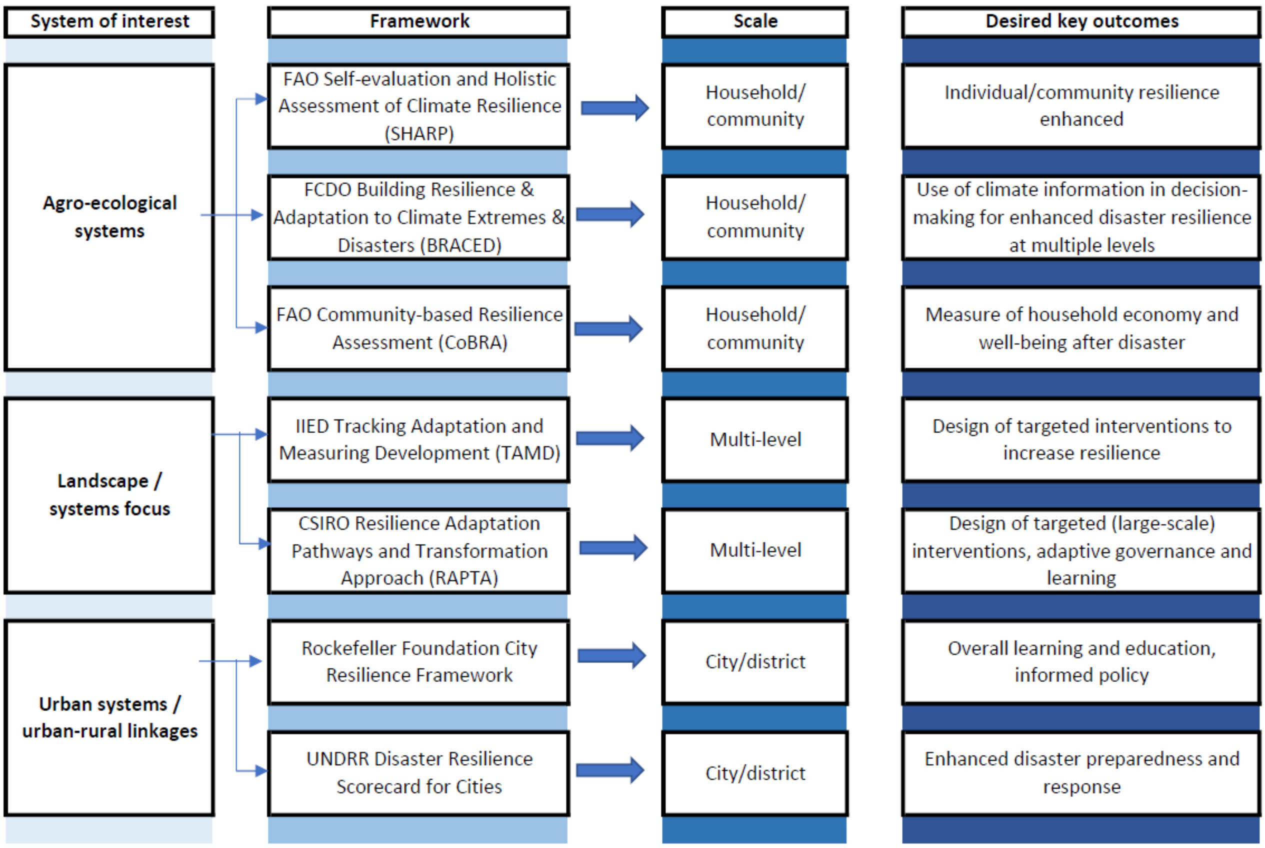
Tier 3: No internationally established methodology or standards are yet available for the indicator, but methodology/standards are being (or will be) developed or tested.

[b] In this table, it is assumed that the SLM practices introduced would be drought-smart, as stated in document ICCD/COP(14)/CST/3.

(c) **A diversity of resilience measurement frameworks and assessment tools available.** Though not developed specifically for drought, there are a number of resilience frameworks and assessment tools available that are pertinent for drought resilience assessments (see figure 1). Each framework comes with assessment tools and unique definitions, methodologies and data requirements. Approaches can be selected depending on the key resilience component of interest (whether this be disaster risk reduction, farmer resilience, or urban connectivity and capacity).

