

**UNITED NATIONS ENVIRONMENT PROGRAMME
GLOBAL ENVIRONMENT FACILITY (GEF) GRANT REQUEST**

1. IDENTIFIERS

PROJECT NUMBER *[Implementing Agency Project Number not yet assigned]*

PROJECT NAME **Land Degradation Assessment in Drylands (LADA)**

DURATION 4 years from 1 January 2005

IMPLEMENTING AGENCY United Nations Environment Programme (UNEP)

EXECUTING AGENCY Food and Agriculture Organisation of the United Nations (FAO)

NATIONAL EXECUTING AGENCIES:

Argentina – for Latin America region
China – for East Asia region
Cuba – for Caribbean region
Senegal – for Francophone West Africa
South Africa – for Southern, Central and Eastern Africa region
Tunisia – for Near East, North Africa and Mediterranean region

REQUESTING COUNTRIES GLOBAL
ELIGIBILITY N/A

GEF FOCAL AREA **Land Degradation cross-cutting to Biodiversity, International Waters and Climate Change**

GEF PROGRAMMING FRAMEWORK Operational Program (OP)1: *Arid and Semi-arid Zone Ecosystems*; OP12: *Integrated Ecosystem Management* and; OP15: *Sustainable Land Management*

2. SUMMARY

LADA will develop tools and methods to assess and quantify the nature, extent, severity and impacts of land degradation on dryland ecosystems, watersheds and river basins, carbon storage and biological diversity at a range of spatial and temporal scales. It will also build the national, regional and international capacity to analyse, design, plan and implement interventions to mitigate land degradation and establish sustainable land use and management practices. These objectives will contribute to the **Environmental Goal** of GEF's Operational Program 1, namely the conservation and sustainable use of the biological resources of arid and semi-arid areas; OP12 – to catalyze widespread adoption of comprehensive ecosystem management interventions – and; to OP15 - mitigating the causes and negative impacts of land degradation on the structure and functional integrity of ecosystems through sustainable land management practices. *LADA* is consistent with the Strategic Priority on Targeted Capacity-Building in Sustainable Land Management (SLM-1). A contribution will be made to the **Developmental Goals** of UNCCD and UN multi-lateral agencies to improve people's livelihoods and economic well being.

To achieve these objectives, *LADA* will develop standardised and improved methods for dryland degradation assessment, with guidelines for their implementation in a range of scales. Using these methods, it will assess the regional and global baseline condition of land degradation with the view to highlighting the areas at greatest risk. These assessments will be supplemented by detailed local assessments that will focus on root cause analysis of land degradation and on local (traditional and adapted) technologies for the mitigation of land degradation. Areas where land degradation is well controlled will be included in the analysis. 'Best practice' guidelines will be

developed and the results widely disseminated in various media. The project is intended to make an innovative generic contribution to methodologies and monitoring systems for land degradation, supplemented by empirically-derived lessons from the six main partner countries involved in the project – Argentina, China, Cuba, Senegal, South Africa and Tunisia – up-scaled to countries within their regional remit.

3. COSTS AND FINANCING (MILLIONS US\$)

Project Component	Funding Source	Costs (in US\$ million)
GEF	Project	7.000
	PDF-A	0.025
	PDF-B	0.700
Sub-total GEF		7.725
Co-financing		
PDF-A & PDF-B	FAO	0.675
	UNEP	0.100
	GM	0.100
Project	FAO (in kind and cash)	1.600
	UNEP (in kind and cash)	0.350
	EU (cash)	1.000
	Italy (cash)	1.500
	GM (in kind and cash)	0.200
	UNCCD (cash)	0.100
	Participating countries (in cash and kind):	
	Argentina	0.500
	China	1.500
	Cuba	0.250
Senegal	0.280	
South Africa	0.500	
Tunisia	0.400	
	Total participating countries	3.430
Sub-total Co-financing		9.055
TOTAL PROJECT COST		15.180
TOTAL PROJECT COST INCLUDING PDF-A/B		16.780

4. ASSOCIATED FINANCING (MILLION US\$)

(See Annex A for listings of relevant projects)

International	US\$ 95.6 million ¹
National	US\$192.2 million

¹ Not including satellite imagery and remote sensing projects, estimated at US\$700 million

5. OPERATIONAL FOCAL POINT ENDORSEMENT

Not applicable

6. IMPLEMENTING AGENCY CONTACT

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ACRONYMS AND ABBREVIATIONS

ACSAD	Arab Center for the Studies of Arid Zones and Dry Areas
ADB	Asian Development Bank
Africover	A project aimed to establish a digital geo-referenced database on land cover and a geographic referential for the whole of Africa
AEIN	Africa Environmental Information Network
ASSOD	Assessment of Soil Degradation in South and Southeast Asia
CAS	Chinese Academy of Sciences
CGIAR	Consultative Group on International Agricultural Research
COP	Conference of Parties (to the Global Conventions such as UNCCD)
CSD	Commission on Sustainable Development
CST	Committee for Science and Technology (of the UNCCD)
DDC	Drylands Development Centre of UNDP
DEV/ODG	School of Development Studies, University of East Anglia, UK
Diversitas	International Programme for Biodiversity Science (of ICSU and UNESCO)
DPSIR	Driving Forces-Pressures-States-Impacts-Responses (<i>LADA</i> Conceptual Framework)
EA	Executing Agency (FAO)
EC	European Community
ECLAC	Economic Commission for Latin America and the Caribbean
EDC	EROS Data Center
EPIC	Erosion-Productivity Impact Calculator
EROS	Earth Resources Observation System (Data Center, US Geological Survey)
ESA	European Space Agency
ESB	European Soil Bureau (of the European Community)
ESRC	Economic and Social Research Council (of the UK)
EUROSEM	European Soil Erosion Model
FAO	Food and Agriculture Organization of the United Nations
FCCC	Framework Convention on Climate Change
GEF	Global Environment Facility
GFRA	Global Forest Resources Assessment
GFSM	Global Fibre Supply Model
GIS	Geographical Information System
GIWA	Global International Waters Assessment
GLASOD	Global Assessment of Human-induced Soil Degradation
GLCN	Global Land Cover Network
GM	Global Mechanism (of UNCCD)
GPA	Global Programme of Action (for Protection of Marine Environment from Land-based Activities)
GTOS	Global Terrestrial Observing System
IA	Implementing Agency (UNEP)
IAASTD	International Assessment of Agricultural Science, Technology and Development
ICARDA	International Centre for Agricultural Research in Dryland Areas
ICRISAT	International Centre for Research in the Semi-Arid Tropics
ICSU	International Council of Scientific Unions
IFAD	International Fund for Agricultural Development
IKONOS	Satellite generating images with very high spatial resolution
ILEIA	Centre for Information on Low External Input and Sustainable Agriculture
IPCC	Intergovernmental Panel on Climate Change
IRSSS	International Space Station Images
ISRIC	International Soil Reference and Information Centre
JPOI	Johannesburg Plan of Implementation
KFA 1000	Camera that provides the acquisition of coloured space photo images from the mission of "Resurs F1M" Russian Spacecraft
<i>LADA</i>	Land Degradation Assessment in Drylands
LCCS	Land Cover Classification System
LISS	Medium resolution Linear Imaging Self Scanner from the IRS Indian satellite series
MA	Millennium (Ecosystem) Assessment

MDGs	Millennium Development Goals
MODIS	Moderate Resolution Imaging Spectroradiometer
NAP	National Action Programme
NARS	National agricultural research services
NEPAD	The New Partnership for Africa's Development
NGO	Non-governmental organization
NOAA	National Oceanic and Atmospheric Administration of the United States of America
NRCS	Natural Resources Conservation Service (of the USDA)
NUTMON	Nutrient Monitoring project
OECD	Organization for Economic Co-operation and Development
OP	Operational Program (of the GEF)
OSS	Observatoire du Sahara et du Sahel
PDF	Project development funding phase, viz PDF-A, PDF-B (for GEF projects)
PRC-GEF	People's Republic of China and Global Environment Facility (Partnership on Land Degradation)
RAP	Regional Action Programme
RS	Remote Sensing
SARD	Sustainable Agriculture and Rural Development
SLEMSA	Soil Loss Estimation Model for Southern Africa
SLM-IM	Sustainable Land Management – Integrated Model
SOTER	Soil and Terrain Database
SOVEUR	Soil Vulnerability Assessment in Central and Eastern Europe
SPOT	Satellite Probatoire d'Observation Territoire
SRAP	Sub-Regional Action Programme
TPN-1	Thematic Programme Network of the UNCCD (Asia)
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEP	United Nations Environment Programme
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USLE	Universal Soil Loss Equation
WCMC	World Conservation Monitoring Centre
WEHAB	Water, Energy, Health, Agriculture and Biodiversity
WEPP	Water Erosion Prediction (model)
WOCAT	World Overview of Conservation Approaches and Technologies
WSSD	World Summit on Sustainable Development

BACKGROUND AND CONTEXT

GLOBAL SIGNIFICANCE OF LAND DEGRADATION

1. Land degradation has been recognised as a global problem associated with desertification and loss of biological diversity in arid, semi-arid and dry sub-humid zones (commonly called ‘drylands’).² As recognized by the GEF, “arid and semi-arid lands have suffered some of the worst forms of degradation, due to their fragility and increased pressure from growing and partially sedentarized populations.”³ Land degradation probably affects about 2.6 billion people in more than a hundred countries and over 33% of the Earth’s land surface⁴. Around 73 percent of rangelands in drylands are currently being degraded, together with 47 percent of marginal rainfed croplands and a significant percentage of irrigated croplands⁵.
2. International responses to land degradation have included the United Nations Conference on Desertification (UNCOD) in 1977 and the United Nations Conference on Environment and Development (UNCED) in 1992. The latter led to the adoption of the Convention to Combat Desertification (UNCCD) in 1994. Land degradation was reaffirmed at the World Summit on Sustainable Development (WSSD) in September 2002 as one of the major global environmental and sustainable development challenges of the 21st Century. The Summit called on the Global Environmental Facility (GEF) to designate land degradation as a new focal area to support the implementation of the UNCCD⁶. This proposal was embodied in the Beijing Declaration of the Second GEF Assembly⁷. It is also relevant that the GEF launched OP15 on Sustainable Land Management in July 2003 to make operational the designation of land degradation as a focal area.
3. Yet land degradation (and its associated term ‘desertification’) is a complex and contested topic. Different institutional actors differ in their understanding of the causes, degree, distribution and effects of land degradation. While long associated with drylands which cover some 47 percent of the globe’s surface⁸, land degradation is considered by many observers to be highly variable, discontinuous, arising from different causes and affecting people differentially according to their economic, social and political circumstances.⁹ Estimates as to the extent and impact of land degradation are conflicting.¹⁰ Land degradation is presumed to result in a

² The inter-linkages between land degradation and biodiversity are well recognised. See GEF Report of the STAP Expert Group Workshop On Land Degradation, Bologna, Italy, 14-16 June 1999.

http://www.gefweb.org/COUNCIL/GEF_C14/gef_c14_inf15.doc

³ GEF Operational Program 1: *Arid and Semi-Arid Zone Ecosystems*, para 1.23, page 1-10.

⁴ Adams, C.R. and H. Eswaran, 2000. Global land resources in the context of food and environmental security. pp. 35-50 in “*Advances in Land Resources Management for the 20th Century*”. 655 pp. eds. S.P. Gawande et al. New Delhi: Soil Conservation Society of India

⁵ Secretary General’s Report on Land Chapter of Agenda 21 to Commission on Sustainable Development (CSD8, UN, New York 2000), UNCED Agenda 21, Rio de Janeiro, 1992 and UNCCD, Paris, 1994.

⁶ World Summit on Sustainable Development (WSSD) 2002. Plan of Implementation.

⁷ Expanded Mandate of the GEF, 18 October 2002, para.2:

http://www.gefweb.org/Whats_New/Beijing_Declaration_-_English.pdf

⁸ UNEP 1997. *World Atlas of Desertification*. Editorial commentary by N. Middleton and D.S.G. Thomas. London: Edward Arnold

⁹ Mortimore, M. 1998. *Roots in the African Dust: Sustaining the Sub-Saharan Drylands*. Cambridge: Cambridge Univ. Press

¹⁰ Some sources routinely report that up to 70% of all drylands are ‘desertified’; others suggest that the figure is no more than 17% - see *Global Change Newsletter* No 54, June 2003: <http://www.igbp.kva.se>

reduction in economic potential of the land to support people, while at the same time affecting negatively a number of important global environmental attributes such as carbon storage, biodiversity and off-site pollution. Permanent loss of service provision by the land and irreversible biophysical change are implied.¹¹ There are also major implications for all global environmental conventions and most development goals.¹² The potential synergies between land degradation and its impacts on the one hand and other global environmental and developmental issues are many and complex¹³ and inadequately understood. At the core of many debates are the questions, “are the data to be believed?”¹⁴ “do humans cause deserts?”¹⁵ and “how can the degradation be controlled?”¹⁶ Answers range from the modestly optimistic to the wildly pessimistic, according to viewpoints and stakeholder perceptions.

Box 1: Extent and Immediate Causes of Land Degradation	
Degradation extent (million ha)	Immediate Cause
680	Overgrazing – about 20% of world’s pastures and rangeland have been damaged, especially recently in Africa and Asia.
580	Deforestation – large scale logging; clearance for farm and urban use. More than 220 m ha of tropical forests were destroyed 1975-90.
550	Agricultural damage – water erosion causes soil losses estimated at 25,000 million tonnes annually. Soil salinization and waterlogging affect about 40 million ha of land globally
137	Fuelwood – about 1730 million m3 of fuelwood are harvested annually from forests and plantations
19.5	Industry and urbanization – urban growth, road construction, mining and industry. Mainly a loss of agricultural land.

Sources: FAO 1996. *Our Land, Our Future*. Rome: UN Food and Agriculture Organization; UNEP 2002. *Global Environment Outlook 3*. Nairobi: United Nations Environmental Programme

4. The *root causes* (and *consequences*) of land degradation and desertification are usually ascribed to poverty and food insecurity combined with harsh climatic events such as drought, leading to excessive pressures on often fragile ecosystems, the natural resource base, and the adoption of resource depleting survival strategies by the poor. Its *immediate causes* are

¹¹ Oldeman, L.R., Hakkeling, R.T.A. & Sombroek, W.G. 1990. *World Map of the Status of Human Induced Soil Degradation*. Wageningen: International Soil Reference and Information Centre.

¹² For example, the Millennium Development Goals: Especially No.1 the eradication of extreme poverty and hunger, and No.7 environmental sustainability. See, URL: <http://www.developmentgoals.org>

¹³ The World Bank Group 2003. *Convention to Combat Desertification and Other Conventions*. URL: <http://lnweb18.worldbank.org/ESSD/ardext.nsf/17ByDocName/TowardssynergywithotherConventions>

¹⁴ “Experts need to discriminate more carefully between a naturally bad state, a temporary bad state and a degraded state of the land.” – see Mazzucato, V. & Niemeijer, D. 2001. *Overestimating land degradation, underestimating farmers in the Sahel*. Drylands Issues Paper. London: International Institute for Environment and Development, cited by UNEP 2002. *Global Environment Outlook 3*. London: Earthscan.

¹⁵ J.F. Reynolds and D.M. Stafford Smith 2002. *Global Desertification: Do humans cause deserts?* Dahlem Workshop Report 88. Dahlem University Press, Berlin.

¹⁶ Joint UNEP/IFAD Programme on *Success Stories of Land Degradation/Desertification Control*. URL: <http://www.unep.org/unep/envpolimp/techcoop/1.htm>

inappropriate land use, degradation of soil, water and vegetation cover and loss of soil and vegetative biological diversity, affecting ecosystem structure and functions – see Box 1.

5. Intensive forms of land use, including over-grazing, excessive irrigation, and intensive tillage and cropping have also been identified as causes. The *ultimate causes* or primary drivers of land degradation are policy and institutional distortions or failures in the public or government, private or market, civil or community sectors, as well as civil strife, conflict and corruption. The nature of the interrelationships and thresholds between these technical, institutional and policy factors at different levels and scales and in their temporal dimensions has not been properly addressed. Because of the complex nature of the topic itself, there tends to be a policy paralysis in how to control degradation – a situation exacerbated by uncertainty in the data and the lack of any authoritative and widely accepted assessment of the extent and causes of land degradation.

6. At global and eco-regional levels, land degradation results in the degradation and loss of unique ecosystems and their endemic components of biodiversity, and the breakdown of traditional livelihood systems and mass migrations due to recurrent droughts. It especially threatens culturally unique agro-pastoral and silvo-pastoral farming systems, and nomadic and transhumance systems. Its consequences are widespread poverty, hunger and migration, requiring increased relief aid and emergencies on an unprecedented scale and frequency, and creating a potential cycle of debt and indebtedness for the affected populations.

