

EarthTrends: Featured Topic

Title: An Ecosystem Approach to Drylands: Building Support for New Development Policies

Author: Robin White, Dan Tunstall, Norbert Henninger

Source: An Ecosystem Approach to Drylands: Building Support for New Development Policies

Date Written: January 2003

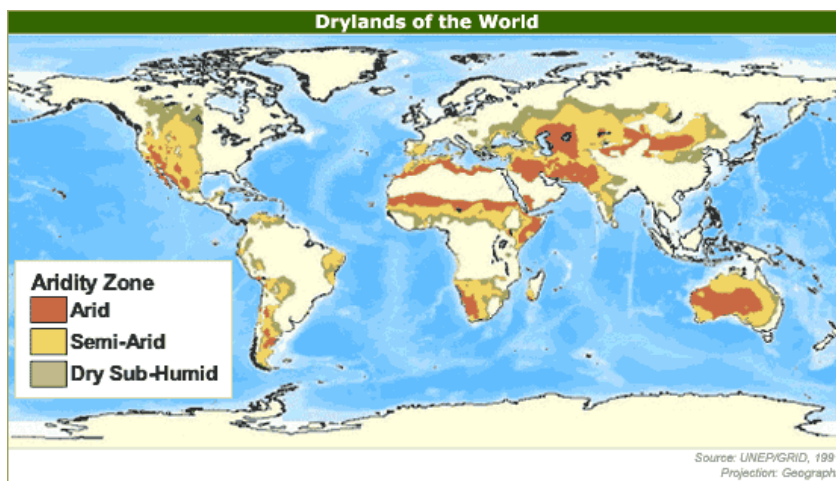
Despite concerted efforts, dryland issues have failed to capture sufficient global attention to propel rapid progress in curbing land degradation and alleviating poverty in drylands. Recent initiatives and assessments affecting drylands management

ecosystem approach to drylands monitoring and assessment, on the other hand, holds great promise for building support for enhanced dryland management, development, and investment, precisely because of its more comprehensive, forward-looking focus.

biodiversity conservation, water quality, and carbon storage, as well as commodities such as food, fuel, and fiber.

An ecosystem approach simultaneously evaluates how human use of an ecosystem affects its functioning and productivity. By integrating social and economic information with environmental information about the ecosystem, the approach explicitly links human needs to the biological capacity of ecosystems to fulfill those needs. For example, it accounts for scale, social considerations, and management practices when identifying specific objectives for drylands. It thus incorporates statistics in areas that previous initiatives have neglected or treated exclusively, like the importance of local, national, and global considerations, poverty alleviation, and physical and biological limitations of the soil. The approach then taps into this reservoir of quantitative data to make tradeoffs efficient, transparent, and sustainable, bearing future generations in mind.

This approach also recognizes that ecosystems function as whole entities, and cannot be managed effectively in pieces, or solely according to political boundaries. The approach thus focuses on protecting and conserving entire ecosystems. It views management as successful only if it preserves or enhances the capacity of a given ecosystem to produce a diverse array of goods and services over time, allowing for sustainable



and development have either been unable to attract sufficient funds, or too mired in procedural issues to effectively address problems at a local level. 40% of low-income countries are largely dryland, where livelihoods critically depend upon the sustainable management of dryland resources to survive. Yet, poverty reduction and debt relief measures fail to specifically factor in the management of drylands ecosystems to improve poor people's standards of living.

The support and policy challenges facing dryland initiatives stem from a limited approach to the issue—one which restricts itself to resolving the present problems of land degradation and food insecurity, rather than realizing the full potential of the numerous goods, services, and benefits offered by drylands. An

What Is An Ecosystem Approach To Management And Development?

An ecosystem-based approach is a strategy that examines drylands from a broader perspective. While traditional methods of dryland management concentrate on maximizing commodity production and agricultural yields, the objective of an ecosystem approach is to optimize the ecosystem's benefits by accounting for the entire range of goods and services that humans depend on to survive and prosper. This approach provides quantitative indicators for those non-commodity or non-market goods and services that are not adequately addressed in conventional techniques of monitoring and assessment, such as recreation, wildlife habitat,

Changing Approaches

Figure 2: Drylands Management and Traditional Agricultural Production
Contrasted With an Ecosystem Approach

Topic Area	Drylands Management and Traditional Agricultural Production	Drylands Management and an Ecosystem Approach
Objectives	<ul style="list-style-type: none"> ▪ Maximizes commodity production ▪ Aims to maximize or increase yields ▪ Maximizes net present value 	<ul style="list-style-type: none"> ▪ Maintains dryland ecosystems as an interconnected whole, while allowing for sustainable commodity production ▪ Aims to sustain dryland productivity over time while simultaneously considering tradeoffs with other dryland goods and services ▪ Maintains future options
Scale	<ul style="list-style-type: none"> ▪ Works within political or ownership boundaries 	<ul style="list-style-type: none"> ▪ Works at the ecosystem and landscape level
Role of Science	<ul style="list-style-type: none"> ▪ Views dryland management as an applied science focused on natural resources 	<ul style="list-style-type: none"> ▪ Views dryland management holistically, combining science and social factors
Role of Management	<ul style="list-style-type: none"> ▪ Focuses on preventing land degradation ▪ Emphasizes intensification of agriculture through more efficient use of land, labor, and capital ▪ Strives to avoid food insecurity and famine 	<ul style="list-style-type: none"> ▪ Focuses on protecting and conserving ecosystem goods and services ▪ Emphasizes maintaining or increasing the capacity of drylands to provide goods and services ▪ Strives to preserve the entire array of ecosystem goods and services

Source : Adapted from *World Resources Report 2000-2001*, Box 4.2, Page 227.

production of crops and other commodities.