Figure 1

Resilience assessment frameworks based on systems of interest



Abbreviations: FAO = Food and Agriculture Organization of the United Nations; FCDO = Foreign, Commonwealth and Development Office; IIED - International Institute for Environment and Development; UNDRR = United Nations Office for Disaster Risk Reduction.

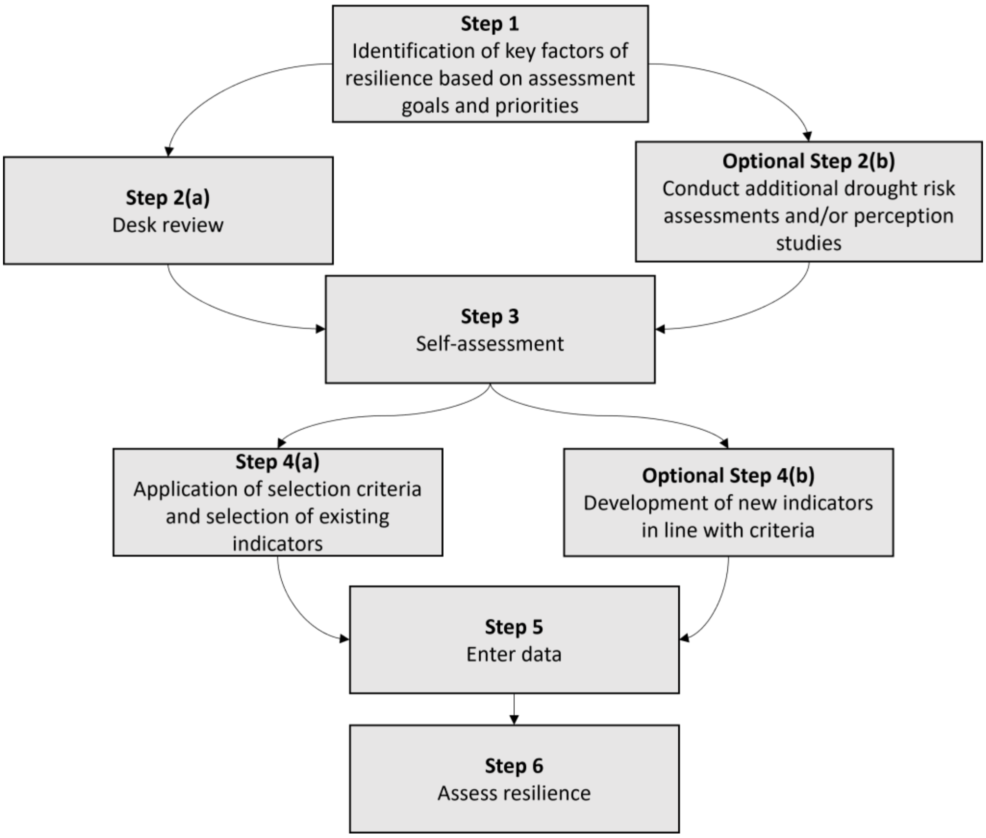
16. These different approaches to framing resilience have led to variation in the application of the resilience concept. From a UNCCD policy perspective, applying a systemic, landscape-level approach will yield the best results due to the complex interlinkages between socio-ecological systems. The selection of tools can be derived from

drought resilience assessment objectives as well as other national social, economic and environmental objectives. The SPI technical report provides detailed information on these frameworks and their underlying methodologies and indicators, along with practical examples of their application.

C. Roadmap for drought resilience assessments

17. The SPI technical report includes a roadmap on how to identify, select and use indicators to measure and assess drought resilience. The roadmap provides a flexible, scalable and stepwise approach to describing the options available so that indicators responsive to specific national and local contexts can be selected and applied appropriately (figure 2). The technical report further provides the methodologies of the indicators as well as practical examples of their application.