7. In sub-Saharan Africa, land degradation is widespread (20-50% of land) affecting some 200 million people; and this is also the region experiencing poverty and repeated natural disasters (especially drought) on a scale unparalleled elsewhere. Land degradation is also widespread and severe in Asia and Latin America as well as other regions of the globe. Climate variations, whether natural or anthropogenic in origin, aggravate the resilience of dryland ecosystems and the sustainability of livelihoods in these dryland zones. Inadequate knowledge of the nature, extent and frequency of land degradation, and the paucity of tools and methods for assessment and monitoring of this phenomenon hamper the adoption of integrated resources use and management policies and rehabilitation programs.

THE IMPORTANCE OF DRYLANDS

Biophysical Importance

8. Drylands¹⁷ provide the habitat for species uniquely adapted to variable and extreme environments. To illustrate the importance to global biodiversity, it is estimated that drylands are host to: 39 (out of 234 world-wide) centres of high plant diversity; 103 (out of 217) endemic bird areas; 1406 (out of 5495) of IUCN-Designated Protected Areas; 31 (out of 138) global terrestrial eco-regions, all of which are "outstanding examples of the world's diverse ecosystems and

¹⁷ The term 'drylands' is taken to cover hyper-arid, arid, semi-arid and sub-humid ecosystems, where the ratio of precipitation (P) to potential evapotranspiration (PET) ranges from less than 0.05 to 0.65. See: Bonkounu, E.G. no date [c.2001]. *Biodiversity in Drylands: Challenges and opportunities for conservation and sustainable use*. The Global Drylands Partnership. Gland; IUCN URL: <http://www.surf-as.org/DDC/Biodiversity-in-the-Drylands-Challenge-Paper.pdf>

priority targets for conservation actions"¹⁸. Dryland ecosystems are endowed with uniquely endemic plant and animal species associations or communities, adapted especially to harsh thermal, arid and saline conditions. The species communities exhibit adaptations such as: (a) patchy and clumped assemblages; (b) evasive behaviour; (c) unique eco-physiological structures; and (d) special trophic adaptations. Drylands are also characterised by geomorphological landscapes that include specific weathering, erosion and deposition patterns, low gradient alluvial fans, enclosed drainage systems, hyper-saline lakes, emergent artesian ground waters and particular styles of run-off and recharge and associated aquifers.

9. Dryland soils are important carbon sinks. In spite of low carbon storage on a carbon/unit area base, dryland soils have one of the greatest potentials to sequester carbon. Because of their extensive area (approximately 40% of the global land area) and the fact that many of these soils have low soil organic matter content because of past degradation, targets for carbon reduction in the atmosphere would be well addressed by soil improvement¹⁹. Furthermore, dryland soils are less likely to lose carbon because of lower rates of humification, and consequently the residence time of carbon in dryland soils is much longer than forest soils²⁰. Through degradation and rehabilitation, carbon sequestration and climate change are highly significant and sensitive to the condition ('soil health') of dryland soils

Socio-economic and Cultural Importance

10. Drylands are now inhabited by over two billion (2.038 billion) people, 37 percent of the world's total population²¹. Asia, Africa and South America have the larger population living in drylands, both in terms of numbers and percent: 1.4 billion, 268 million and 87 million people, or 42, 41 and 30 percent of each region's population respectively. The drylands are the home of the world's poorest and the world's most marginalised – economically and geographically - population. The number of poor rural people living in drylands is estimated near to one billion²². In the long history of adaptation to harsh conditions, dryland communities have gained unique knowledge in resource utilization and management. This local or indigenous knowledge is now recognised as having significant value to dryland development. Yet, there are also varying perceptions as to the importance and value of drylands – see Box 2.

11. Each biophysical entity hosts its own uniquely adapted biological communities. Indigenous human communities have traditionally used the biotic resources of these dry zones for their livelihood and have developed complex knowledge systems and management practices. Protection of these highly specialised biotic communities is important not only for learning more about their unique adaptations and trophic dynamics, but also for designing and maintaining sustainable ecosystem and resource uses, and livelihood systems under such harsh climatic regimes. Assessment of biodiversity in dryland ecosystems is generally poor, compared to that of biodiversity-rich ecosystems in the tropics. GEF already supports biodiversity conservation in

¹⁸ Robin P. White and Janet Nackoney, 2003. Drylands, people, and ecosystem goods and services: A web-based geospatial analysis. World Resource Institute. URL: http://biodiv.wri.org/pubs_description.cfm?PubID=3813

¹⁹ FAO. 2001. Soil carbon sequestration for improved land management. *World Soil Resources Reports* 96. Rome: UN Food and Agriculture Organization

²⁰ Glenn, E.P., Squires, V.R., Olsen, M and R. Frye. 1993. Potential for carbon sequestration in the drylands. *Water, Air & Soil Pollution* 70:341-55

²¹ See Footnote 13

²² Dobie, P. 2001 Poverty and Drylands. The Global Drylands Partnership, Nairobi; also quoted by Kofi Annan in the *UN Convention to Combat Desertification*.

dry areas through projects such as the project on *Biodiversity Conservation and Sustainable Livelihood Options in Grasslands*. There is a need to include key elements of biodiversity in an assessment methodology for land degradation in these dry zones.

12. Dryland ecosystems are the source of livelihood for a large number of people particularly agro-pastoralists and silvo-pastoralists, large-scale transhumance following seasonal and altitude changes, tourism and wildlife exploitation especially of some seasonally migratory large mammals, and fuelwood and natural product extraction (e.g. Gum Arabica, wild fruits and vegetables). Degradation of natural ecosystems in the face of human and livestock population growth and the environmental changes (recurrent droughts) in these regions has resulted in civil strife, repeated manifestation of poverty and hunger, and in extreme cases in starvation and mass migration; and the increased need of emergency food aid. Assessment of the socio-economic driving forces and cultural attributes and indicators linked to land degradation are well documented, but their integration into development initiatives is still very poor. This integration is crucial if there is to be success in reversing land degradation and mitigating threats of climate change and variability through promoting sustainable land use and the transfer of global benefits of capacity building to the local level where costs are incurred. There is a need to integrate the identified key elements of socio-economic and cultural linkages in a comprehensive assessment methodology for land degradation.

Box 2: Summary of Importance and Challenges of the World's Drylands

Drylands are critically important. They.....

- ✓ Occupy 47 percent of the global land area (excluding Greenland and Antarctica), including the African Sahel, Australian Outback, South American Patagonia, and North American Great Plains.
- ✓ Support over two billion people or nearly 40 percent of the world's population
- ✓ Consist of many land cover types, including shrubs, forest, cropland and urbanized areas.
- ✓ Produce forage for livestock, which in turn supports human livelihoods with meat, dairy products, and clothing materials such as wool and leather.
- ✓ Originated many staple food crops, such as wheat, barley, sorghum, and millet.
- ✓ Serve as sources of genetic plant material for developing drought-resistant crop varieties.
- ✓ Provide habitat for species uniquely adapted to variable and extreme environments.
- ✓ Store large amounts of carbon, most of it in the soil rather than in vegetation.

Yet, drylands are at the root of many misconceptions. Many see drylands as.....

- ✗ Empty, barren and unproductive places where people are unable to survive.
- ✗ Unable to support plant and animal life
- ✗ Degraded beyond restoration due to misuse and overuse from human activity.
- ✗ Always dry, with drought the main hardship to survival.
- ✗ Low priority for attention

GEF PROGRAMMING CONTEXT

13. A total of 188 countries are parties to the UN CBD, 191 to the UN CCD and 196 to the UN FCCC. The project is designed to support the objectives of all three conventions, through the sustainable use of biodiversity and land resources. Further, in structuring the project in six major world regions representing particular and specific challenges to land degradation, the up-scaling objectives of the Conventions will be met as well as the recommendation of the Second Overall Performance Review of the GEF²³.

15. *LADA* is consistent with the objective of the Convention to Combat Desertification, namely to “combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa, through effective actions at all levels, supported by international cooperation and partnership arrangements, in the framework of an integrated approach which is consistent with Agenda 21, with a view to contributing to the achievement of sustainable development in the affected areas²⁴. In addition, *LADA* addresses the guidance of the Conference of Parties (COP2) to the Convention on Biological Diversity that stressed the need “to identify the driving forces determining the status and trends of components of biological diversity”²⁵ and the COP3 asked GEF to provide financial resources for, amongst other aspects, “capacity building for initial assessment and monitoring programs....; supporting efforts for the conservation and sustainable use of biological diversity important to agriculture.”²⁶ The control of land degradation is fundamental to the conservation and sustainable use of biodiversity, especially in areas of land use such as pastoralism (arid) and in dryland agriculture (semi-arid to dry sub-humid). *LADA* supports the strategic priority on capacity building in sustainable land management (SLM-1) and its emphasis on integration of land-use planning systems, which includes strengthening of information management systems to support decision-making at the national and local levels and, dissemination and replication of good management practices, technologies and lessons learned. *LADA* will respond to these priorities by developing standardised and improved methods for dryland degradation assessment, including the assessment of drivers and impacts on dryland biodiversity as well as human wellbeing. ‘Best practice’ guidelines will be developed and the results widely disseminated.

14. The project supports GEF priorities in integrating land degradation considerations with the global conventions²⁷ and is consistent with expanded mandate of the GEF to include land degradation as a focal area.²⁸ The project also supports WSSD’s Johannesburg *Plan of Implementation*.²⁹ In the context of this project, these environment-development linkage aims

²³ GEF *Focusing on the Global Environment*; OPS2 25 January 2002: p.xiv “The GEF must place greater emphasis on the potential for replication. It should seek to create an enabling environment.”
<http://www.biodiv.org/doc/meetings/cop/cop-06/information/cop-06-inf-29-en.pdf>

²⁴ United Nations Convention to Combat Desertification. Article 2, paragraph 1.

²⁵ A Call to Action. Decisions and Ministerial Statement from the Second Meeting of the Conference of Parties to the Convention on Biological Diversity. Jakarta, Indonesia, 6-17 November 1995. Decision II/8, para 3.

²⁶ UNEP/CBD/COP/3/38, annex II, Decision III/5

²⁷ Document GEF/C.3/8, endorsed by the Council at its third meeting, outlines GEF activities that are consistent with the objective of the UN Convention to Combat Desertification, and encourages the integration of land degradation into GEF focal area activities. See ‘Strategic Considerations’ GEF *Operational Strategy* (1995)

²⁸ Beijing Declaration of the Second GEF Assembly, October 2002, paragraph 1.

http://gefweb.org/Whats_New/Beijing_Declaration_-_English.pdf

²⁹ Paragraph 41(f) of WSSD Plan of Implementation calls on GEF to take action on the recommendations of GEF Council concerning land degradation as a focal area, while Paragraphs 40 (d) and (e) call for efforts to enhance the

will be achieved through the integration of ecological, economic and social goals and through improving people's livelihoods and economic well-being by the better assessment of the environmental problems that bring about poverty and lack of investment.

IMPLEMENTING AGENCY AND EXECUTING AGENCY PROGRAMMING CONTEXTS

16. As Implementing Agency (IA), UNEP's role in GEF is detailed in the *Action Plan on Complementarity Between the Activities Undertaken by UNEP under the GEF and Its Programme of Work* (1999). This project addresses the Action Plan strategic objective of "promoting multi-country co-operation directed to achieving global environmental benefits". It will do this by establishing international co-operation mechanisms and the sharing of knowledge of good practice between countries. The project links additionally to the strategic objective of "relating national and regional priorities to global environmental objectives" by building global, regional, national and local capacity for the assessment of land degradation and its impact, and contributing to policy mechanisms for the inclusion of land degradation information at all levels.

17. The Executing Agency (EA), the FAO, has a key consultation and coordination role consistent with its contribution to the GEF. With other IAs, major environment-development initiatives and other assessment projects such as the Millennium Ecosystem Assessment (MA) and the Global Forest Resources Assessment (GFRA), FAO continues to play a central role. For example, land and agriculture were among the major topics at the Eighth Session of the Commission on Sustainable Development (CSD-8), New York, 25 April-5 May 2000. FAO played the main role in the preparation of the UN Secretary-General's reports on Chapter 10 (Integrated Planning and Management of Land Resources) and Chapter 14 (Sustainable Agriculture and Rural Development: SARD) co-ordinating inputs from many UN agencies, NGOs and various stakeholders. The report on Chapter 10 included several task manager reports, namely on Chapter 11 (Combating Deforestation) and Chapter 13 (Sustainable Mountain Development), for which FAO is also task manager, as well as on Chapter 12 (Combating Desertification and Drought), and Chapter 15 (Conservation of Biological Diversity). For the GFRA, the key characteristics included "close collaboration among international forest-related processes such as those related to criteria and indicators for sustainable forest management."³⁰ *LADA* will emulate these global assessment projects by addressing international land-related processes, especially the building of capacity to address land degradation. Furthermore, the project is consistent with the three interrelated global goals of FAO as set out in para. 20 of the Strategic Framework (2000-2015),³¹ particularly the twin objectives of sustainable production and natural resource conservation.

LINKAGES TO OTHER GEF-FUNDED PROGRAMMES AND PROJECTS

18. During the preparation phase of *LADA* there have been extensive consultations with other ongoing environmental assessments as well as other relevant GEF projects. The most important ones are listed below:

sustainable use of land and water, especially protection from loss of productivity, land degradation and salinity.

http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/POIChapter4.htm

³⁰ FAO, State of the World's Forests 2003. <http://www.fao.org/docrep/005/y7581e/y7581e04.htm>

³¹ The Strategic Framework for FAO 2000-2015, Rome. <http://www.fao.org/strategicframework/default.htm>

- Millennium Ecosystem Assessment (UNEP/GEF) – UNEP is the executing agency of MA and MA staff has participated in *LADA*'s international consultation workshops. MA has assisted *LADA* in testing the ecosystem approach for dryland degradation assessment in Argentina.
- Global International Waters Assessment (UNEP/GEF) – GIWA attended some of the early workshops to ensure synergy between the two assessments.
- International Assessment of Agricultural Science, Technology and Development (WB/GEF)
- PRC/GEF Partnership on Land Degradation in Dryland Ecosystems in China (ADB/GEF) – It has been agreed with ADB that the methodological packages for land degradation assessment to be developed by *LADA* will be scaled up in China under the partnership.
- GEF Sustainable Land Management Partnership with Cuba (UNDP/GEF) – As Cuba will be the regional node for the Caribbean component of *LADA*, there will be close linkages between the two projects.

International Strategic and Policy Context

19. In ratifying the UNCBD, the UNCCD and the UNFCCC, the countries where the main participating institutions are located recognize the threats that land degradation and its impact have on the integrity and functioning of ecosystems and land resources, particularly in drylands, and on the human development of their peoples. The aim of the UNCCD is to “target poverty, drought and food insecurity in dryland countries experiencing desertification, particularly those in Africa”.³² The aims of the UNCBD are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits.³³ *LADA* is closely linked to the UNCCD process and to integration with the other conventions, most notably UNCBD: the secretariats of both conventions have a contact group to elaborate and initiate a joint programme of work which includes assessments and targeted actions.³⁴ *LADA* will be an important activity in this co-operation between secretariats, and is already featured prominently on both websites.³⁵

20. The selection of pilot countries and the targeting of both ‘hot spots’ (severe degradation) and ‘bright spots’ (degradation largely controlled) reflect the policy concerns of international strategic initiatives, notably in the Millennium Development Goals and the New Partnership for Africa’s Development (NEPAD).³⁶ The *Environment Action Plan* of NEPAD consists of programmatic areas in combating land degradation and conserving natural resources.³⁷ The Millennium Ecosystem Assessment (MA), launched by the Secretary-General of the United Nations in June 2001 to meet the needs of decision-makers for scientific information for policy,

³² United Nations 1994. *Earth Summit: Convention on Desertification*. UN Conference on Environment and Development, Rio de Janeiro, Brazil 3-14 June 1992. Rep. DPI/SD/1576, UN, New York

³³ Article 1 *Convention on Biological Diversity* <http://www.biodiv.org/convention/articles.asp>

³⁴ UNCCD/COP5, Geneva, 2001. Review of Activities for the Promotion and Strengthening of Relationships with other Relevant Conventions, Section 2. <http://www.unccd.int/cop/officialdocs/cop5/pdf/6eng.pdf>

³⁵ For example, UNCCD, 2003, *Land Degradation Assessment in Drylands and the Millennium Ecosystem Assessment* (<http://www.unccd.int/cop/officialdocs/cop6/pdf/cst7eng.pdf>); UNCBD, 2004, *Thematic Programmes of Work: Progress Reports on Implementation and Consideration of Proposals for Future Actions: Biological Diversity of Dry and Sub-humid Lands* (<http://www.biodiv.org/doc/meetings/cop/cop-07/information/cop-07-inf-29-en.pdf>)

³⁶ *Action Plan of the Environment Initiative of NEPAD* (June 2003)

³⁷ NEPAD’s mandate on environment is co-ordinated by UNEP

has a conceptual framework where land use change and cover are one of the main drivers for ecosystem integrity. Further, the MA has established strong relationships with both the UNCCD³⁸, directly applying the work of *LADA* in its PDF-B phase, and the UNCBD, with the latter using the MA for some its assessment needs.³⁹ The International Programme for Biodiversity Science (Diversitas)⁴⁰ includes ecosystem services affected by land degradation and bio-sustainability as two of its three core projects, and has invited *LADA* scientists to contribute.