Applying An Ecosystem Approach To Dryland Assessments

Specific goods and services to be considered when assessing drylands vary by region and by scale of analysis. Identifying indicators for each of the goods and services provided is crucial to understanding conditions and trends over time. The indicators selected will depend on data type and quality, as well as the periods for which information is available. Among the most common goods and services provided by drylands are forage and livestock; crops such as

cereals, roots, and tubers; woody vegetation for fuel; water resources for household, industrial, agricultural, and recreational purposes (although not abundant in many drylands); high levels of biodiversity; carbon storage for limiting concentrations of carbon dioxide in the atmosphere; tourism and recreation; and ties to global and local markets through international and regional trade, particularly strong with adjacent humid lands.

An assessment of dryland conditions and trends based on an ecosystem approach should also incorporate the effects of pressures stemming from human activities. Some human activities, such as agriculture and recreation, are sources of important goods and services as well as pressures on

drylands. The use of quantitative indicators enables examination of opportunities for producing goods and services as well as risks associated with such pressures.

For instance, an ecosystem-based dryland assessment should address the dramatic changes in drylands brought about by human settlements and urbanization. Besides leading to increased demand for water and sanitation services, urbanization increases runoff through the paving and compaction of soil. In high densities, domestic livestock with limited grazing land can change floristic composition, reduce biodiversity, increase soil erosion, and, in extreme

situations, eliminate vegetation cover. Conversion of dryland to agriculture replaces native vegetation with crops, and changes soil composition through fertilizer and pesticide use.

Over the next five decades, drylands will face significant challenges from climate change. A forecasted drier and hotter climate for large areas in Africa would reduce agricultural potential and could significantly alter livestock and crop production systems in drylands. Biodiversity, water supplies, and wood fuel production all could be negatively affected. Desertification, which may be influenced by climatological, social, political, economic, and cultural factors, can stress dryland systems and lead to decreased capacity to provide goods and services. An ecosystem approach would strive to provide accurate indicators for all these factors.

The Payoff: Profiting From An Ecosystem Approach

An ecosystem approach to dryland monitoring and assessment would equip decisionmakers with a powerful tool for creating and implementing more effective drylands policy. Quantitative indicators of dryland ecosystem

goods and services would aid institutions and stakeholders in their policy dialogues, environmental reporting and monitoring, and impact assessment. An ecosystem approach also would provide enhanced information for the critical examination of benefits and risks of

and institutions to spur development of indicators must be combined with measures to encourage communication of this information and its use in national policy dialogues, environmental reporting, environmental impact

assessment, and emergency relief. Ensuring that stakeholders have access to information needed for meaningful participation is critical if policies are to be reformed and implemented. Fortunately, due to its ability to attract attention to frequently overlooked yet profitable dryland goods and services, an ecosystem approach has the potential to generate the enthusiasm and investment needed to address the difficult problems facing dryland countries. Appealing to what people care about in dryland areas, the ecosystem approach recognizes problems at the local level as well as across multiple scales and time dimensions. Its implementation would likely attract and sustain the interest of development agencies, governments, national delegates to the UN Convention to Combat Desertification (CCD), other international conventions, and the general public. If these organizations were to undertake an ecosystem approach to monitoring and assessment, much progress could be made in the revitalization and coordination of contemporary initiatives in dryland development and poverty reduction.

How to Assess Drylands Goods and Services	
Figure 3: Indicators for Drylands Goods and Services	
Goods	Indicators
<i>Forage and Livestock</i>	Livestock production Soil condition Vegetation condition
<i>Food</i>	Crop yields Variation in cereal production Food aid Amount of irrigated land Soil fertility
<i>Woodfuel</i>	Amount of woody vegetation Use of traditional energy sources
<i>Freshwater Resources</i>	Watershed characteristics Water quantity Wetland locations/characteristics
Services	Indicators
<i>Biodiversity Conservation</i>	Centers of Plant Diversity (CPDs) Endemic Bird Areas (EBAs) Global 200 ecoregions Protected areas
<i>Carbon Storage</i>	Potential stores in vegetation Potential stores in soils Fire and biomass burning
<i>Tourism/Recreation</i>	Number of international tourists Tourism revenues
<small>Notes and Sources: Abbreviations: ASSOD: Assessment of the Status of Human-Induced Soil Degradation in South and Southeast Asia; ESA: European Space Agency; FAO: United Nations Food and Agriculture Organization; GLASOD: Global Assessment of Human-Induced Soil Degradation; IEA: International Energy Agency IFPRI: International Food Policy Research Institute; ILRI: International Livestock Research Institute; ISRIC: International Soil Reference and Information Centre; IUCN: World Conservation Union; NOAA: National Oceanic and Atmospheric Administration; UMD, Geography: University of Maryland, Geography Department; UNEP-WCMC: United Nations Environment Programme - World Conservation Monitoring Centre; USDA: United States Department of Agriculture; USGS: United States Geological Survey; WRI: World Resources Institute; WTO: World Tourism Organization; WWF-US: World Wildlife Fund-United States.</small>	

development, investment, and management alternatives.