Figure 2
Steps to conduct a resilience assessment



1. Step 1: Identification of key factors of resilience based on assessment goals and priorities

18. While the entry point for measuring and assessing resilience varies by country, in most cases the institutions responsible for the assessment must start by assessing existing and projected drought risks. The goals and priorities set should ideally be reflected in relevant policies and/or ongoing policy processes addressing drought risks.[4] Relevant

[4] The relevant national policies have been compiled for the UNCCD intergovernmental working group stocktake and are available at: <https://www.unccd.int/sites/default/files/relevant-links/2021-11/stocktaking%20policies%20final-final.pdf>.

stakeholders across multiple sectors and levels must have consensus among their main goals and priorities in undertaking the assessment and define their target area of interest.

2. Step 2: Desk review

19. The assessment should build on a thorough desk review of relevant policies and climate risk and disaster studies. The desk review should include the development of an inventory of data and indicators already in use as part of national or international reporting obligations. If drought-specific studies and reports are not available at the relevant scale or depth of evidence, an intermediate step involving additional drought risk assessments, coupled with perception studies, will lead to a better understanding of the context.

3. Step 3: Self-assessment

20. A self-assessment of capacities – technical, financial and institutional – will further highlight which gaps need to be addressed before undertaking a drought resilience assessment and serve as a basis for securing the necessary financing and resources. Countries must decide if they wish to generate information at a high level of accuracy and specificity; focus on capturing the multi-dimensionality of drought through a participatory policy process; or conduct a basic, indicative assessment that fulfils multiple reporting obligations in both the domestic and international contexts. Each option represents a trade-off between accuracy, multi-dimensionality and technical effort.

4. Step 4: Application of selection criteria and selection/development of indicators

21. After the application of appropriate selection criteria (based on steps 1–3), countries or institutions may choose a relevant set of indicators for measuring and assessing resilience. It is recommended to use fewer indicators that give approximate measures of key dimensions of resilience instead of choosing a variety of detailed indicators on many potentially relevant but less critical elements of drought resilience, as credibility and feasibility may be more important than accuracy. Applying best practices for drought impact and resilience assessments to this context, a grounded, bottom-up process is recommended, allowing for an inclusive and proactive approach that focuses on people and their livelihoods, captures changes in the production of ecosystem services, and accounts for vulnerability effects on the water balance at basin and sub-basin levels. Countries may also choose to undertake a top-down assessment using global indicators (such as SDG indicators) and combine them with a spatial, geographic information systems-based approach, ultimately linking this with the bottom-up approach described above.

5. Steps 5 and 6: Enter data and assess resilience

22. The final step of the process is to enter the collected data and assess resilience, guided by any one of the well-established resilience assessment frameworks applicable across different temporal and spatial scales, such as those included in figure 1.

23. The SPI technical report recommends classifying ecosystem and/or social resilience into five resilience levels, either separately for each indicator or by combining them to assess all dimensions of resilience together. The five levels of resilience are defined as:

(a) Very low: unable to cope with droughts (i.e. drought will lead to permanent ecological/social impacts);

(b) Low: able to cope with droughts and avoid ecological/social collapse, but will experience significant disruptions; will lose the capacity for long-term adaptation, learning and transformation;

(c) Medium: able to cope with droughts, but will experience significant disruptions; will maintain the capacity for long-term adaptation, learning and transformation;

(d) High: able to cope with droughts with minor disruptions; will fully maintain the capacity for long-term adaptation, learning and transformation;

(e) Very high: fully capable to cope with droughts without any disruptions; will fully maintain the capacity for long-term adaptation, learning and transformation.