CONSEQUENCES OF CONTINUING THE BASELINE CONDITIONS

21. Without the proposed GEF intervention, the on-going confusion as to the seriousness and extent of land degradation will continue. Policy responses will remain undirected by quality assessments at global, national and local levels. Environmental issues of soil and land degradation, and their impacts on dryland ecosystems and human wellbeing, will not be integrated into key development objectives related, for example, to the Millennium Development Goals. ‘Desertification’, although widely viewed as a major environmental issue in scientific, political and even popular circles⁴¹, will remain marginalized amongst the global environmental change processes until and unless there is a widely-accepted underpinning of its role as a process by quality assessments of its extent and impact. If land degradation control is to have any realistic opportunity to become effective, assessment must be rendered more efficient, effective and reproducible. If countries are to tackle the impoverishment of their drylands, they must have the human resource capabilities and capacities of their institutions improved. Without the project, the continuing state of uncertainty over land degradation will remain, and the policy paralysis mentioned above will continue to mean that land degradation control will get sporadic, inequitable and ineffective attention.

RATIONALE AND OBJECTIVES

PRINCIPAL PROJECT OBJECTIVES

22. First, the *LADA* project will develop and implement strategies, methods and tools to assess, quantify and analyse the nature, extent, severity and impacts of land degradation on ecosystems, watersheds and river basins, and carbon storage in drylands at a range of spatial and temporal scales. The assessment will integrate biophysical factors and socio-economic driving forces. By the end of the project, *LADA* will have developed a standardised methodological framework to assess the process of dryland degradation. Guidelines for dryland degradation assessment will have been written based upon prior and project experience, and baseline degradation assessments completed. These baseline assessments will be global (largely from existing information sources) to identify priority ‘hot spots’ where the potential impacts on ecosystems is severe, national and local. These last assessments will be detailed to focus on areas of greatest risk and areas where degradation is successfully controlled. This first project

³⁸ Decision: Land Degradation Assessment in Drylands and the Millennium Ecosystem Assessment – adopted by UNCCD/COP6, Havana, August 25 - September 5, 2003. See <http://www.millenniumassessment.org/en/partners.conventions.ccd.aspx>

³⁹ UNCCD/SBSTTA Recommendation V/1 Cooperation with Other Bodies

⁴⁰ Sponsored ICSU, SCOPE, IUBS, IUMS and UNESCO – see <http://www.diversitas-international.org>

⁴¹ See Thomas, D.S.G. & N.J. Middleton 1994. *Desertification: Exploding the Myth*. Wiley, Chichester.

objective will be completed by developing appropriate monitoring systems in-country to provide warning of land degradation and its impact.

23. Second, the project will build national, regional and global assessment capacities to enable the design, planning and implementation of interventions to mitigate land degradation and establish sustainable land use and management practices. By the end of the project, capability will have been built in three main areas of land degradation assessment for drylands. All participating countries will increase their *capacity to analyse* in order to assess and understand the causes of land degradation areas at risk. They will have a better understanding of the types, extent and severity of land degradation, and the consequent changes in soils, land cover, ecosystems and agro-ecological zones as well as on the resources used for agriculture. Capacity building for analysis will also include the ability to assess processes, driving factors and causes of land degradation, to understand the impacts on ecosystem function, carbon storage, watershed integrity and international waters and to appreciate the developmental impact on food security, livelihoods and poverty. Participant countries will be enabled through following *best practices* for the identification, control and prevention of land degradation in drylands. Institutions will be facilitated and integrated in policy and decision-making. Particular emphases will be on multi-stakeholder involvement and participation, especially of land users, farmers and the rural poor at the local level and of policy-makers at national and global levels. Local professionals and extension agents will be trained in field assessment of land degradation through adopting a farmer-perspective and using a sustainable rural livelihoods approach. Best practices will also identify the synergies between different global benefits (biodiversity, climate change, international fresh water basins/river systems) and between global and local benefits (food security, livelihood support, and poverty alleviation). A further feature of *LADA* will be to adapt scientific knowledge at global, regional and national levels in order to integrate with local knowledge where local people have successfully controlled land degradation. Capacity will be built to scale-up lessons and recommendations to a wider target group and to non-project areas. Monitoring systems will be established to sustain improvements in land use and management practices. Finally, in its role in capacity building, *LADA* will *communicate and exchange* land degradation information in order to complete the linkage to policy process and decision-making. It will do this through policy guidance (in, for example, UNCCD Regional, Sub-regional and National Action Programmes), GEF and implementation agency interventions in land degradation control, and the identification of priority actions, such as policy and institutional reforms and development investments at all levels. Communication and exchange will be furthered by the implementation of best practices to identify land degradation issues and employ lessons to check and reverse problem issues and the development of monitoring on the changing severity of land degradation and effectiveness of remedial control measures.

ENVIRONMENTAL, DEVELOPMENTAL AND DOMESTIC BENEFITS

24. These objectives are expected to help to overcome current policy and institutional barriers to sustainable land use in dryland zones that are occasioned by the lack of quality information on the extent and severity of dryland degradation. Through improved decision-support, they will also assist establishment of incentives to promote the accrual of global environmental benefits at national and local levels. The attainment of the objective on tools and methods will be evident in the quality and quantity of methods guidance documents and guidelines, national dryland degradation assessments, impact assessments and global land cover

change data. Assessments independent of the project (such as GFRA, GIWA, GPA, MA and IPCC) will be especially important in verifying project attainment. Capacity-building will be verified through policy development, implementation of best practices and other methodological recommendations, the number of participatory surveys and project plans for implementation. The achievement of effective monitoring systems in place in each participating country will be especially significant.

25. The alternative scenario to be delivered by the project will be five-fold. By the end of the project, *LADA* will have in place: (a) an innovative integrated approach to land degradation assessment using high resolution remote sensing and GIS techniques, advanced models capable of integrating biophysical and socio-economic data and information, and the linkage of policy and institutional issues into the methodology; (b) a calibrated approach robust enough for inter-regional and global comparisons, as well as for national assessments and for monitoring and prediction; (c) early warning systems of land degradation trends and ‘hot spots’ together with their policy and institutional causes, so that remedial or restorative actions may be carried out promptly; (d) a network of regions⁴² and strengthened capacity to undertake land degradation assessment, interpret the results and provide information for land use; and (e) land degradation assessment information readily available and user friendly for land users and decision and policy-makers so that appropriate investments may be made for ensuring sustainable livelihoods, protecting scarce water and soil resources, sequestering carbon especially in the soil, building on the lessons from ‘bright spots’ and ‘best practices’, and conserving endemic biodiversity of global significance especially intra-specific polymorphism.

26. Additional domestic benefits will accrue from the project. Not only will scientists better relate to the development objectives of their country, but policy-makers will more readily accept scientific advice on land degradation, its impact and control measures. Better strategies, tools and methods of land degradation assessment for drylands will help to mainstream environmental information in global, regional and national development planning. They will enable a better prioritisation of the opportunities and potentials for drylands, and overcome some of the prejudice associated with these eco-regions (see Box 2).

COMPLEMENTARY INTERVENTIONS AND GLOBAL BENEFITS

27. To achieve the two objectives requires substantial country commitment and the full involvement of all the stakeholders. Multi-stakeholder participation is an essential prerequisite. The participating countries and their institutions have made the necessary commitments and will pilot the full development of the techniques and approaches of the main project as a demonstration of potential attainment of global benefits. Further, the participating countries agree to act as regional catalysts for uptake and up-scaling to other countries of their region, through workshops, dissemination of materials and leadership of regional organizations. Full global benefits will only be achieved when all countries with substantial drylands at risk from degradation not only accept the tools and methods developed by the project, but build their own capacity to analyse the causes and consequences of degradation. While working closely with the participating countries to develop quality Outcomes, the IA and EA will invite and encourage

⁴² Based initially on six focal countries in six important regions for dryland degradation, each of whom will then carry out dissemination and out-scaling to other countries in their region

the involvement of other countries. To catalyze widespread adoption of comprehensive sustainable land management that takes full account of the threats posed by land degradation will require a parallel and complementary intervention by FAO, its member countries and its partners, through regional networks (such as those existing in the Global Mechanism, the UNCCD Secretariat and NEPAD), country offices (FAO, UNEP, UNDP, World Bank) and development agencies.

RATIONALE FOR GEF FUNDING

28. Dryland ecosystems are under threat from a combination of socio-economic and biophysical changes that potentially culminate in a downward spiral of poverty leading to land degradation. The lack of reliable and comparable information on land degradation in drylands has been a major constraint to the implementation of the UNCBD and UNCCD and to the protection of international waters. The 14th GEF Council Meeting in November 1999 endorsed the advice of its Scientific and Technical Advisory Panel (STAP) and adopted an Action Plan for Enhancing GEF Support to Land Degradation.⁴³ Further, the GEF Council in May 2001 recommended that land degradation be designated a focal area of the GEF, which was reaffirmed at the December 2001 GEF Council⁴⁴. Land degradation was endorsed as a full focal area at the Second GEF Assembly in Beijing in 2002.⁴⁵ Hence *LADA* responds to the need to strengthen support to land degradation within the context of the GEF.

29. The project also responds to the needs of the joint work program between convention secretariats of the UNCBD and UNCCD on Dry and Sub-humid Lands.⁴⁶ It was fully endorsed by COP4 of the UNCCD in Bonn, Germany on 11-22 December 2000 in its Decision 18⁴⁷, which requested the involvement of the Parties so as to take full account of their concerns in project formulation and development. At the most recent COP6 in Havana, Cuba, at its 9th Plenary Meeting, 3rd September 2003, Decision 19 noted with appreciation the work to date on *LADA*, encouraged its continuation, requested the UNCCD Executive Secretary to strengthen links with *LADA*, and requested the project to take account of the needs of UNCCD national focal points.⁴⁸ Subsequent development of the full project has taken account of these requests and involved full consultation with the UNCCD Secretariat and the Global Mechanism.⁴⁹

30. The project is eligible for GEF assistance under Operational Programs that address eco-regional, biodiversity and land degradation issues. Three Operational Programs are directly relevant: OP1 (Arid and Semi-Arid Ecosystems) to target interventions to arid and semi-arid

⁴³ GEF 1999. Clarifying Linkages Between Land Degradation and the GEF Focal Areas: an action plan for enhancing GEF support. See http://www.gefweb.org/COUNCIL/GEF_C14/gef_c14_4.pdf

⁴⁴ See document GEF/C.17/5, April 5, 2001: Options for Enhancing GEF Support for the Implementation of the United Nations Convention to Combat Desertification.

⁴⁵ Proposed Amendments to the Instrument. GEF A.2/9, 31 July 2002. http://www.gefweb.org/participants/Assembly/2nd_Assembly/GEF.A.2.9_Proposed_Amendments_to_the_Instrument_ENGLISH.doc

⁴⁶ Possible elements for a joint work programme between the Secretariat of the Convention on Biological Diversity and the Secretariat of the Convention to Combat Desertification on the biological diversity of dry and sub-humid lands (UNEP/CBD/COP5/5/INF/15).

⁴⁷ UNCCD, report of COP4, <http://www.unccd.int/cop/officialdocs/cop4/pdf/11add1eng.pdf>

⁴⁸ UNCCD, report of COP6. <http://www.unccd.int/cop/officialdocs/cop6/pdf/11add1eng.pdf>

⁴⁹ See, for example, Proceedings and Outcomes of the *LADA* Steering Group, 23-25 January 2002, Rome, involving participants from UNCCD and GM, amongst 60 others. <http://www.fao.org/ag/agl/agll/lada/outcome.stm>

ecosystems; OP12 (Integrated Ecosystem Management) to catalyze widespread adoption of comprehensive ecosystem management interventions; OP15 (Sustainable Land Management) to mitigate the causes and impacts of land degradation on the structure and functional integrity of ecosystems. *LADA* will generate up-to-date ecological, social, economic and technical information, including a combination of traditional knowledge and modern science, to guide integrated and cross-sectoral management planning in drylands.

PROJECT ACTIVITIES AND EXPECTED RESULTS

31. *LADA* has four main outcomes (or planned results) that relate to its two principal objectives. Each *LADA* outcome component addresses both objective sets: (i) assessment strategies, methods, tools and their implementation; (ii) build national, regional and global assessment capacity. By embedding both objectives into each planned result, *LADA* will better meet its environmental goals of catalyzing widespread adoption of comprehensive management interventions through having both a validated system of land degradation assessment and the trained people to deliver improvements over and above the baseline condition.

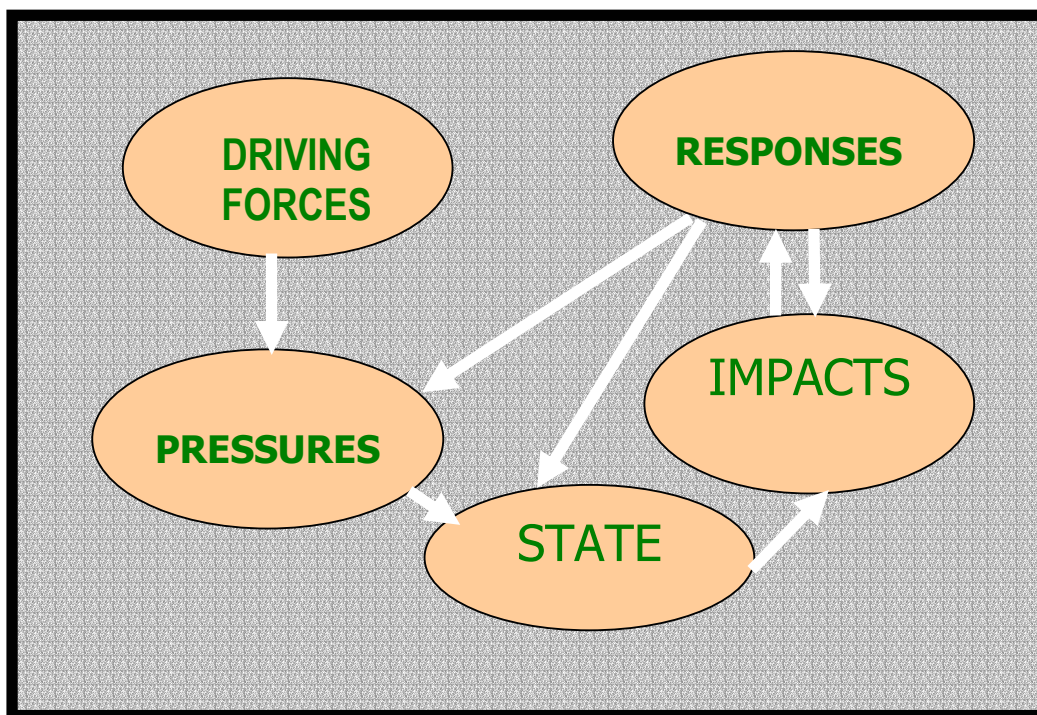
32. Land degradation assessment requires robust and verified techniques, based upon sound conceptual and integrated models that combine technical, social and economic issues. These models must respond to the needs of users and reflect the processes that drive land degradation and its impact on society. The first planned result, therefore, of *LADA* is to develop, test and disseminate an improved needs-based and process-driven approach to drylands degradation assessment. An initial step in achieving this result will be to adopt a standardised methodological and conceptual framework for the assessment of land degradation and its impact. The major change from the baseline conditions will be an applicable and relevant assessment method available to professional stakeholder groups to undertake comparable and comparative land degradation assessment that is both technically verified and socially relevant. National task forces will conduct needs assessments, which will be analysed through the DPSIR Assessment Framework – see Box 4 and Figure 3 in Annex G⁵⁰. Existing information sources will be utilised wherever possible, along with key indicators of the proximate causes of degradation. A number of proxy and new assessment sources and datasets are available, to apply at a variety of scales, including GLASOD/SOTER, GLCN/LCCS/Africover. Three key requirements will be elaborated during the work for this planned result: the methods must have diagnostic capability; they must monitor impact on human development and poverty alleviation; and they must provide the basis for an explicit link to policy and decision-making processes. The steps towards achievement of the result will be through reviews of existing work, the design of a suitable information system, its testing, and then in the six participating countries the information system will be integrated into national planning to identify critical areas. The final product will be an improved approach to dryland degradation assessment accepted by participating countries and capable of replication through regional networks. Through these steps, regional capacity will be

⁵⁰ Based on OECD 1993. *OECD core set of indicators for environmental performance reviews*. Environment Monographs No.83, Paris; Gobin, A., Govers, G., Jones, R., Kirkby, M. and Kosmas, C. 2003. *Assessment and reporting on soil erosion. Background and workshop report*. Tech. rep. 94, European Environment Agency, Copenhagen. See also, *LADA* sponsored paper – Van Lynden, G.W.J. *et al* 2004. *Guiding principles for the quantitative assessment of soil degradation*. Report AGL/MISC/36/2004, UN Food and Agriculture Organization, Rome

developed both further to develop the process-driven approach and to apply it to new situations and countries.

