CSFD

Desertification and land degradation trend indicators

A joint collaboration: French Scientific Committee on Desertification / European DesertNet / DesertNet International / International Federation of Agricultural Producers (CSFD/EDN/DNI/IFAP)

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A working group pooling members of the international scientific community and civil society was formed in 2008 as a French initiative. It aims to address the imperatives outlined in the United Nations Convention to Combat Desertification: developing a minimum set of indicators to help policy makers assess desertification and land degradation trends on different scales and also to implement the Strategic Objectives.

This will ultimately lead to the development of a series of simple indicators, while specifying all aspects to facilitate their use: from the method to the availability of primary data, in addition to their feasibility and associated costs.

The United Nations Convention to Combat Desertification (UNCCD) adopted a 10-year Strategic Plan at the 8th Conference of the Parties in Madrid (2007), which referred to indicators to enable:

- decision makers to evaluate applications of this strategy and progress achieved on the operational objectives;
- drawing up of national and regional reports;
- assessment of land degradation and desertification trends on different scales, progress achieved through local projects, and the impact of public policies, etc.

The French Scientific Committee on Desertification (CSFD) decided, in the second half of 2008, to launch a working group on indicators to generate data for scientists in the European Union and the UNCCD Committee on Science and Technology, with the support of the French Ministry of Ecology, Energy, Sustainable Development and the Sea in charge of green technologies and climate change negociations. These data are taken into consideration by the group of experts commissioned by the Convention to develop a minimum set of indicators (Len Berry *et al.*), and by working groups of the Dryland Science for Development consortium that is responsible for organizing the scientific conference on this topic within the framework of the UNCCD Conference of the Parties in 2009.

This work is carried out in cooperation with European DesertNet (EDN), which includes over 300 scientists from 51 countries. Civil society organizations have also been actively participating in this indicator inventory, along with (amongst others) the International Federation of Agricultural Producers (IFAP) since 2008.

A useful tool for civil society and decision makers

The study framework is not strictly scientific, since the users are decision makers and field staff. The minimum set of indicators should be validated by the scientific community with **simple** messages and **applicable** results. It is essential not to overlook people who will make use of the observations and measurements. The indicators should thus be simple, easy to measure, applicable and readily interpreted by non-scientists and adoptable by users: decision makers, NGOs, professional agricultural organizations, etc. They should also address clearly defined objectives. A few shortcomings should, however, be mentioned.

■ **The indicators are not universal.**
They are not simply 'raw' data. They are included in environmental, historical and institutional settings. A set of indicators that is relevant for one site and given time may not be suitable for another site and time because of the change in setting. The indicators thus have spatiotemporal validity limits. It is hard to define indicators that generate information at different implementation levels (global to local). There may be no universal symbols and signs of land degradation and of successful fights against desertification. Moreover, a list of indicators is not permanent and may change over time according to changes in settings.

■ **The indicators can be unclear.**
They should be used with caution because the interpretations may be totally contradictory. For instance, an increase in the number of power pumps may be interpreted as a sign of national or local development, whereas it could also be interpreted as a desertification factor!

■ **The indicators should be reliable and significant.** They help to interpret a real situation permanently and continuously since they measure changes such as an improvement (or not) in population conditions. They should enable assessment of a state at a given time as well as its temporal variation.

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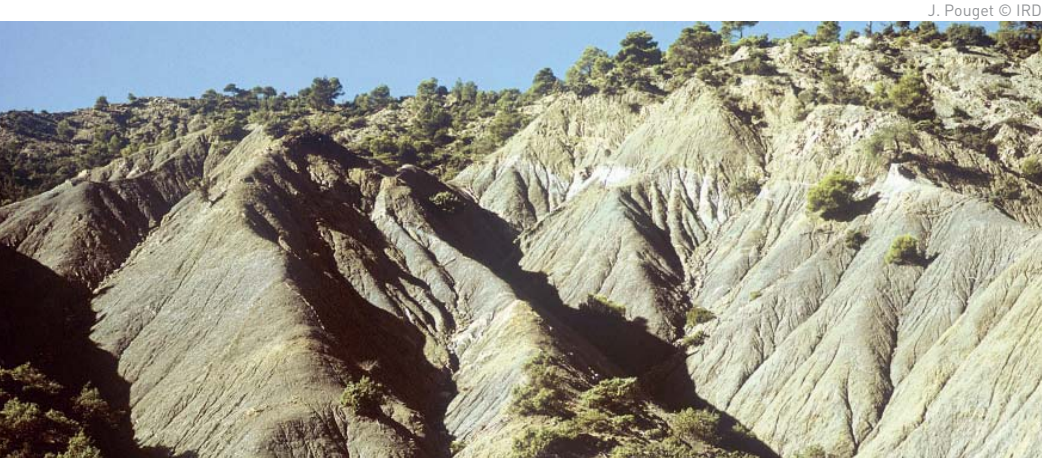