III. Conclusions and recommendations

24. The SPI technical report identifies and provides science-based evidence on the approaches to the assessment and monitoring of the resilience of vulnerable populations and ecosystems to drought, also taking into account the effect of climate change on drought risk. The SPI drew six conclusions that support the vision of the UNCCD 2018–2030 Strategic Framework: "A future that avoids, minimizes, and reverses desertification/land degradation and mitigates the effects of drought in affected areas at all levels and strive to achieve a land degradation-neutral world consistent with the 2030 Agenda for Sustainable Development, within the scope of the Convention."[5]

A. Conclusion 1 on drought resilience assessment and monitoring

25. Building drought resilience requires assessing and monitoring the resilience of ecosystems and vulnerable populations to drought. If done systematically, it makes it possible to track the ability of a socio-ecological system to anticipate, absorb, accommodate, adapt to or recover from effects of drought in a timely and efficient manner. Monitoring and assessment of drought resilience contributes to moving from 'reactive' to 'proactive' drought response regimes, which includes the ability to absorb drought hazard and adapt to stress and changes through sustainable land and water management while retaining the functioning of the ecosystems and societies.

26. The SPI technical report includes a roadmap for drought resilience assessment by providing a flexible, scalable and stepwise approach tailored to national or local conditions and circumstances. Supplementary guidance is also provided on how to identify, select and use indicators to measure and assess drought resilience associated with natural, economic, social, human, and physical capital concepts, as well as indicators useful for assessing effects of droughts and changes attributable to the application of SLM.

27. The roadmap is supplemented by information on a wide range of well-established resilience frameworks and assessment tools which can be employed. The entry point and process for measuring and assessing resilience varies by country, but in most cases the institutions responsible for the assessment must start out with a clear understanding of their primary goals and priorities in measuring drought resilience. Approaches can be selected depending on the key resilience component of interest, for example disaster risk reduction, farmer resilience or the connectivity and capacity of socio-ecological systems including urban–rural dynamics.

28. The assessment should build on a thorough desk review of relevant policies, literature, and an inventory of data and indicators already in use. Countries that are reporting on land degradation neutrality targets or other resilience-framed SDG targets may find it easier to start drought resilience assessments because they are already collecting relevant indicators and data. A self-assessment of capacities – technical, financial and institutional – will further highlight which gaps need to be addressed before undertaking such an assessment and serve as a basis for securing the necessary financing and resources. Finally, countries may embark on data collection and an assessment of their resilience to drought.

[5] Decision 7/COP13, Annex , paragraph 4 <https://www.unccd.int/official-documentscop-13-ordos-china-2017/7cop13>.

B. Conclusion 2 on monitoring drought impacts

29. Drought is a highly complex natural hazard, with multiple direct and indirect, short-term and long-term impacts. The information on past impacts and costs of droughts represents an important building block for the continuous monitoring of drought resilience. Systematically collecting, monitoring, reviewing, prioritizing and assessing information on drought impacts is necessary to mitigate the effects of future droughts on vulnerable people and ecosystems. The information provided is necessary to enhance the capacity of a country to cope with, adapt to and recover from drought.

30. Drought impacts are both direct such as reduced crop yields, but also indirect in terms of human health, social inequality, including gender inequality, and poverty. If drought impacts are assessed and tracked over time, the information base will evolve in response to changes in drought-related vulnerabilities, exposures and hazards.

31. Information on drought impacts is also essential to support integrated drought risk management and contributes to national drought plans and policies, as well as to ongoing discussions on loss and damage, returns on investments, and natural capital accounting, including the System of Environmental-Economic Accounting prepared under the auspices of the United Nations Committee of Experts on Environmental-Economic Accounting.[6]

32. Information collected on drought impacts needs to be based on systematic and comparable approaches. To enable drought impact collection and risk assessments at national, subnational and local levels, countries and institutions conducting this work may consider using systematic and comparable approaches, such as the Post-Disaster Needs Assessments Guidelines developed by the Global Facility for Disaster Reduction and Recovery,[7] **a global partnership that helps countries better understand and reduce their vulnerability to natural hazards and climate change.**

33. Monitoring drought impacts is also essential for ascertaining the influence of drought-smart sustainable land and water management interventions.

C. Conclusion 3 on monitoring ecosystem drought risk

34. Drought risk information is more likely to be available for social and economic systems, however drought risk information for natural and managed ecosystems is also essential. Monitoring ecosystem drought risk is particularly important in areas that are on the brink of ecological collapse and more vulnerable to climate change and the effects of drought. Further actions are required to address gaps in the assessment and monitoring of drought risk in natural and managed ecosystems.