Although quantitative indicators of ecosystem goods and services are an integral part of the ecosystem approach, it is true that the development of these indicators by themselves is not sufficient to stimulate a change in drylands development. Changes in policies

REFERENCES

- Davis, S.D., V.H. Heywood, and A.C. Hamilton. 1995. *Centres of Plant Diversity: A Guide and Strategy for their Conservation*, Vol. 2. IUCN-World Conservation Union and World Wildlife Fund.
- Davis, S.D., V.H. Heywood, and A.C. Hamilton. 1994. *Centres of Plant Diversity: A Guide and Strategy for their Conservation*, Vol. 1. IUCN-World Conservation Union and World Wildlife Fund.
- [ESRI] Environmental Systems Research Institute. 1993. *Digital Chart of the World CD-ROM*. Redlands, CA: ESRI.
- [FAO] Food and Agriculture Organization of the United Nations. 2001. Statistical Databases. Available at: <http://apps.fao.org>.
- [GEF] Global Environment Facility. 2001. Note on the Proposed Designation of Land Degradation as a GEF Focal Area. GEF/C.18/4/Rev.1 November 13, 2001. Available at: <http://www.undp.org/gef/>.
- [GLCCD] Global Land Cover Characteristics Database. 2000. Version 1.2. Available at: <http://edcdaac.usgs.gov/glcc/glcc.html>.
- [IISD] International Institute for Sustainable Development. 2001. Summary of the Fifth Conference of the Parties to the Convention to Combat Desertification: 1-13 October 2001. *Earth Negotiations Bulletin* (4)160:1-16.
- Kristjanson, P.M., P.K. Thornton, R.L. Kruska, R.S. Reid, N. Henninger, T.O. Williams, S. Tarawali, J. Niezen, and P. Hiernaux. 2001. *Mapping Livestock Systems and Changes to 2050: Implications for West Africa*. Paper prepared for the international conference on Sustainable Crop-Livestock Production for Improved Livelihoods and Natural Resource Management in West Africa. Ibadan, November 19-21, 2001.
- [NOAA/NGDC] National Oceanic and Atmospheric Administration/National Geophysical Data Center. 1998. *Stable Lights and Radiance Calibrated Lights of the World CD-ROM*. Boulder, CO: NOAA-NGDC.
- [OECD] Organisation for Economic Co-operation and Development. 2001. *DAC Guidelines on Poverty Reduction*. Available at <http://www.oecd.org>.
- Olson, D.M. and E. Dinerstein. 1997. *The Global 200: A Representation Approach to Conserving the Earth's Distinctive Ecoregions*. World Wildlife Fund, draft manuscript.
- Toulmin, C. 2001. *Lessons from the Theatre: Should this be the Final Curtain Call for the Convention to Combat Desertification?* International Institute for Environment and Development (IIED) in collaboration with the Regional and International Networking Group (RING). Available at <http://www.iied.org>.
- Stattersfield, A.J., M.J. Crosby, A.J. Long, and D.C. Wege. 1998. *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. Birdlife Conservation Series No. 7. Cambridge: Birdlife International.
- [UNCCD] United Nations Convention to Combat Desertification. 1999. *United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa*. Text with Annexes. France.
- [UNEP] United Nations Environment Program. 1997. *World Atlas of Desertification*, 2nd edition. Edited by N. Middleton and D. Thomas. London: UNEP.
- [UNEP/GRID] United Nations Environment Program/ Global Resource Information Database. 1991. Global digital data sets for land degradation studies: a GIS approach. Prepared by U. Deichmann and L. Eklundh. GRID Case Study Series No. 4. UNEP/ GEMS and GRID. Nairobi, Kenya.
- [UNEP/WCMC] United Nations Environment Program/ World Conservation Monitoring Centre. 1999. Protected Areas Database. WCMC, unpublished data.
- Wint, W., J. Slingenbergh, and D. Rogers. 2000. Livestock Distribution, Production, and Diseases: Towards a Global Livestock Atlas. Consultants' Report, Food and Agriculture Organization of the United Nations. Rome, Italy.
- World Bank. 2001. The HIPC Initiative: Background and Progress through October 2001. The World Bank Group. Available at <http://www.worldbank.org>.
- World Bank. 2000a. "Enhancing World Bank Support to the Convention to Combat Desertification" (Work in Progress). The World Bank Group. Available at <http://wbln0018.worldbank.org>.

World Bank. 2000b. *World Development Indicators*. Washington, D.C.: World Bank.

[WWF-US] World Wildlife Fund-US. 1999. Ecoregions Database. WWF-US, unpublished database.