33. The second planned result is to present baseline ecosystem (or regional) and global assessments of land degradation for drylands. Identifying the baseline at a variety of scales is critical to measure how far remedial actions for both the processes of land degradation and its impacts have changed the degradation status. This involves collection and collation of existing maps and databases, through geo-referencing and digitising all information, inputting the natural resource and socio-economic characteristics, integrating with other databases such as GTOS, gap filling and the identification of missing data. Mapping of the baseline will be completed under this planned result at sub-regional and global levels, with an especial emphasis on areas at greatest risk. The steps towards achievement of this result are baseline data collection onto an accessible and user-friendly platform, production of baseline maps, and listing of nationally-agreed 'hot-spots' and 'bright-spots'. In undertaking this baseline compilation, project objectives will be fully supported in both the areas of tools and methods and in capacity building. The national-level skills developed here are fundamental to the achievement of the further planned results. Among the final activities under this outcome will be regional and sub-regional workshops to inform potential end-users of the scope and form of the baseline situation. Areas for more detailed assessment will also be identified against criteria for remediation priority.

Box 4: The DPSIR Land Degradation Assessment Conceptual Framework



LADA's conceptual framework is based on an original pressure-state-response model from the 1970s, subsequently adopted by the OECD in 1993 and developed further into the current model by the European Environment Agency in 2001. It captures the driving forces and pressures – largely controlled by human activity – and their effects on the environmental system and state of natural resources. For land degradation assessment, the impacts and societal responses are especially important, enabling the assessment process directly to feed into measures for control of land degradation and rehabilitation of lands

34. The third planned result is the delivery of detailed local assessments and analysis of land degradation and its impact. In order to balance the addressing of critical areas for land degradation ('hot spots') with the learning from areas that largely control land degradation ('bright spots'), local assessments will select from both situations, thereby providing a better platform for information systems linked to policy at national level. *LADA* will counter the pervasive view that land degradation is potentially and actually critical everywhere in drylands and that only imposition of externally-driven solutions can remedy the problem. To achieve balanced local assessments, training and capacity-building in detailed assessments and analysis will be undertaken along with in-country user-needs assessments. Each participating country will initiate detailed assessments for at least two sites, supported by national-level policy forums to create the linkage processes to local bye-laws, national planning and development practice. The steps towards achievement of the planned result commence with the training of relevant professionals in land degradation assessment, impact analysis and related developmental factors. Following training, the needs of users of land degradation assessment will be surveyed, along with the operation of supporting national-level integrated information systems. Pilot national assessments will then be completed and evaluated for scaling-up. Finally to achieve this planned

result, an integrated information system will be in place to provide relevant data on land degradation for policy, planning and control interventions. Policy forums at national and local level will support the process. The main performance indicator for achievement of this result will be the collation and dissemination of successful practice in policy change through institutions (including legal and incentive mechanisms) and resource allocation based upon quality land degradation assessment.

35. The final planned result is the promotion of action and decision-making for the control and prevention of land degradation in drylands using *LADA* products. This result will be driven by best practice guidelines, communication and exchange of information and uptake of approaches at all levels. To achieve this result, the steps outlined for the earlier outcomes will be followed at global, regional, national and local levels in areas defined as high priority for intervention. This includes analysis of key critical conditions for successful control and prevention of land degradation in drylands, user surveys, review of examples of ‘best practice’ and successful implementation, and the packaging, communication and exchange of land degradation information globally, regionally and nationally. The steps to attain this planned result commence with the design and demonstration of a generic framework for the analysis of critical components in land degradation. Success narratives are then analyzed and presented, which are linked to the policy process. At global level, it is anticipated that the presentation will be undertaken through an international meeting convened by the EA, IA and Convention secretariats, and attended by those involved in control, prevention and policy development for land degradation. Contributors and scientists involved in *LADA* – expected to number at least 100 from national level participating countries – will become actively involved in UNCCD, RAP, SRAP and NAP further development and support for implementation of these plans. At international level, in liaison with GEF Secretariat, *LADA* scientists will actively assist implementation of GEF-OPs. By the end of the project, international partners will be fully engaged with the *LADA* approach and at least three additional countries from the regional networks will be using *LADA* outputs. Evidence of achievement of the planned result will include the development of dissemination and up-scaling strategies, the establishment of a Web-based *LADA* portal and platform linked to FAO-UNEP sites, with all documents and advisories available on-line, an International Conference on *Land Degradation Assessment and Analysis in Drylands* and a *New Atlas of Desertification / Land Degradation* which includes a publicly-accessible account of all *LADA* outputs

36. As demonstrated in the PDF-phases of *LADA*, one of the primary attributes of the project and its partners is the delivery of outputs in accessible, usable and comprehensive form – see Annex F for a listing of major outputs published in print form, web-based and on multi-media sources. This will accelerate in the full project, backed by a full set of reports, records of meetings, scientific papers, international conference presentations and inputs to action plans at all levels. The *LADA* partners recognize that it is only through wide and full dissemination of project outputs, including success narratives and accounts of ‘best practice’, that change over and above the baseline will be initiated. The partners are well placed to meet this challenge through existing sources, such as web-based portals, and through new initiatives especially at policy level.

RISKS AND SUSTAINABILITY (INCLUDING FINANCIAL SUSTAINABILITY)

37. The sustainability of the project's outputs depends primarily on (1) the continuing commitment of the core participating countries and their institutions to engage in a unified and standardized process of land degradation assessment; (2) the access to data, surveys and remote sensing imagery by stakeholders involved in the assessment process; and (3) the free flow of information and exchange of communication between all stakeholders, but especially the lead institutions in the core participating countries and their regional collaborators for uptake and up-scaling. At Outcome and Activity levels (i.e. during the course of the project), the availability of relevant scientific and multi-disciplinary expertise at national, regional and global levels, as well as the sufficiency and comprehensiveness of existing information may prove to be a constraint. On the first, the risk of loss of commitment has been minimised through the adoption of a fully participatory approach, where institutions in the core countries have been engaged in pilot surveys and development of the methodology, as well as participants in the various PDF-B meetings. On the second, access to data has been ensured by engaging the institutions that hold the data as full participants in *LADA* and conducting preliminary analyses using their skills. On the third, it is recognized that information flows cannot always be perfected, but the core institutions have made commitments to act as catalysts for the uptake of *LADA* products, and FAO through its regional and global networks will supplement the free flow of information and communication. The risk of insufficient expertise in land degradation assessment and analysis is being addressed by Objective 2 of the project, capacity-building, where existing cadres at all levels will be supplemented especially in the areas of analysis and best practices.

38. Financial sustainability of the project will be ensured by mainstreaming of land degradation assessment approaches into integrated ecosystem planning, sustainable land management and related policy instruments at local, national, regional and global levels. With global support from FAO ensured, governments will be enabled to provide for land degradation assessment through their regular sector budgets. A further factor in the sustainability of the project is that improved land management practices arising from better assessment and analysis will be economically viable and environmentally supportive. Continued up-scaling of improved assessment techniques will be promoted by the core regional countries and their institutions.

REPLICABILITY

39. The project has two mechanisms inherent in its design to assure replication. First, the project is structured around six pilot countries and their lead institutions for conducting land degradation assessment and analysis for drylands. These countries are focal regional countries with an already-acknowledged interest and expertise in assessment processes: Argentina – for Latin America region; China – for East Asia region; Cuba – for Caribbean region; Senegal – for Francophone West Africa; South Africa – for Southern, Central and Eastern Africa region; Tunisia – for Near East, North Africa and Mediterranean region. Three – Argentina, China, Senegal - have been involved throughout the PDF phase of *LADA*, conducting pilot studies and being involved in regional and global level meetings. They fully subscribe to Outcome 4 of the Project Logical Framework (Annex B) which involves their undertaking regional promotion, training, dissemination and other collaborative ventures. This will be complemented by FAO's regional networks. South Africa has similarly been involved as an active PDF-phase participant. The other two countries have made the necessary commitments to work regionally and collaboratively.

40. Secondly, the project in its Outcome 4 will deliver ‘best practice guidelines’, including full reviews of good practice and successful implementation, and finalized best practice advice. A particular strength of the project is that best practice will not be confined to actions to rehabilitate severe land degradation; they will also stress situations where land degradation is effectively controlled, highlighting the generic conditions, socially, economically and biophysically, for this to happen. The project outcomes will, therefore, offer replication potential regionally to cover all eco-zones where there are major problems of dryland land degradation and thematically to cover a range of land uses and types of degradation. Dissemination, uptake and up-scaling are all important activity components of Outcome 4, thereby providing for replication globally.

STAKEHOLDER INVOLVEMENT

41. As a global project, *LADA* involves a large number of stakeholders at a variety of levels from the GEF itself; the UNCCD and its Global Mechanism; international scientific and consultative organizations such as UNEP, FAO, CGIAR-institutions and ISRIC; service agencies, training institutions and educational establishments; national governments, agencies and NARS. The principal partners and stakeholders in the project are the institutions of dryland countries involved in making assessments of land degradation for policy purposes and the implementation of remediation measures. These partners are supported by *LADA*'s IA (UNEP), EA (FAO) and UNCCD Secretariat, as well as a number of specialist agencies involved in assessment: at a global level these include the EROS Data Center, ISRIC (based at Wageningen University), WOCAT (based at Bern University); at a regional level, these include OSS, CGIAR centres for dryland agriculture (ICARDA and ICRISAT); and at a national level by the ministries and service/research organizations responsible for land survey and assessment.

42. Stakeholders at all levels have been invited and have attended the main *LADA* workshops held at FAO in Rome: the First Technical Advisory Group and Steering Meeting, 23-25 January 2002⁵¹; Technical Meeting, 5-8 November 2002⁵²; Second Technical Advisory Group, 24-26 May 2004.⁵³ In addition, *LADA* held a successful e-mail conference, 9 October to 4 November 2002⁵⁴ to which over 1000 experts in land degradation and desertification were invited to contribute. The 104-page *Proceedings* of this Conference not only provide a state-of-the-science review of issues related to land degradation assessment, but also demonstrate the commitment of national and international stakeholders in *LADA*. The various meetings and conferences have covered broadly four themes: (1) Methods, indicators and a conceptual framework; (2) National-level land degradation assessment; (3) Local-level land degradation assessment; and (4) Global land degradation indicators and a drylands network. The opportunity has been widely available and publicized for all interested stakeholders to join the *LADA* network.

43. Further stakeholder meetings have occurred at national level in the PDF-B pilot participating countries: Argentina, China and Senegal – see Annex F for reference details of the proceedings of these meetings. Argentina had a major workshop in 2003 involving stakeholders

⁵¹ 61 persons attended. See *Proceedings* - <ftp://ftp.fao.org/agl/agll/lada/wsr.doc>

⁵² 48 persons attended. See *Proceedings* - <ftp://ftp.fao.org/agl/agll/lada/reporttechnmeeting.doc>

⁵³ 58 persons attended. *Proceedings* First Draft, available from FAO

⁵⁴ 148 persons were active subscribers to the Conference, with 41 posting major contributions acknowledged in the *Conference Proceedings* - <ftp://ftp.fao.org/agl/agll/lada/econf.doc>

44. The project will be executed primarily by national teams of experts drawn from national research institutions, universities, government agencies and development and policy-making institutions in the participant countries. The scientists in each national team cover a range of skills and disciplines relevant to land degradation assessment, analysis and impact – see Annex E, Public Involvement Plan. At a global level, *LADA* will co-ordinate with the UNCCD framework to ensure a key support role in implementation of RAPs, SRAPs and NAPS. This will enable the action plans to have a better quantitative basis and allow calculation of resources for mobilization of land degradation control and remediation. In the pilot countries and case study countries during PDF-B, close collaboration has already been established with NARS, extension services and NGOs, as well as with environmental institutes and development agencies. Each participating country team has been free to develop these linkages and networks. In the full project, the Project Task Force will establish collaborative guidelines for national teams to ensure that policy linkages especially are fostered and made fully operational.⁶⁰

45. *LADA* aims to provide a supportive role for the implementation of the priorities of the GEF, UNCCD and UNCBD pertaining to drylands. *LADA* will contribute a methodology and conceptual framework for assessment and impact analysis at a variety of scales in order to improve the design and impact of projects addressing land degradation under OP1, 12 and 15. The project has also established initial linkages with other major regional and global initiatives, such as NEPAD, MA, MDGs and JPOI/WEHAB. These linkages will be progressively strengthened in *LADA* as the project develops its Outcome 4 products.

INCREMENTAL COSTS AND PROJECT FINANCING

INCREMENTAL COSTS

46. *LADA* will achieve global, regional, national and local benefits in the form of improved land degradation assessment strategies, methods and tools and by building capacity to analyse, design and plan the implementation of interventions to mitigate land degradation. *LADA* will provide a common framework and methodology for land degradation assessment across national, regional and international boundaries in order to identify priority areas for attention. At all scales, but especially at global and local, the assessment components of *LADA* complement the baseline activities carried out by the several agencies, governments and research/survey organizations world-wide. Global benefits will accrue to globally-significant ecosystems and hydrological basins of the drylands. At global level, the baseline includes several initiatives for satellite remote sensing of land degradation at low, medium and high resolution, particularly the global LANDSAT data set donated to UNEP by NASA.⁶¹ International institutions are not, however, actively engaged in linking knowledge of land degradation to the potential global environmental benefits that would accrue by effective land degradation control. Accordingly, *LADA* is fully complementary and the costs are eligible for GEF funding. Co-financing will support the more developmental parts of the Project Goal, such as the contributions towards improving people's livelihoods achieved through the better application of assessment and impact analysis.

⁶⁰ This is Activity 4.4 in the Project logical framework

⁶¹ See *LADA* commissioned review: Lantieri, D. 2003. Potential use of satellite remote sensing for land degradation assessment in drylands: application to the LADA project. Environment and Natural Resource Service, SDN, UN/FAO, Rome, 73pp.

47. The national and local assessment components of the project are largely complementary in all six participating countries. The type of integrated assessment developed and made available by *LADA* is not currently used because of the lack of validated methods, the unawareness of the techniques to link land degradation assessment to the structure and functional integrity of ecosystem and to developmental goals, and the unavailability of suitable data sources. Awareness of the importance of land degradation assessment at national level is evident in important baseline initiatives in, for example, the China National Water and Soil Conservation Monitoring, as well as a number of national biodiversity and development projects that contain substantial assessment and monitoring components. In *LADA*'s PDF-B phase Workshops, participating countries have noted the lack of coherence and validation in the methods being used, leading to dubious conclusions on the state of the land and the appropriate remedial measures to be adopted. At the same time, because national and local assessments are designed to catalyze regional assessments through the six focal point countries, global benefits will be obtained beyond the specific locales and nations directly involved in *LADA*.

PROJECT COMPONENT FINANCING

48. The total project cost is US\$15.18 million, of which US\$8.18 million is derived from donors and participating countries that see the value of joining a global initiative with globally-relevant outputs but also with strong application at local and national levels. The global scope of *LADA* presents methodological difficulties in assessing the baseline and incremental costs. The incremental costs analysis (see Annex A) follows the procedure used in previous global assessments supported by the GEF, such as the Global International Waters Assessment and the Millennium Ecosystem Assessment. The GEF contribution of US\$7 million amounts to less than half of the total project cost. The component financing is presented in the following two tables, according to incremental cost analytical information and to proportions requested from GEF financing and from co-financing donors.