Developing SMART indicators: Specific, Measurable, Attainable, Realistic, Timely and Affordable?

In the light of these shortcomings, the working group decided to select **existing and already tested indicators.** A broad ranging literature review was thus carried out and the statistical databases of the main international organizations were surveyed (FAO, World Bank, GEF, UNEP, etc.). A list of around 300 indicators, supplemented by those proposed by IFAP and EDN, was reviewed according to the relevance of the indicators in addressing the Convention's strategic objectives.

This first selection was then classified according to different criteria:
■ The Convention's strategic objectives: alleviating poverty, etc.
■ The topic investigated: Institutional and governance; Land use and plant cover; Socioeconomy; Vegetation and fauna; Water and soils.
■ The analysis and implementation scale: local or global.
■ Land degradation causal indicators.
■ Land degradation effect indicators.

Four indicator working lists were drawn up:
■ national data to characterize each country, available in national statistical databases;
■ national (or regional) indicators **(cf. list on following page);**
■ local indicators derived from field and specific surveys of local situations;
■ significant, but more complex, indices of situations and trends, and pooling of several indicators.

■ **Their measurement and application costs should be low.** The proposed indicators should be in line with the capacity of institutions that measure and interpret them. This could depend on the availability and type of required data (database, field collection, remote sensing, etc.) and the method required to obtain the information.

▶ Table: National assessment indicators included in the Strategic Objectives of the Convention—Proposal of the CSFD/EDN/DNI/IFAP working group

NB: Some of these national indicators may also apply locally.

Strategic objective 1: To improve the living conditions of affected populations

■ S1: Decrease in numbers of people negatively impacted by the processes of desertification/land degradation and drought.

■ S2: Increase in the proportion of households living above the poverty line in affected areas.

■ S3: Reduction in the proportion of the population below the minimum level of dietary energy consumption in affected areas.

Strategic objective 2: To improve the condition of affected ecosystems

■ S4: Reduction in the total area affected by desertification/land degradation and drought.

■ S5: Increase in net primary productivity in affected areas.

Strategic objective 3: To generate global benefits through effective implementation of the UNCCD

■ S6: Increase in carbon stocks (soil and plant biomass) in affected areas.

■ S7: Areas of forest, agricultural and aquaculture ecosystems under sustainable management.

Strategic objective 4: To mobilize resources to support implementation of the Convention through building effective partnerships between national and international actors

■ S8: Increase in the level and diversity of available funding for combating desertification/land degradation and mitigating the effects of drought.

■ S9: Development policies and measures address desertification/land degradation and mitigation of the effects of drought