35. The monitoring of drought risk should focus on the projected effects of drought on ecosystem services and natural capital that enable ecosystems and populations to sustain themselves during drought.

36. The monitoring of drought risk can provide information for the development and promotion of drought impact mitigation initiatives by means of ecosystem conservation and restoration, and drought-resilient water and crop management practices.

D. Conclusion 4 on impacts of climate change on drought resilience

37. Although drought is a natural phenomenon affecting all regions, the changing climate and human pressures on land and water have exacerbated and will likely

[6] <https://unstats.un.org/unsd/statcom/52nd-session/documents/BG-3f-SEEA-EA_Final_draft-E.pdf>.

[7] <https://www.gfdrr.org/en/publication/post-disaster-needs-assessments-guidelines-volume-2013>.

further exacerbate the intensity, frequency and severity of droughts effects in terms of direct and indirect costs and duration.

38. It is recognized that under climate change, drought is not only determined by precipitation, but also depends on atmospheric evaporative demand and evapotranspiration. Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Continued global warming is projected to further change the global water cycle, including its variability, the global monsoon precipitation and the severity of wet and dry events.

39. The frequency and intensity of agricultural and ecological droughts in some regions will increase in direct relation to increasing global warming, potentially leading to cascading effects across sectors resulting in economic losses. The effects of drought become particularly severe where terrestrial reserves of water have been depleted and not yet replenished following previous droughts. A wide range of ecosystems are currently threatened by climate change-intensified droughts. Under certain conditions, these droughts can overwhelm the resilience of ecosystems and lead to major shifts in ecosystems or even their collapse.

40. It is also recognized that a system may be resilient to short and mild drought, but not resilient to a long and severe drought. Of equal concern, a system may be resilient to drought at present conditions, but its resilience can be reduced due to future increasing frequency/severity of droughts as consequence of climate change.

41. Drought resilience assessments must therefore take into account the influence of climate change and its interactions with land, and how land is managed and used. This will be particularly important in the estimation of future drought risk. More information on land–climate interactions, the role of advanced technologies to support monitoring, and how this might be incorporated into early warning systems is available in document ICCD/COP(15)/CST/4.

E. Conclusion 5 on drought resilience assessment and early warning

42. Drought risk management and mitigation decisions require information that can be provided through drought early warning systems, including changes in meteorological trends. Ideally these systems would also track key ecological and social indicators so that changes in the capacity of socio-ecological systems to absorb, adapt to and recover from anticipated effects of droughts can be monitored.

43. The systematic integration of the findings from socio-ecological drought resilience assessments into early warning systems is essential for raising the effectiveness and efficiency of proactive drought risk mitigation measures. This allows for the activation of triggers that will not only (i) signal managers responding to drought to take responsive drought relief action when, for example, reservoir levels fall too low to withstand anticipated droughts; but also (ii) provide decision makers with the information necessary to determine what needs to be done proactively for drought preparedness; as well as (iii) guide investments in drought-smart sustainable land and water management designed to enhance overall resilience.

F. Conclusion 6 on science-based operational definitions

44. Effective drought resilience assessment can be enhanced through the harmonization of terminology and definitions used. In particular, there is a need to establish two science-based operational definitions on drought resilience with a focus on building resistance to impacts and generating benefits. Of particular need are:

(a) A constrained working definition of resilience to drought that focuses on resistance to the impacts and risks of drought, and which would be measurable in terms of reductions in drought effects on populations and ecosystems; and

(b) A definition of resilience to drought that would focus on capturing and measuring the positive benefits achievable by building resilience to drought in addition to reducing risks and negative impacts, ideally addressing the different forms of capital (e.g. natural, economic, social, human, physical).

45. Parties may wish to consider these conclusions resulting from the SPI's technical report titled Multiscale Approaches for Assessment and Monitoring the Resilience of Vulnerable Populations and Ecosystems to Drought when engaging in consultations on a draft decision to be considered by the COP based on the draft text for negotiations that can be found in document ICCD/COP(15)/CST/8, which, following decision 32/COP.14, contains all draft decisions prepared for Parties for consideration at CST 15.