Project Component	Baseline	Alternate	Increment
Component 1: Methodology Development	7,500,000	9,880,000	2 380 000
Component 2: Global and Regional Assessments	200,000,000	203,120,000	3 120 000
Component 3: Local and National Assessments	8,500,000	15,820,000	7 320 000
Component 4: Capacity-Building for Improved Decision-Making	1,000,000	2,540,000	1 540 000
Project Management and Administration	0	820,000	820 000
Costs	US\$217,000,000	US\$232,180,000	US\$15,180,000

49. The baseline for *LADA* consists dominantly (92%) of global and multi-national assessment initiatives in Component 2, such as remote sensing and satellite projects, UNEP's global LANDSAT data set, the pan-European Corine land cover assessment and the Africover database. There have also been some local and national assessment initiatives to contribute to the baseline for Component 3 (4% of baseline), some of them as part of much larger development projects such as the US\$76 million China-Gansu-Xinjiang Pastoral Development project and Argentina's \$36.4 million *Programa de Desarrollo Rural de las Provincias del Noroeste*. Methodology development (Component 1 – 3.5% of baseline) features in many projects at both global and national scales, but in a rather fragmented way, underlining the need for *LADA* to

extract best-practice methodological guidance while at the same time building an innovative multi-scale approach to land degradation assessment. Reports on previous and current methodologies (see Annexes F and G) stress how urgently an agreed, tested and validated methodology is needed. Component 4, capacity-building, has not featured prominently in past and current assessment projects, and hence the baseline is a relatively modest estimated US\$1 million. Global assessment initiatives have tended to be undertaken by developed country institutions with comparatively little reference to developing country partners. Local assessments have been conducted piecemeal, with little attention to building a sustainable competence in host countries. The calculations for the baseline are based upon estimated proportions of projects that have been devoted to *LADA* component themes with a particular focus on land degradation-ecosystem linkages. Annex A lists the main projects included under the baseline.

Project Component	GEF funding	Co-Financing	Total
Component 1: An Improved needs-based and process-driven approach to dryland degradation assessment developed tested and disseminated	450,000	150,000 (FAO) 250,000 (EU) 1 380 000 (Part.Ctrs) 150,000 (UNEP)	2,380,000
Component 2: Baseline ecosystem (or regional) and global assessments of land degradation for drylands undertaken and presented.	1,700,000	300,000 (FAO) 750,000 (EU) 250,000 (Italy) 120,000 (UNEP)	3,120,000
Component 3: Detailed local assessments and analysis of land degradation and its impact in areas of special risk (“hot spots”) and areas where degradation is controlled (“bright spots”) undertaken and through an information system linked to policy and national level.	3,740,000	500,000 (FAO) 100,000 (GM) 1,250,000 (Italy) 1,700,000 (Part.Ctrs)	7,320,000
Component 4: Promoting actions for decision making for the control and prevention of land degradation in drylands using <i>LADA</i> products and networks. Through the development of guidelines, communication and exchange of information and uptake of approaches at all levels	690,000	250,000 (FAO) 100,000 (GM) 100,000 (UNCCD) 350,000 (Part.Ctrs) 50 000 (UNEP)	1,540,000
Project management and administration	420,000 (6%)	400,000 (FAO)	820,000
Total	7,000,000	8,180,000	15,180,000

50. GEF funding will be 53% devoted to Component 3, local assessments, on the grounds that local assessments are the main means to derive lasting global benefits for dryland ecosystems through the identification of ‘hot spots’ for land degradation and the channelling of resources for land degradation control. As GEF-financed projects such as *PLEC* have demonstrated, areas of land use especially in dry marginal zones not only have high intrinsic and natural biodiversity but also agricultural biodiversity in terms of managed species, genotypes and varieties. If land degradation is controlled at local level in these high-risk areas, this has the primary environmental benefit of securing important global ecosystems. 24% of GEF-funding will be devoted to Component 2 for global assessments, while significantly less is allocated to the other components including management on the grounds that the activities that support these Outcomes have a stronger developmental role.

MONITORING, EVALUATION AND DISSEMINATION

(See Annex H for detailed Monitoring and Evaluation Pan.)

51. **Project execution;** the management and supervision of project activities will be monitored by the FAO *LADA* Task Force at global and generic levels, and by national Task Forces in the participating countries. Internal monitoring will aim to assist all project participants to assess their performance and impact, with the view to ensuring a directed addressing of the Projects Outcomes and Purposes.

52. **Project performance:** internal evaluation by the Task Force, Steering Committee and Scientific Committee will assess the delivery of Logframe Outcomes. Annual internal evaluation will be mobilised by the Project Manager and Project co-ordinator in liaison with the IA, utilising members external to FAO of the project's advisory committees. Annual financial audits will be carried out by the IA in collaboration with the Task Forces at global and national levels. An external mid-term evaluation will be conducted, as well as a final evaluation, which will be undertaken by consultants commissioned by the IA. These evaluations will be informed by annual technical audits that will provide the basis of evidence for evaluation.

53. **Impact evaluation:** one of the primary purposes of *LADA* is to engage with policy at all levels and to change the way that land degradation assessments are used to guide implementation of sustainable land management. It is, therefore, proposed that the Scientific Committee will commission impact studies at national and global levels to investigate the degree to which *LADA* products and information are being used and integrated in decision-making processes. Key indicators will be: (1) the range of stakeholder involvement; (2) the uptake of *LADA* products, processes and procedures; and (3) the introduction into policy and practice of land degradation assessment and analysis. Ultimately, impact evaluation will seek to assess the degree to which processes such as soil erosion and vegetation destruction of drylands have been controlled through a better engagement with the base of information provided by *LADA*. It is acknowledged that this impact may well only become effective well after the project life-time.

FINANCIAL MODALITY AND COST EFFECTIVENESS

54. Co-financing has been secured from a number of sources, including international donors, the governments of participating institutions, on-going projects requiring land degradation assessment, and other donors.

55. The baseline for the project is substantial because of the large resources already devoted to soil and water conservation, control of desertification, management of drylands, protection of biodiversity and other actions related to land degradation on areas of land use. In the six countries constituting the regional nodes, baseline efforts are estimated at substantially in excess of US\$200 million. The investments are, however, unevenly distributed between countries and within countries. In Africa particularly, baseline efforts have not been so substantial. Nevertheless, the large size of the baseline means that GEF financing will be most cost effective, both generically and globally as well as nationally. Not only will demands for *LADA* products be great but also the co-ordination, continuation and sustainability of *LADA* guidelines and processes be assured. The GEF funding is acting as a regional catalyst through the six regional node countries, which will ensure up-take to nearby countries and promotion of the integration of sustainable land management practices into management plans from the local to the sub-

regional level. The UNCCD process of NAPs, RAPs and SRAPs will be employed to make up-scaling effective and efficient.

LIST OF ANNEXES

ANNEX A.	INCREMENTAL COST
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ANNEX D.	INDICATIVE PROJECT WORKPLAN This Annex shows in 6-monthly increments the phasing and completion of proposed Activities to achieve the Project Outcomes
ANNEX E.	PUBLIC INVOLVEMENT PLAN The Annex provides a description of all identified Stakeholders in <i>LADA</i> to date from: <ul style="list-style-type: none">- executing agencies and advisory committees- country executing teams- identified in-country expertise in different disciplines- capacities of participating scientists- NGOs, national government agencies, local government- Stakeholder support via endorsement of involvement- Linkages with other projects
ANNEX F.	AVAILABLE REFERENCE DOCUMENTS AND OUTPUTS FROM PDF-B The Annex lists the documents. Websites and other media outputs from the PDF-B phase, all of which will be used as a platform for the full project.
ANNEX G.	SUMMARY OF PROGRESS ON <i>LADA</i> GUIDELINES, METHODOLOGY DEVELOPMENT, CASE STUDIES & GLOBAL ASSESSMENT <i>LADA</i> made considerable progress during the PDF-B stage toward guidelines, methodology development, case studies in pilot countries, and the development of a global assessment process. The Annex summarises progress and sets out the next steps for achievement in the full project
ANNEX H.	MONITORING AND EVALUATION PLAN This Annex describes the basis for evaluation of <i>LADA</i> , lists the indicators of project performance and tabulates the reporting formats, content and responsibility.

ANNEX A. INCREMENTAL COST

BROAD DEVELOPMENT GOALS

LADA will generate global, regional, national and local benefits. Global benefits will accrue to globally-significant ecosystems and hydrological basins. However, *LADA* has equally important developmental goals, which, taken from the relevant GEF Operational Programs, are to:

- sustainably use the biological resources of arid and semi-arid areas [OP1]
- integrate ecological, economic and social goals to achieve multiple and cross-cutting local, national and global benefits [OP12], and
- contribute to improving people's livelihoods and economic well-being [OP15].

The developmental goal of *LADA* may therefore be summarised as to improve the utilisation of biological and land resources for the benefit of both environmental sustainability and the well-being of the people who rely upon drylands for their livelihoods. The more specific developmental objective of the project is to provide the assessment strategies, tools and methods to undertake better identification of land degradation problems and impacts, and then to build the capacity to replicate these assessments to mitigate land degradation on a regional scale and establish sustainable land use and management practices. Countries and regions that engage fully with the *LADA* process should gain economically and socially through the protection of their biodiversity and land resources. The global community and its institutions will also be better equipped to allocate resources to critical areas of land degradation ('hot spots') and to learn from the lessons of areas where land degradation is effectively controlled ('bright spots').

BASELINE SCENARIO

Two factors make the baseline scenario of *LADA* somewhat problematic to calculate. First, as with other global assessments such as the MA, the global scope of the project presents methodological difficulties for the baseline costs, which are normally calculated in a national context. Therefore, the baseline (and incremental) cost analysis follows the procedures used in previous global assessments supported by the GEF such as GIWA and MA. Global assessments of specific processes in land degradation, such as soil erosion, have been attempted and continue to be undertaken, but in a somewhat haphazard and inconsistent way. These are factored into the largest component of the baseline, which represents US\$200 million, or 92% of the total project baseline.

Secondly, there are a large number of projects that could have been included in the baseline on the grounds that they have some relevance to *LADA*'s global and local activities. These could have included the early soil degradation assessments conducted by FAO in the 1970s and published as the *Provisional Methodology for Soil Degradation Assessment*, along with mapping for North Africa and the near East at a scale of 1:5

million. Although that initiative had fundamental methodological flaws, *LADA* will build on some of the methodological experience gained then and in subsequent global and multi-national assessments such as GLASOD and ASSOD.⁶² In addition, there are many projects at national level that have assessment components, although the main thrust of the project is developmental. *LADA* has drawn on some of these contributions to method and the validation of their utility in real cases. However, as evidenced by their number, these and many other projects have largely failed to grasp the challenge of producing consistent and replicable methods that could be used for land degradation assessment and the analysis of its impact. Therefore, a fairly conservative estimate of the contribution of other projects has been retained for the baseline scenario.⁶³

The baseline for the four components of *LADA* has therefore been constructed from an analysis of the more recent (past and current) influential projects and the proportions of their budgets that could be described as contributing to *LADA* objectives. The matrix presented at the end of this Annex summarises the basis of the calculations of baseline for each Component. Major past and current projects on which the global, national and capacity-building components of *LADA* are dependent are listed below.

INTERNATIONAL AND GLOBAL (COMPONENT 2 PLUS PARTS OF 1 AND 4)

The following international projects contribute proportionately to the relevant component baselines and are also included in the International Associated Financing total at Section 3 of front end of the Brief:

Global International Waters Assessment: US\$13 million
Global Biodiversity Assessment: US\$3 million
Global Forest Resources Assessment (FAO, 1992-1999): US\$16.5 million
World Overview of Conservation Approaches and Technologies (WOCAT): US\$2.25 million
The Millennium Ecosystem Assessment (UNEP): US\$20 million
Global Terrestrial Observation System (GTOS): US\$520,000 (over 5 years)
Global Land Cover Network: US\$1.174 million
Terrestrial Ecosystems Monitoring Sites (TEMS): US\$200,000 (over 5 years)
Asiacover (FAO): US\$360,000
Soils and Terrain Database (SOTER – ISRIC-FAO): US\$100,000
(Remote sensing and satellite imagery projects (e.g. SPOT, NOAA, etc.): US\$700 million)⁶⁴
UNEP's global LANDSAT data set: US\$21 million
Other projects (e.g. IAASTD, Network Survey, UNEP data sets etc.): estimated US\$17.5 million

Total Associated International projects: US\$ 95.6 million

NATIONAL AND LOCAL (COMPONENT 3 PLUS PARTS OF 1 AND 4)

⁶² See the *LADA*-commissioned report: Van Lynden, G.W.J. and Kuhlmann, T. 2002. *Review of Degradation Assessment Methods*. Wageningen: ISRIC, 52pp.

⁶³ The Millennium Ecosystem Assessment GEF Project Brief estimates that if all relevant initiatives were to be included for global assessments, a conservative estimate is that some US\$3 billion is spent annually on research or assessment work related to ecosystems. The same estimate could be put forward for land degradation, but is not considered appropriate or useful in this incremental costs analysis.

⁶⁴ This figure is not included in associated financing.

The following national level projects contribute proportionately to the relevant component baselines and are included in the National Associated Financing total at Section 3 of the front end of the Brief.

China National Water and Soil Conservation Monitoring: US\$1.2 million

China Gansu-Xinjiang Pastoral Development Project: US\$76.7 million

The PRC-ADB-GEF Partnership on Land Degradation in Dryland Ecosystems US\$15 million

Projet de Gestion Intégrée des Ecosystèmes du Sénégal (PGIES) : US\$7.919

Projet de Gestion Durable et participative des Energies traditionnelles et de Substitution (PROGEDE-Senegal) :US\$19.9 million

Projet Biodiversité Sénégal-Mauritanie : US\$12.760 million

Projet de Gestion des Ressources en Eau et de l'Environnement de la Vallée du Fleuve Sénégal : US\$7.625 million

Programme de Conservation des Eaux et des Sols dans les Gouvernorats de Kairouan, Siliana et Zaghouan. – Tunisia : US\$12.34 million

South Africa part of Desert Margins Programme (DMP): US\$ 1.607 million

ECI project: Land Degradation in the Karoo, South Africa: US\$ 40 000

Programa Nacional de Bosques Modelo- Argentina: US\$727 000

Programa de Desarrollo Rural de las Provincias del Noreste (PRODERNEA) US\$36.4 million

Total Associated National projects: US\$192.218 million

BASELINE BY PROJECT COMPONENT

Component 1: An improved needs-based and process-driven approach to dryland degradation assessment.

A substantial body of past and current research underpins existing approaches and methods for land degradation assessment. However, they all have limitations that make them unable to be employed directly for *LADA*. They utilise a range of techniques such as Expert Opinion, Remote Sensing, Field Monitoring, Productivity Changes, Land Users' Opinion and Modelling, but with little cognisance of the fact that the specific technique itself can be influential in determining the result of the assessment. This applies especially to scale-dependency issues, where results from one scale cannot simply be scaled-up to larger areas without consideration of the processes of land degradation. They tend only to focus on one specific type of degradation, in particular soil erosion and soil salinity, and therefore cannot be applied more broadly to land degradation. With the exception of employing "Land Users Opinion" and "Productivity Changes", they have a biophysical bias and are inherently weak with regard to assessing socio-economic impacts as well as impacts on ecosystems and the global environment. Moreover, none of the existing land degradation assessment methodologies have an explicit focus on drylands. Methods and approaches commonly employed and which have been reviewed in the *LADA* PDF-B phase include GLASOD, WOCAT, ASSOD, SOVEUR, SLM-IM, USLE, SLEMSA, EPIC, WEPP, EUROSEM, NUTMON and national assessments. The applicable baseline for these and other methods and approaches initiatives has been conservatively estimated at a minimum of US\$ 7.5 million. If the full historical cost of the projects that have been reviewed for this Component were to have been used, then the baseline could have been at least ten times more.

Component 2: Baseline ecosystem (regional) and global assessment of land degradation for drylands undertaken and presented.

This component focuses on regional and global assessments, and the baseline largely is comprised of the many remote sensing and satellite techniques and their prodigious outputs. A large number of remote sensing sensors are available today, including:

- low and medium resolution civilian optical satellites (e.g. NOAA, SPOT 4&5, MODIS);
- high resolution civilian optical data (e.g. LANDSAT, SPOT, LISS, IRSSS);
- very high resolution civilian optical data (e.g. KFA 1000, IKONOS, Quirkbird, HRS/SPOT);
- space-born radar data.

In addition, each sub-region of the world's drylands is well covered by specialised institutions that have a fairly well developed capacity for using remote sensing in a land degradation assessment. The regional node countries of *LADA* have been selected on this basis and they will use the capacity developed with these techniques and outputs to build a more consistent regional and global assessment. Assessments of land cover (e.g. Africover, Corine Land Cover) have been undertaken for specific regions and countries, but land cover has not been appropriately linked to land degradation or health of dryland ecosystems. Moreover, due to the lack of a standardised methodology, many of these assessments are not comparable and replicable and can not be used to develop a global overview of land degradation in drylands. If the baseline were to include the cost of satellites and related infrastructure, as well as the maintenance of all past and new ground stations and processing facilities, then several billion dollars would have to be included under this component. Therefore, only the parts of projects most relevant to this *LADA* project component have been factored into baseline cost, which is conservatively estimated at US\$200 million.