#	Selected national indicators	UNCCD Objectives								
		S1	S2	S3	S4	S5	S6	S7	S8	S9
1	Total number of people killed & affected by natural disasters, especially droughts (number)	X								
2	% of total population with access to safe drinking water (%) - Urban and rural zones	X	•							
3	Water availability (per capita) (m^3/y/capita)	X	•	•						
4	Annual production of main crops per capita (Mt/y/capita)	X		•				•		
5	% of population below national poverty line or otherwise with under US$1 (or US$2)/day		X							
6	GINI Index (dimensionless)		X							
7	Economic loss per capita due to natural disasters and related to droughts and floods (US$)	•	X							
8	% of population below the minimum caloric intake			X						
9	Prevalence of underweight children less than 5 years old			X						
10	Land cover (ha, %): different types (forest, urban, woodlands, etc.)				X			•		
11	Land use (ha, %): different classes (total, permanent agriculture, etc.)				X					
12	Bush fires: location, area (ha) and periods				X			•		
13	Biodiversity integrity index				X	•				
14	Area (ha) and seasonal availability of surface water bodies				X					
15	Edaphic indicator of soil surface change due to wind				X					
16	Total area affected by salinization (ha, % p/y)				X			•		
17	Average annual soil erosion rate (t/ha)				X					
18	Area of the different vegetation cover components (ha)					X				
19	Global vegetation index (to be linked to rainfall)				•	X				
20	Carbon stock in soil (tonnes C/ha)						X			
21	Existence of firewood policies							X		
22	Existence of legislation on pastoral resource access							X		
23	Herders' and farmers' associations (number)							X		•
24	Measures and participative networks for natural resource management							X		•
25	Forests certified by the Forest Stewardship Council—FSC (ha)							X		
26	% of production through certified channels (t)							X		
27	Associations of organic and/or fair trade farmers (number)							X		
28	Intensity of forest use (harvest/growth)				•			X		
29	Use of chemical fertilizers on crop fields (t/ha)							X		
30	Use of chemical pesticides on crop fields (t/ha)							X		
31	% of firewood in domestic consumption							X		
32	Herd mobility, transhumance							X		
33	Increase in sustainably managed land area (ha)							X		
34	Number of farmers paid for environmental services and sustainable land management							X		
35	Variation in endemic species number							X		
36	Abundance of key selected species (number)							X		
37	Abundance of invasive alien species (number)							X		
38	Forest fire location and area (ha)				•			X		
39	Genetic variability in local cultivated plants				•			X		
40	% of national budget dedicated to sustainable land management								X	
41	% of public support for national sustainable land management								X	
42	Funds allocated to scientific research on land degradation and management (US$)									X
43	Enhancement of policy, legal and regulatory framework (incl. funding and incentives)								•	X
44	% of development programme funding used by civil society								•	X
45	Existence of an agricultural price regulation system									X

X Key indicator
• Secondary indicator

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▶ French Scientific Committee on Desertification

CSFD, which was founded in September 1997 by French ministries in charge of UNCCD, provides expertise, advice and support for French and international political bodies. It produces and disseminates scientific information for stakeholders involved in combating desertification. It serves as a key interface between science, French and international civil society. It includes a President and around 20 members from different disciplinary fields and the main concerned French organizations. It is funded by French ministries in charge of UNCCD and the French Development Agency.

www.csf-desertification.org
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▶European DesertNet / DesertNet International

EDN/DNI is an international multidisciplinary network of over 300 scientists from 51 different countries conducting research on land degradation and desertification. It serves as a platform for scientific discussion on these topics.

www.european-desertnet.eu
Contact: Mariam Akhtar-Schuster (EDN Secretariat), makhtar-schuster@botanik.uni-hamburg.de

▶International Federation of Agricultural Producers

IFAP is a global farmers' federation. It was founded in 1946 and now represents over 600 million family farms pooled in 115 national organizations in over 80 countries. It serves as a forum where heads of national farmers' organizations can meet, exchange ideas and identify common priorities. The Federation also advocates farmers' interests with respect to international organizations. Finally, it is actively promoting the creation and strengthening of agricultural producers' organizations throughout the World. IFAP has a General Consultative Status with the Economic and Social Council of the United Nations.

www.ifap.org
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Finally, for each selected indicator, the working group will present—in the form of fact sheets—all information that end users will need to apply them:

- Indicator name, definition and unit
- Convention strategic objective(s) for which the indicator applies
- Topic(s): Soil and water, Vegetation and fauna, etc.
- Justification for using the indicator
- Spatial scales
- Indicator validity period
- Methods (methods for data collection, measurement, calculation, etc.) and by whom
- Availability of primary data acquired by national institutions and research programmes
- Availability of primary data in international institutions
- Cost of acquiring data required for indicator calculation (indications)
- Interpretation, thresholds, benchmarks and validity limits
- References and bibliography

▶ For further information:

www.csf-desertification.org/indicateurs
www.european-desertnet.eu/cop9_prep_eu.php

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