Component 3: Detailed local assessments and analysis of land degradation and its impacts in areas of special risk and areas where degradation is controlled undertaken and information system linked to policy at national level

Existing work on biodiversity indicators for drylands (e.g. by the OECD) exhibits constraints in terms of indicators and monitoring methods and needs to be related to land use pressures and scale of analysis. This can be attributed to: a) scientific uncertainty and poor understanding of ecosystem processes and functions and the complexity of ecological systems; b) the wide range of policy-relevant issues that fall under the umbrella of biological diversity and of land degradation; c) the substantial variation in environmental and land use conditions among the different dryland ecosystems, coupled with high local heterogeneity; and d) the breadth of biodiversity and degradation attributes and the inherent risk of an over-complex, time consuming and costly assessment process. Local and national level assessments are not using a standardised approach to dryland degradation assessment and are not adequately linked with policy and decision-making processes. The baseline cost has been assessed from current and immediate-past projects that have used land degradation assessment as part of their work programmes, the information for which has been provided by the six focal participating countries. Cost: US\$ 8.5 million

Component 4: Promoting actions for decision making for the control and prevention of land degradation in drylands using *LADA* products and networks through the development of guidelines, communication and exchange of information and uptake of approaches at all levels.

Existing regional centres with environmental assessment capacity play a role in disseminating environmental information and assessments through their networks. Their work has, however, been hampered because of the lack of accurate information on the status of the world's drylands. There are no co-ordinated efforts to develop guidelines for identification of root causes and impacts of dryland degradation and to improve linkages to decision-making processes. There are relatively underdeveloped links between the work of these centres and the policy process at global, regional and national levels. The baseline is an estimate of the current costs of the work of action promotion for land degradation and related environmental issues by existing regional centres. Cost: US\$ 1 million.

GLOBAL ENVIRONMENTAL OBJECTIVE

The global environmental objective of *LADA* is the conservation and sustainable use of the essential and globally-important ecosystems and land resources in the world's drylands, consisting of all arid and semi-arid areas. This objective strongly and fundamentally crosscuts the catalyzation of adoption of comprehensive ecosystem management interventions, through the better application of land degradation information. It also crosscuts the mitigation of the causes and negative impacts of land degradation on the structure and functional integrity of ecosystems. The mutually supportive global environmental objectives of the project are an essential feature, on the grounds that dryland ecosystems cannot be protected without attention to ecosystem function and land degradation control. For areas of land use, the entry point has to be attention to land degradation, and without knowledge on the extent and impact of land degradation, biodiversity could not be protected.

DOMESTIC ENVIRONMENTAL OBJECTIVES

Countries participating in *LADA* and undertaking national and local assessments will be better placed to address domestic environmental issues. They will be able to prioritise interventions to protect ecosystems and utilise the value of dryland species under threat. Subsistence agriculturists and pastoralist people are dependent on dryland biodiversity for their livelihoods, and dependent on the inherent quality of their soil and land resources. National institutions will be able better to support soil and water conservation services and agricultural extension with quality information on the threat posed by land degradation. They will be able to address issues of poverty of marginalised people's who mainly inhabit drylands and be able to provide services that support their livelihoods. Poverty and environmental degradation are now well-recognised as linked elements in drylands. The entry point for addressing environmental degradation locally has often been found to be attention to issues such as access to markets, better utilisation of 'social capital' and the provision of support services.

GEF ALTERNATIVE

Under the GEF alternative, the project will provide for substantially increased capability to protect the ecosystems of the world's drylands. This in turn provides for further global benefits in management of ecosystem services and the control of land degradation through more sustainable land management. The activities of the project will predominantly provide for global environmental benefits, but with some important national environmental and developmental benefits accrued.

GEF ALTERNATIVE BY PROJECT COMPONENT

Component 1: An improved needs-based and process-driven approach to dryland degradation assessment.

The project will develop an integrated assessment methodology for drylands that generates new and reliable data on drylands. *LADA's* approach will build and further develop existing methods, drawing lessons from past projects that were reviewed during the PDF-B phase of the project. It will utilise wherever possible existing sources of information, but build these into a new framework approach that meets GEF requirements for global environmental benefits. The new approach will not only encompass the extent and severity of land degradation, but will also assess its impact on the environment, especially ecosystems, and on people and their livelihoods. It will include factors in the socio-economic impact of land degradation and the drivers, and it will assess the impact of dryland degradation on globally significant ecosystems.

Component 2: Baseline ecosystem (regional) and global assessment of land degradation for drylands undertaken and presented.

One of the principal outputs of *LADA* will be the development of a standardised global assessment of land degradation in drylands, which includes the impacts on ecosystems and livelihoods that enables cross-regional comparisons. This has not been undertaken before and will have major benefits for the worldview of the extent of land degradation and consequent threats to the loss of biodiversity, but will also relate these to important developmental objectives for poor people and threatened livelihoods.

Component 3: Detailed local assessments and analysis of land degradation and its impacts in areas of special risk and areas where degradation is controlled undertaken and information system linked to policy at national level.

Linkage of global with local impacts on globally-important threats to the environment is a principal feature of *LADA*. The project will build on the many local assessments that have been undertaken for various (mainly developmental) purposes, and will add information that will address global environmental issues. At the level of detailed assessments and analysis of land degradation, biodiversity indicators can be easily integrated into the *LADA* approach. Biodiversity, land degradation and social and economic conditions are inextricably linked. Thus, assessment of all of these dimensions will occur concurrently and at the same sites so that cause-effect relationships can be identified. This approach will build a clearer picture of the impacts and linkages between socio-economic driving forces, pressures on natural resources and the resulting

improving or declining state of those resources and sustainable livelihoods. It will also provide clearer direction for changes to natural resource management at local and agro-ecological level and for revised or new policy at national level.

Component 4: Promoting actions for decision making for the control and prevention of land degradation in drylands using *LADA* products and networks through the development of guidelines, communication and exchange of information and uptake of approaches at all levels.

A need for better support for decision-making on the control and prevention of land degradation has been clearly articulated by the various concerned agencies and national and international levels. The project will provide for enhanced capacity for informed decision-making related to dryland management through the involvement of all stakeholders and through the better provision of information that will not only be accurate but also be designed for policy and decision-making.

COSTS AND INCREMENTAL COST MATRIX

The baseline and incremental costs of the proposed project are summarized in the following incremental cost matrix. The total incremental cost of the project, US\$15.18 million, is required to achieve the project's global environmental objectives. Of this amount US\$7 million is requested for GEF support with the remainder coming from other donors.

INCREMENTAL COST MATRIX

Project Component	Baseline	Alternative (Baseline +Increment)	Increment
Component 1: An improved needs-based and process-driven approach to dryland degradation assessment	Baseline approaches and methods derive from a large number of research and survey projects commissioned in the past, some of which continue under development. These include GLASOD, WOCAT, ASSOD, SOVEUR, SLM-IM, USLE, SLEMSA, EPIC, WEPP, EUROSEM, NUTMON and national assessments. They are limited in their application to <i>LADA</i> on grounds of information methodology, narrow range of biophysical process, lack of attention to socio-economic factors, inapplicability to ecosystem and global impacts, and lack of focus on drylands. Cost: minimum US\$ 7.500 million	Development of an integrated assessment methodology for drylands that generates new and reliable data on drylands and that factors in socio-economic impacts and drivers and assesses the impact of dryland degradation on globally significant ecosystems Cost: US\$ 9.880 million	Methodology for land degradation assessment in drylands Cost: GEF: \$ 450,000 Other: \$\$1,930,000 Total: US\$ 2.38 million
Component 2: Baseline ecosystem (regional) and global assessment of land degradation for drylands undertaken and presented	A large number of remote sensing sensors are available today, including low, medium, high and very high resolution civilian optical satellites and spaceborn radar. Dryland regions are well covered by specialised institutions with the capacity and experience to use these techniques. However, many of the assessments already undertaken at this scale are not comparable and replicable and can not be used to develop a global overview of land degradation in drylands. Cost: minimum US\$200 million	Development of standardised global assessment of land degradation in drylands and impacts on ecosystems and livelihoods that enables cross-regional comparisons. Cost: US\$203.120 million	Global overview of the extent of land degradation in drylands and global overview of dryland ecosystems threatened by land degradation. Cost: GEF: US\$1,700,000 Other: US\$1,420,000 Total: US\$3.120 million
Component 3: Detailed local assessments and analysis of land degradation and its impacts in areas of special risk and areas where degradation is controlled undertaken and information system linked to policy at national level	Existing local and national level assessments are large in number. They form a baseline for <i>LADA</i> in knowledge, experience and needs-based criteria. However, they are not using a standardised approach to dryland degradation assessment and are not adequately linked with policy and decision-making processes. Cost: US\$ 8.500 million	Indicators of biodiversity, land degradation and social and economic conditions are linked and will be used. Assessment of all these will occur concurrently and at the same sites so that cause-effect relationships can be identified. A clearer direction will be provided for changes to natural resource management at national level and for revised or new policy. Cost: US\$15.820 million	At least one national assessment completed in each of the six sub-regions and “bright spots” and “hot spots” and underlying drivers of change identified. Cost: GEF: US\$3,740,000 Others: US\$3,580,000 Total: US\$7.320 million

<p>Component 4: Promoting actions for decision making for the control and prevention of land degradation in drylands using <i>LADA</i> products and networks through the development of guidelines, communication and exchange of information and uptake of approaches at all levels</p>	<p>Existing regional centres with environmental assessment capacity currently play a role in disseminating environmental information and assessments through their networks. However, they lack accurate information on the status of the world's drylands, and efforts are uncoordinated. Efforts to develop guidelines for identification of root causes and impacts of dryland degradation and to improve linkages to decision-making processes. are presently lacking. Cost: US\$ 1 million</p>	<p>Enhanced capacity for informed decision-making related to dryland management. Cost: US\$2.540 million</p>	<p>Guidelines for identification of root causes and impacts of dryland degradation on ecosystems and improved linkages to decision-making processes. Cost: GEF: US\$690,000 Others: US\$850,000 Total: US\$1.540 million</p>
<p>Project Management and Administration</p>	<p>No suitable management structure for such a project currently exists Cost: 0</p>	<p>Project management and co-ordination Cost: US\$820,000</p>	<p>Cost: GEF: US\$420,000 Others: US\$400,000 Total: US\$820,000</p>
<p>TOTAL COST:</p>	<p>Baseline: US\$217.00 million</p>	<p>Alternative: US\$232.18 million</p>	<p>Incremental Cost: GEF: US\$7.000 million Others: US\$ 8.180 million Total: US\$15.180 million</p>

ANNEX B: PROJECT LOGICAL FRAMEWORK

PROJECT TITLE: Land Degradation Assessment in Drylands (LADA)			
INTERVENTION LOGIC	INDICATORS OF PERFORMANCE	SOURCES OF VERIFICATION	ASSUMPTIONS AND RISKS
OVERALL GOAL			
<p>ENVIRONMENTAL: To conserve the biological resources of arid and semi-arid areas [OP1]</p> <p>To catalyze widespread adoption of comprehensive ecosystem management interventions [OP12]</p> <p>To mitigate the causes and negative impacts of land degradation on the structure and functional integrity of ecosystems [OP15]</p> <p>DEVELOPMENTAL: To sustainably use the biological resources of arid and semi-arid areas [OP1]</p> <p>To integrate ecological, economic, and social goals to achieve multiple and crosscutting local, national, and global benefits.[OP12]</p> <p>To contribute to improving people's livelihoods and economic well-being. [OP15]</p>	<ul style="list-style-type: none"> Globally important biodiversity is conserved and sustainably used, as indicated by measuring key indicators of ecosystem structure and function; to include surveys of dryland vegetation cover, indicators of ambient threats such as soil erosion and its underlying causes. [OP1 Expected Outcomes] Appropriate policies, regulations, incentive structures, are developed to support integrated ecosystem management The capacity of institutions strengthened to implement integrated ecosystem management approaches Investments are made simultaneously to address local, national, and global environmental issues within the context of sustainable development [OP 12 Expected Outcomes] Institutional and human resource capacity strengthened to improve sustainable land management planning and implementation Policy, regulatory and economic incentive framework strengthened to facilitate wider adoption of sustainable land management practices across sectors Improvement in the economic productivity of land under sustainable management [OP15 Expected Outcomes] <p>plus specific to drylands and LADA's wider developmental contribution:</p> <ul style="list-style-type: none"> Increase investment opportunities and effectiveness in drylands management Develop the knowledge base for drylands management and increase the human resource capacity to tackle land degradation Overcome current policy and institutional barriers to sustainable land use Establish incentives to promote the accrual of global biodiversity benefits through sustainable land management in drylands at national and local levels Integrate livelihood and poverty considerations into sustainable land management planning for drylands 	<ul style="list-style-type: none"> Biodiversity surveys and conservation plans Sustainable development surveys and reviews National economic surveys and plans GEF Operational Program reviews National institutional policy and practice National legislation 	<p>Continuing work by IAs to assist countries to analyze the causes of biodiversity loss at ecosystem level [OP1 assumption]</p> <p>Strong country commitment to address land degradation within the context of sustainable development and poverty alleviation priorities [OP15]</p> <p>GEF implementing and executing agencies mainstream sustainable land management into their regular programs and activities</p> <p>[plus other risks identified in OP1, 12 & 15 Program Assumptions]</p>

PROJECT OBJECTIVES			
<p>1. [Assessment Strategies, Methods, Tools and Their Implementation] Develop and implement strategies, tools and methods to assess, quantify and analyse the nature, extent, severity and impacts of land degradation on ecosystems, watersheds and river basins, and carbon storage in drylands at a range of spatial and temporal scales</p>	<p>By the end of the project, strategies, methods and tools of assessment developed and implemented, as follows:</p> <ul style="list-style-type: none"> • Standardised methodological framework for the <i>process</i> of dryland degradation assessment developed and accepted by ALL participating national groups* • Guidelines for dryland degradation assessment developed and in use in ALL participating countries* • Baseline dryland degradation assessments completed at a scale no smaller than 1:1 million in ALL participating countries* • Global assessment of actual dryland degradation completed mainly through proxy assessments, the drivers identified and key ‘hot-spots’ located where potential impact on ecosystems, watersheds, river basins and carbon storage is severe • Detailed assessments and analysis of land degradation, focusing on areas of greatest risk and areas where degradation has been successfully controlled, completed in ALL participating countries* • Monitoring systems in place to provide warning of land degradation and its impact in ALL participating countries* 	<ul style="list-style-type: none"> • Project reports • Published methods and guidelines papers • National dryland degradation assessments • National impact assessment reports • Priority area reports • Global land cover change assessments • Other assessment (eg. GFRA, GIWA, GPA, MA, IPCC) 	<ul style="list-style-type: none"> • Country commitment • Access to data, surveys and remote sensing imagery unrestricted • Involvement of local stakeholders and communities for detailed assessment unrestricted
<p>2. [Capacity building] Build national, regional and global assessment capacities to enable the analysis, design, planning and implementation of interventions to mitigate land degradation and establish sustainable land use and management practices</p>	<p>By end of the project, capability and capacity built at all levels in:</p> <ul style="list-style-type: none"> • Analysis to assess and understand the causes of land degradation areas at risk in ALL participating countries* in terms of: <ul style="list-style-type: none"> i. Types of dryland land degradation ii. Extent and severity of land degradation (changes in soils , land cover , ecosystems, and agro-ecological zones) on the resources used for agriculture (cropping; livestock) and for conservation of biodiversity iii. Biophysical and socio-economic processes, driving factors and causes iv. Impacts on environment (ecosystem function, carbon storage, watershed integrity, international waters etc) v. Developmental impact (food security, livelihoods, poverty etc.) • Best practices for the identification, control and prevention of land degradation in drylands in ALL participating countries* and institutions facilitated and integrated in policy and decision-making, through: <ul style="list-style-type: none"> i. Multi-stakeholder involvement and participation, especially of land users, farmers and the rural poor at the local level and of policy-makers at national and global levels ii. Inclusion of local professionals and extension agents in field assessment of land degradation through adopting a farmer-perspective and using a sustainable rural livelihoods approach 	<ul style="list-style-type: none"> • National environmental, ecological, soils and land survey reports • National, regional and global institutional policies • Best practice guidelines and implementation plans • Technical manuals and guidance notes • Participatory surveys • Implementation project plans • Monitoring system plans and operations 	<ul style="list-style-type: none"> • Participating countries and institutions continue to accept project goal to mitigate the causes and negative impacts of land degradation • Institutional co-operation and willingness to develop policy for sustainable land management • Communication and exchange of information unhindered

	<ul style="list-style-type: none"> iii. Identification of synergies between different global benefits (biodiversity, climate change, international fresh water basins / river systems etc.) and between global and local benefits (food security, livelihood support, poverty alleviation etc.) iv. Adoption and adaptation of scientific knowledge at global, regional and national levels and its integration with local knowledge where local people have successfully controlled land degradation v. Building into implementation project design a capacity for policy guidance and for scaling-up lessons and recommendations to a wider target group and non-project areas vi. Establishment of monitoring systems to sustain improvements in land use and management practices <ul style="list-style-type: none"> • Communication and exchange of land degradation information, and its linkage to policy process and decision-making, through: <ul style="list-style-type: none"> i. Policy guidance (in, for example, UNCCD Regional, Sub-regional and National Action Programmes) ii. GEF and implementation agency interventions in land degradation control iii. Identification of priority actions, such as policy and institutional reforms and development investments at all levels iv. Implementation of best practices to identify land degradation issues and employ lessons to check and reverse problem issues v. Development of communication provisions for monitoring at all levels the effectiveness of land degradation and remedial control measures <p>[* ‘ALL participating countries’ refers to countries executing the project and to areas identified as ‘hot spots’; but in the longer term also to all signatory countries of the UNCCD with drylands degradation, and which accept the approaches and techniques developed by the project]</p>		
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OUTCOMES AND ACTIVITIES			
N.B. All 4 Outcomes and Activity sets integrate the two Objectives – (1) Assessment Strategies, Methods, Tools and Their Implementation; and (2) Capacity building			
INTERVENTION LOGIC	STEPS AND CRITICAL CONDITIONS	SOURCES OF VERIFICATION	ASSUMPTIONS AND RISKS
OUTCOME 1 An improved needs-based and process-driven approach to dryland degradation assessment	A standardised methodological and conceptual framework developed for the assessment of land degradation and its impact, that has the following essential features: <ul style="list-style-type: none"> ⇒ Starts with a needs assessment by national task force ⇒ Assessment and analysis then based on the DPSIR Assessment Framework ⇒ Scientifically valid using participatory processes 	<ul style="list-style-type: none"> • FAO-UNEP-GEF reports and manuals • Conference papers 	<ul style="list-style-type: none"> • Availability of relevant scientific and multi-disciplinary expertise at national, regional and

developed, tested and disseminated	<ul style="list-style-type: none"> ⇒ Allows for data replication and use of existing information ⇒ Identifies key indicators of the causes of degradation ⇒ User-friendly at national and local level ⇒ Multi-level linked assessments from the field scale to national and regional ⇒ Proxy assessments, using new GLASOD/SOTER, GLCN/LCCS/AFRICOVER and other relevant sources and datasets ⇒ Suitable for national monitoring systems for land degradation ⇒ Capable of giving warning of critical ecosystem functions ⇒ Has diagnostic capabilities ⇒ Monitors impact on human development and poverty alleviation ⇒ Linkage to policy and decision-making processes over allocation of resources and mobilisation of remedial action 	<p>to major forums such as GEF Assembly, COP/UNCCD</p> <ul style="list-style-type: none"> • Scientific papers in relevant journals and international media • Local media reports 	global levels
PROJECT COMPONENTS	INDICATORS OF PERFORMANCE [& MILESTONES]		
<p>Activity 1.1: Review of data sources, methods and frameworks for land degradation assessment for drylands at multiple scales</p> <p>[this activity brings together the PDF-B outputs in order to construct a process for designing and implementing land degradation assessment at national level].</p>	<p>By month 6, reviews of existing work completed and lessons drawn:</p> <ul style="list-style-type: none"> • Assemble previous reviews (e.g. from PDF-B stage); field testing indicators report; pilot country stocktaking reports • Review progress of <i>LADA</i> Special Studies (from PDF-B) for global level pilot testing • Integrate lessons and main recommendations with PDF-B e-mail conference and preparatory report (FAO-WSR #100) suggestions • Develop criteria for best practice according to scale of analysis, purpose of assessment and global-local linkage objectives • Review and revise 7-steps <i>LADA</i> Methodological guideline • Develop DPSIR (Driving Forces-Pressures-State-Impacts-Responses) Framework • Recommend best practice in standardised methodologies 	<ul style="list-style-type: none"> • Review documents on data sources, methods and frameworks • New <i>LADA</i> brochure for main project, jointly with FAO, UNCCD, GEF and UNEP 	<ul style="list-style-type: none"> • Existing information sufficient and comprehensive enough upon which to build recommendations
<p>Activity 1.2: Development of integrated information systems at national level for data storage, retrieval, handling and use</p>	<p>By month 12, an information system designed and tested:</p> <ul style="list-style-type: none"> • Analysis of <i>LADA</i> needs and criteria for information system design and functions • Review of existing databases at global and regional levels (GLASOD/SOTER, Africover, GFRA, WOCAT etc.) • Elaborate information system interrogation criteria to extract datasets required for DPSIR Framework. Include synergy criteria for other GEF focal areas. • Develop prototype information system and database using existing facilities and access, with negotiated adaptations for <i>LADA</i> needs • Pilot testing at different scales, including role in monitoring • Evaluation of pilot testing 	<ul style="list-style-type: none"> • <i>LADA</i> information system needs review • Prototype information system 	<ul style="list-style-type: none"> • Availability of relevant scientific and multi-disciplinary expertise at national, regional and global levels • Existing information sufficient
<p>Activity 1.3: Implementation and testing of integrated information system for land</p>	<p>Starting in month 7 and continuing to month 24, in the three pilot participating countries, information system is integrated into national planning and used to identify critical areas:</p>	<ul style="list-style-type: none"> • Prototype 	<ul style="list-style-type: none"> • Availability of relevant

degradation assessment and analysis	<ul style="list-style-type: none"> • prototype information system introduced, evaluated and adapted for national conditions, resources and existing information sources and networks (eg. AEIN) • Essential features [participation, diagnostic capability etc.] reviewed by national task forces, and plans made for their explicit inclusion • Performance of information system evaluated against all other existing land degradation assessments at local to national levels • Global level assessments used to identify preliminary list of critical areas 	<p>information system</p> <ul style="list-style-type: none"> • Project reports • National task force reports • Preliminary lists of critical areas 	<p>scientific and multi-disciplinary expertise</p> <ul style="list-style-type: none"> • Continued support for national task forces
<i>Activity 1.4:</i> Development and dissemination of guidelines for an improved needs-based and process-driven approach to dryland degradation assessment for different target audiences	<p>By month 18 an improved needs-based and process-driven approach to dryland degradation assessment accepted by participating countries</p> <ul style="list-style-type: none"> • Develop criteria for best practice according to scale of analysis, assessment of needs and global priority objectives, including synergies with other GEF focal areas. Consider cost implications in terms of benefits to be derived. • Recommend best practice in the application of a standardised methodological and conceptual framework • Case study report (from Activity 1.3) on information system performance for dissemination • Regional and sub-regional workshops for dissemination and discussion of recommendations 	<ul style="list-style-type: none"> • Best practice guidelines • Case study reports • Regional and national workshop reports • Brochures, CD-ROMS 	<ul style="list-style-type: none"> • Willingness of partners, non-participating countries and other networks to co-operate

INTERVENTION LOGIC	STEPS AND CRITICAL CONDITIONS	SOURCES OF VERIFICATION	ASSUMPTIONS AND RISKS
<p>OUTCOME 2 Baseline ecosystem (or regional) and global assessments of land degradation for drylands undertaken and presented</p>	<ul style="list-style-type: none"> • Collection and collation of existing maps and databases, involving: <ul style="list-style-type: none"> ⇒ Geo-referencing and digitising of all information on integrated database ⇒ Inclusion of natural resource conditions and socio-economic characteristics ⇒ Inclusion of GLASOD/SOTER and GTOS databases, Africover/FAO-UNEP GLCN, GFRA ⇒ Filtering and testing of existing data-sets and databases ⇒ Gap-filling and missing data identified ⇒ Cost-benefit and scientific criteria for any new surveys for baseline assessments. ⇒ Limited critical new surveys commissioned from project partners ⇒ Assessments integrated into database ⇒ Mapping at sub-regional level • Global assessments conducted, using at least the following: <ul style="list-style-type: none"> ⇒ UNEP's global LANDSAT dataset for changes in land cover ⇒ WCMC input on areas of high conservation value ⇒ Identification of areas at greatest risk ⇒ Sample mapping at global level 	<ul style="list-style-type: none"> • Integrated database • FAO-UNEP-GEF regional and global assessments • Millennium Ecosystem Assessment reports • Conference papers to major regional and international forums • Scientific papers in relevant journals and international media 	<ul style="list-style-type: none"> • Availability of relevant scientific and multi-disciplinary expertise at national, regional and global levels
PROJECT COMPONENTS	INDICATORS OF PERFORMANCE [& MILESTONES]		

<p>Activity 2.1: Collation, geo-referencing and digitising all available relevant information on regional and global scales</p>	<p>By month 30, baseline data collated and accessible on a user-friendly platform</p> <ul style="list-style-type: none"> • Assemble databases and ensure free access through stakeholder partnerships • Identify gaps and missing information essential to carry out project objectives • Digitise information at the relevant scale • Produce preliminary baseline maps • Evaluation criteria developed to include at least the following: <ul style="list-style-type: none"> - Scientific quality - Cost-efficiency and financial viability for extending - Field level testing and validation • End-user (e.g. national institutions; key national experts) comments and suggestions • Quality and utility of the information evaluated 	<ul style="list-style-type: none"> • Stakeholder workshop reports • Information database • Preliminary mapping • Project reports • FAO Bulletins and miscellaneous technical reports 	<ul style="list-style-type: none"> • Free access to all available relevant information • Willingness of partners to share information
<p>Activity 2.2: Baseline maps at global and regional scale no smaller than 1:1 million constructed</p>	<p>Starting in month 19 and continuing to month 42, baseline maps produced and widely available for eco-regions and areas represented by participating countries</p> <ul style="list-style-type: none"> • Using Outputs of Activities 1.4 and 2.1, scoping study undertaken in each participating country in order to: <ul style="list-style-type: none"> - Choose appropriate mapping scales - Identify particular dryland degradation issues requiring prominence - Quantify resources required to complete baseline maps • Global (whole country) baseline map constructed – either in-country or through provision of data to specialised mapping agency • Ecosystem (or regional) baseline maps constructed using in-country facilities 	<ul style="list-style-type: none"> • National scoping studies • Extracts of global baseline maps • Ecosystem (or regional) baseline maps 	<ul style="list-style-type: none"> • Resources to undertake baseline mapping available in-country and allocated to task
<p>Activity 2.3: Areas at greatest risk of dryland degradation identified and categorised</p>	<ul style="list-style-type: none"> • By month 42, nationally-agreed lists of ‘hot-spots’ and ‘bright-spots’ identified, described and widely-available • Global and ecosystem assessments reviewed to identify preliminary lists of: <ul style="list-style-type: none"> ⇒ Areas at greatest risk – ‘hot spots’ ⇒ Areas where land degradation is successfully controlled – ‘bright spots’ • Regional ‘expert workshops’ convened to identify the nature of dryland degradation and root causes of processes and impacts • Areas for detailed assessment described and chosen 	<ul style="list-style-type: none"> • Project reports • Workshop reports • FAO Bulletin on areas at risk 	<ul style="list-style-type: none"> • All relevant institutions continue to agree to be part of land degradation assessment process • Involved professionals agree to balance negative and positive situations

INTERVENTION LOGIC	STEPS AND CRITICAL CONDITIONS	SOURCES OF VERIFICATION	ASSUMPTIONS AND RISKS
<p>OUTCOME 3 Detailed local assessments and analysis of land degradation and its impact in areas of especial environmental and socio-economic risk ('hot spots') and areas where degradation is controlled ('bright spots') undertaken and, through an information system, linked to policy at national level</p>	<ul style="list-style-type: none"> • Training and capacity-building in detailed assessments and analysis, involving: <ul style="list-style-type: none"> • Building national assessment and analytical research capacity in NARS • User needs assessments and stakeholder involvement • Field methods and farmer-perspective assessments • Inclusion of local and indigenous knowledge • In-country user needs assessments, including: <ul style="list-style-type: none"> • Involvement of all stakeholders, especially local land users • Collation of existing data and gap analysis • Collection of missing data and complementary information • From Activity 2.3 initiate detailed assessments for at least TWO sites in each participating country, to include: <ul style="list-style-type: none"> • Areas at greatest risk but with some potential for control and rehabilitation • Areas where degradation is controlled and land users' livelihoods are assured • Policy-forums convened in each participating country to examine linkages to: <ul style="list-style-type: none"> • Local bye-laws; District planning and execution of devolved responsibilities for renewable natural resources • National economic, regional and conservation planning • Development planning and practice of national-level institutions • Development of alternative policy instruments and incentive mechanisms 	<ul style="list-style-type: none"> • Training materials • Cadre of local professionals trained in land degradation assessment techniques • Detailed assessment reports • Policy forums • National plans • Laws and regulations 	<ul style="list-style-type: none"> • Availability of suitable local professionals for training and capacity building • Enabling environment created by national institutions • Policy-makers at all levels able and willing to enter dialogue on land degradation
<p>PROJECT COMPONENTS</p>	<p>INDICATORS OF PERFORMANCE [& MILESTONES]</p>		
<p><i>Activity 3.1:</i> National-level and local professionals develop the capacity to undertake detailed assessments of land degradation, related to key developmental questions such as livelihoods, poverty and food security</p>	<p>Starting in month 7 and completed by month 18, all relevant professionals trained in land degradation assessment, impact analysis and related developmental factors.</p> <ul style="list-style-type: none"> • In-country or internationally-provided training courses organised (at sub-regional levels) in detailed assessment of land degradation and its impact, involving: <ul style="list-style-type: none"> • Staff from research, development, NGOs, local extension and district level • Key specific skills for the institutional environment, such as prior training and knowledge base • Field sites chosen for training with respect to lists developed in Activity 2.3: <ul style="list-style-type: none"> • At least one site where dryland degradation is causing substantial threats to both global concerns (biodiversity; climate change) and to local developmental concern; but that demonstrated potential exists to control degradation once assessment and analysis is completed • At least one site where local and indigenous knowledge is strong and seen to be successful in controlling land degradation and mitigating impacts • Key developmental issues determined from relevant planning documents: <ul style="list-style-type: none"> • Local and national planning consultation and workshops 	<ul style="list-style-type: none"> • Training course reports and evaluations • Reports from NARS 	<ul style="list-style-type: none"> • Co-operation of relevant institutions • Willingness of national and local professional staff to develop new skills

<p>Activity 3.2: User needs and information system needs assessments undertaken at national level</p>	<p>By month 18, the needs of users of land degradation assessment and the operation of national-level integrated information system [Activity 1.2] understood in all participating countries</p> <ul style="list-style-type: none"> • Trained staff undertake a user needs assessment for each site for detailed local land degradation assessment, taking into account: <ul style="list-style-type: none"> • Local and indigenous knowledge held • The development needs of local people • The needs of local professionals to undertake land degradation control • National priorities • Global environmental obligations • Relevant institutions decide on the siting and organization for a suitable information system to provide policy-relevant data to national planners 	<ul style="list-style-type: none"> • User needs assessments • Information system plans 	<ul style="list-style-type: none"> • Trained staff released to undertake user needs and information needs assessments • Institutions can agree on information system and allocate resources accordingly
<p>Activity 3.3: Pilot detailed assessments undertaken in ‘hot spot’ and ‘bright spot’ areas; and recommendations developed for scaling-up the findings to national level</p>	<p>Starting by month 19 and completed by month 42, pilot national assessments completed and evaluated for scaling-up</p> <ul style="list-style-type: none"> • Following training and needs assessments, trained staff undertake full assessments and analysis • Assessments reported, along with recommendations for further action in immediate areas of assessment • Scaling-up analysis undertaken at national level 	<ul style="list-style-type: none"> • Land degradation assessment reports • Scaling-up reports 	<ul style="list-style-type: none"> • Trained staff released to undertake detailed assessments
<p>Activity 3.4: National and local level policy processes for renewable natural resources information investigated, suitable entry points for land degradation information determined, and information system made operational for national and district level planning and practice</p>	<p>By month 42, an integrated information system [Activity 1.2] is in place in each participating country providing relevant data on land degradation for policy, planning and control interventions</p> <ul style="list-style-type: none"> • Policy forums established at: <ul style="list-style-type: none"> National level within appropriate agency (e.g. planning or environment ministry) Local level with district executive • Policy analysis undertaken of: <ul style="list-style-type: none"> Existing provisions to promote control of land degradation New provisions and potential avenues for their insertion into policy Through established policy forums: • Develop at national level, the mechanisms for undertaking detailed land degradation assessments, linked to national development and environment goals • Work with district executives, how land degradation information for critical areas should be handled • Collect and disseminate examples of successful practice in policy change, policy instruments and incentive mechanisms <ul style="list-style-type: none"> • Institutional provisions • Laws, regulations, incentives for land degradation control • Required resources 	<ul style="list-style-type: none"> • Project reports • Policy analysis • Minutes of policy forums and meetings 	<ul style="list-style-type: none"> • Enabling environment created by national institutions sufficient to support policy forums and analysis

INTERVENTION LOGIC	STEPS AND CRITICAL CONDITIONS	SOURCES OF VERIFICATION	ASSUMPTIONS AND RISKS
<p>OUTCOME 4 Promoting action and decision-making for the control and prevention of land degradation in drylands using LADA products and networks, through the development of best practice guidelines, communication and exchange of information and uptake of approaches at all levels</p>	<ul style="list-style-type: none"> • Analysis of key critical conditions for successful control and prevention of land degradation in drylands, involving at least the following: <ul style="list-style-type: none"> • Review of project activities at all levels • Feedback and evaluation from national and international partners • The integration of critical components of local and adapted knowledge • User surveys at a sample of sites and institutions to assess best practices needs and the integration of the recommendations of <i>LADA</i> into plans and practices, involving at least ONE of the following: <ul style="list-style-type: none"> • Global/multilateral development institution • International conservation NGO • International professional organisation (such as UNEP, DDC/UNDO, IFAD) • Bilateral aid donor • National economic development planning agency • Line ministry specialist offices at local/district level • District executive office • Resource user • Review of examples of ‘good practice’ and successful implementation, involving: <ul style="list-style-type: none"> • Success narratives from literature or other sources • Project’s own experience from monitoring systems • Application of project’s own criteria for measuring success • Development of finalised ‘best practice’ advice in: <ul style="list-style-type: none"> • Standardised methods and guidelines for land degradation assessment • Monitoring systems for land degradation control • Detailed surveys for planning and development purposes • Identification of high risk areas and the use of success narratives to draw lessons on policy and practice • In parallel in Year 4 of the project, the packaging, communication and exchange of land degradation information globally, regionally and nationally, through: <ul style="list-style-type: none"> • Policy Guidance, based on ‘best practice’ identified from Activity 3.3 • Policy development and technical reforms through UNCCD COPs and Regional, Sub-regional and National Action Programmes • GEF interventions in integrated ecosystem management (OP12 support), sustainable land resource management (OP15) in arid and semi-arid areas (OP1) • Priority Actions, including policy and institutional reform, and development investments • ‘Best Practice’ in areas where land degradation has been effectively controlled • Monitoring tools for use at all levels 	<ul style="list-style-type: none"> • Review document on critical conditions for dryland degradation control • Reports of user surveys • Case study review of examples of ‘good practice’ • ‘Best practices’ review publication • Policy guidance documents • UNCCD COPs and Action Programmes • GEF reviews and guidance documents • Full range of technical and advisory documents from <i>LADA</i> 	<ul style="list-style-type: none"> • Sufficient agreement exists between partners to harmonise ‘best practices’ • National experts continue to appreciate the role of critical components (such as local knowledge) and to integrate them into their planning and processes

PROJECT COMPONENTS	INDICATORS OF PERFORMANCE [& MILESTONES]		
<p>Activity 4.1: Critical component framework developed for effective land degradation control at multiple scales and levels</p>	<p>By month 30, a generic framework for the analysis of critical components in land degradation designed and demonstrated.</p> <ul style="list-style-type: none"> • Identify from previous activities, the critical components arising from land degradation assessment methods that contribute to successful implementation of land degradation control, to include: <ul style="list-style-type: none"> • Incorporation of indigenous and traditional technical knowledge • Synergies with other global environmental change focal areas • Institutional strengths of partners and agencies • Participation of all stakeholders • Develop a framework of critical components for the design of national land degradation control plans for the different scales of analysis • comprehensive inclusion of results to date • Utility of framework demonstrated in participating countries at: <ul style="list-style-type: none"> • Local level through involvement of land users, local professionals, district staff and development agents • National and regional level planning forums, including the UNCCD RAPs, SRAPs and NAPs • Global and multilateral aid assistance level in, for example, additional funding for land degradation control, global benefit assessments, and other supports for <i>LADA</i> objectives 	<ul style="list-style-type: none"> • Framework for national land degradation control plans • National reports on <i>LADA</i> activities • Synthesis report on requirements for ‘best practices’ implementation 	<ul style="list-style-type: none"> • Partners and co-operating institutions willing and able to agree comprehensive framework • Local, national and international findings sufficiently consistent to develop clear recommendations in the framework
<p>Activity 4.2: Collation and synthesis of success narratives of land degradation control and prevention</p>	<p>By month 36, success narratives analyzed and presented.</p> <ul style="list-style-type: none"> • ‘Best practice’ lessons derived from multiple sources: <ul style="list-style-type: none"> • FAO, UNEP, UNDP, World Bank • National reports and interviews with key staff • Literature survey • E-mail platform, mini-conference • <i>LADA</i> project experience and brainstorming exercise of involved scientists • WOCAT and other network experience • Reporting of findings on ingredients of success in successful implementation of land degradation control projects 	<ul style="list-style-type: none"> • Book or major report published 	<ul style="list-style-type: none"> • Willing co-operation of all partners and multiple sources with success narratives

<p>Activity 4.3: <i>LADA</i> hosts a high-level international meeting convened through the auspices of FAO, UNEP and UNCCD of institutions involved in land degradation information, control, prevention and policy development</p>	<p>In month 37 <i>LADA</i> contributes to policy guidance at international, regional and national levels</p> <ul style="list-style-type: none"> • Agenda includes: <ul style="list-style-type: none"> • Co-ordination efforts and responsibilities in land degradation assessment and analysis at international, regional and national levels • Professional and funding responsibilities in land degradation in drylands • Existing policies and their development • Desired documentary and other assistance needed for policy formulation • Preparations made to deliver the recommendations of the international meeting through following Activities 	<ul style="list-style-type: none"> • Proceedings of international meeting • Supporting documentation on assistance for policy formulation 	<ul style="list-style-type: none"> • Willingness of high-level partners and other key players in land degradation to be involved in policy guidance
<p>Activity 4.4: <i>LADA</i> involved with other stakeholders in assisting policy development with UNCCD through COPs, RAPs, SRAPs and NAPs at national and regional levels</p>	<p>By month 42, <i>LADA</i> scientists actively involved in UNCCD RAP, SRAP and NAP further development and implementation support</p> <ul style="list-style-type: none"> • Using guidance on ‘best practices’, policy implications are developed that consider: <ul style="list-style-type: none"> • Laws, regulations incentive structures • Financial and human resource demands • Priority setting (e.g. concentrate on ‘high risk’ areas) • Funding sources • Complementarities with Millennium Development Goals (MDGs), JPOI/WEHAB and other global focal areas • Policy recommendations discussed and assisted through existing policy development forums at national and regional level • Consideration of appropriate policy medium • Support mechanisms for policy implementation • Funding issues 	<ul style="list-style-type: none"> • Project reports • UNCCD work plans • RAPs, SRAPs and NAPs 	<ul style="list-style-type: none"> • Willingness of UNCCD secretariat to continue involvement • National partners amenable to project involvement in policy development
<p>Activity 4.5: <i>LADA</i> works with UNEP and GEF Secretariat to develop support advice for implementation of OP15</p>	<p>By month 45 <i>LADA</i> scientists actively assisting implementation of GEF OPs</p> <ul style="list-style-type: none"> • Meeting with GEF Secretariat staff to identify <i>LADA</i> outputs and plan policy development and associated documents with the view to: <ul style="list-style-type: none"> • Supporting implementation of OP15 with cross-cutting relevance to OP1 and 12 • Developing assessment methodologies that address synergies with other global focal areas and development goals • Contribution of <i>LADA</i> to other major regional and global initiatives (e.g. NEPAD; MA; MDG, JPOI/WEHAB) • Incremental cost calculations related to land degradation • <i>LADA</i> staff and UNEP plan strategy for output and impact of <i>LADA</i> methods and guidelines 	<ul style="list-style-type: none"> • Project reports • Minutes of meetings • Planning and strategy documents 	<ul style="list-style-type: none"> • OP15 is the main programme to make land degradation issues operational; and OP15 still commands GEF Council enthusiastic support and funding
<p>Activity 4.6: Final packaging, communication and exchange of land degradation information globally, regionally and nationally</p>	<p>By end of project, international partners fully engaged with <i>LADA</i> approach and at least three additional countries using <i>LADA</i> outputs</p> <ul style="list-style-type: none"> • Dissemination and up-scaling strategy developed, through <ul style="list-style-type: none"> • Dialogue with partners • Comprehensive database of persons and institutions involved in land 	<ul style="list-style-type: none"> • Dissemination and up-scaling strategy document • FAO-UNEP web portal 	<ul style="list-style-type: none"> • Willingness of partners and other key players in land degradation to be involved in packaging, communication and

	<p>degradation assessment, control and prevention</p> <ul style="list-style-type: none"> • Newsletters and information sheets: including guidance notes and technical documents • Web-based <i>LADA</i> portal and platform established and linked to FAO-UNEP sites, with all documents and advisories available on-line, including <ul style="list-style-type: none"> • Project progress reports • Technical reports on methods and monitoring systems • Case study reports, especially of successful control practices • Advisory notes on integrated assessment • Examples of policy formulation and institutional structures • Books, scientific papers and pamphlets • International Conference on <i>Land Degradation Assessment and Analysis in Drylands</i>, to be linked into existing and new networks with a particular focus on the use of land degradation information for sustainable natural resource management • New <i>Atlas of Desertification / Land Degradation</i> which includes a publicly-accessible account of all <i>LADA</i> outputs - success stories, maps, guidelines, manuals, scientific papers, environmental/ecological survey reports, CD-ROMs, web sites 	<ul style="list-style-type: none"> • Conference proceedings • UNCCD Network Survey web site database 	<p>exchange of land degradation information</p>
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ANNEX C: STAP ROSTER TECHNICAL REVIEW

STAP TECHNICAL REVIEW

LAND DEGRADATION ASSESSMENT IN DRYLANDS (*LADA*)

William Critchley
Vrije Universiteit Amsterdam

05 August 2004

1. PREAMBLE

This review follows the agreed terms of reference (TOR) relating to the STAP review of the above project brief⁶⁵: ‘Land Degradation Assessment in Drylands’ hereafter referred to as ‘*LADA*’ or ‘the project’. The six ‘key issues’ are covered as well as the six ‘secondary issues’. There is also a brief general introduction, and a concluding section with ‘miscellaneous points’ that do not fit conveniently under the main headings. It must be pointed out that various tables/annexes belonging to the proposal detailing costs, incremental costs, co- and associated finances as well as Annex E (Public Involvement Plan) were not available or apparently completed at the time of the review. While this has little effect on the current exercise (which is technical in nature), it will obviously slow down the process of submission of the proposal to the GEF-SEC.

2. GENERAL COMMENTS

The *LADA* project brief comprises a comprehensive and clearly written document. It evidently stems from considerable intellectual and scientific input, and builds up a convincing case for standardisation of land degradation assessment. It is commendable that *LADA* also seeks to highlight positive experience with mitigation of land degradation. This reviewer strongly supports the principles involved, and the urgency of carrying out such an exercise, for the reasons argued in the document: land degradation is a pernicious environmental problem which is prevalent in the drylands, has an intimate relationship with poverty and yet is poorly understood and inadequately addressed.

The brief closely follows a GEF path, covering all the main issues of relevance to a project to be funded under OP 1 (though it might perhaps have been equally at home under OP 15 – Sustainable Land Management). Nevertheless strong cross-cutting linkages are drawn, both with OP 15 and OP 12. Comparing the brief with the checklist of ‘common mistakes’ in the UNEP-GEF Operational Manual, there are no evident errors to be found. There can be no doubt of *LADA*’s potential global environmental significance (in terms of biodiversity, carbon storage, ecosystem function and more). There is a good combination of institutional, technical and strategic purposes.

⁶⁵ ‘brief’ = proposal in UNEP-GEF terminology and the two words are used interchangeably here

3. KEY ISSUES

3a Scientific and Technical Soundness

The scientific rationale for this project is compelling and is convincingly spelt out: the document provides excellent supporting references and valuable footnotes. It has been well researched. Land degradation is a major threat to the global environment, and is virulent in the drylands where its interlinkage with poverty (both a cause and a consequence; thus a vicious cycle) is a major challenge. Yet the definitions of land degradation, the quantification of its impacts and causal factors range widely from country to country, and organisation to organisation, because of the lack of a standard approach. This has directly led to confusion, some cynicism and has partially been responsible for a paralysis of action. If we don't know how bad the problem is, and what the measurable benefits are, then why invest? And where and in what to invest? That has dogged dryland development programmes for decades.

The key to the *LADA* project is that it promises to deliver a scientifically based consensus on how to assess land degradation, and intends to merge diverse and conflicting systems into one. This is urgent. Even more important – and perhaps not adequately stressed in this brief, though implicit – is the fact that consensus should have the effect of re-focussing international attention on the problem, through helping to eliminate scepticism arising from the current widely varying estimates noted in the proposal⁶⁶. The profile of land degradation will be raised. The brief's logical framework offers a useful split between 'environment' and 'development' - for clarity, not divisiveness – and this highlights the positive and direct developmental consequences of what might be construed at first to be mainly an environmental problem. Thus the project looks at 'hot spots' of land degradation and 'bright spots' of mitigation. Despite the confusing imagery this makes for a balanced approach.

3b Global Environmental Benefits

There is absolutely no question that land degradation – and its antithesis, mitigation or effective land management – is at the heart of ecosystem function with its direct impact on biodiversity and carbon storage⁶⁷. It both impacts on climate change (through loss of carbon storage) and is affected by climate change in multiple ways. It would difficult to identify another environmental problem with so many linkages. There are close interactions with poverty. While 'the drylands' are generally considered marginal (literally and metaphorically), the project document points out their importance in terms of extent (47% of the globe's surface⁶⁸) population (37% of the world's population⁶⁹) and biodiversity. With the drylands particularly prone to land degradation, or 'desertification' (for example 20-50% of land in Sub-Saharan Africa) and relatively starved of investment, this is a well worthwhile initiative in terms of global environmental benefits.

3c GEF, OP and CBD, CCD Goals

The brief makes a very strong case for the project's position, fairly and squarely at the centre of various international environmental and development goals. Through assessment of land degradation in its broadest sense comes an understanding of causes and impacts, and

⁶⁶ Para 3 of the brief tells us "Answers [to the questions at the core of the debate] range from the modestly optimistic to the wildly pessimistic"

⁶⁷ It is a relief to see the term 'carbon storage' used in place of the more common 'carbon sequestration' thus dispensing with jargon and making the concept clearer to non-specialists.

⁶⁸ 47% is the figure given in para 3. Soon afterwards para 9 quotes a figure of "approximately 40% of global land area" and Annex G "29% of global land area": consistency is required– or an explanation of why they differ

⁶⁹ 37% is the figure given in para 10; 30.5% in Annex G – see comment in footnote 4

environmental implications. Through identification and promotion of best practice comes development benefits to help guide (amongst others) the UNCCD's National Action Programmes (NAPs). The logframe usefully differentiates not just between environmental and development goals and indicators, but also separates out those related to OP 1, to OP 12 and to OP 15. There is also frequent and adequate mention given to the links to the goals of the UNCCD – with its associated NAPs, and the UNCBD – where the brief sets out clearly the extent and significance of biodiversity in the drylands⁷⁰. Land degradation in the drylands is a direct threat to quantity and diversity of biological organisms, and conservation of land restores the potential for that biodiversity to flourish, ecosystems to be restored, more carbon to be stored in the land (below and above ground) and poverty to be reduced. There can be no doubt that *LADA* addresses these goals.

3d Global and Regional Context

A focus on six countries (with initially three 'pilot' countries amongst these: though it is not clear which those are until paragraph 42) is sensible. It could be argued that the choice be better explained with respect to the assumption that results will be "upscaled to countries within their regional remit" and (footnote 40) "each of these countries will carry out dissemination and outscaling to other countries within their region". To what extent are these countries really 'representative' of their regions? Why is the Indian subcontinent omitted? While recognising the difficulty in choosing six willing partners to 'represent the rest' it would be valuable to justify the selection more clearly.

Care will also be needed in reconciling national steps and approaches (eg results of 'needs assessments') with a standard international methodology: is there room for national interpretation of standards? Related to this there is an apparent contradiction, which should be explained, between the emphasis on standardisation (which is stressed throughout) and the mention, most notably in Annex G, of 'participatory methodologies', involving land users. The latter would tend to lead to location specific concepts and ideas: how will these two be reconciled?

The final point here is the footnote in the logframe under 'objectives' explaining the use of the term "ALL participating countries". This states that "in the longer term [*LADA* will expand beyond the six executing countries to] "all signatory countries of the UNCCD with dryland degradation which accept the approaches and technologies developed by the project". It is rather strange to draw attention here to countries in the post-project phase, when within the project there are three (unnamed) extra participating countries mentioned in the logframe (against activity 4.6) which are *not* mentioned here specifically.

3e Replicability of the Project

The rationale for the six countries (mentioned above) is that they will act as nuclei from which the methodology and approach of *LADA* will spread. Three will act as pilot countries, expanding to the six and a further three (unspecified) by the end of the project. Then guidelines will be produced to spread the message of land degradation assessment and mitigation further. The effectiveness of this will be dependent on the whole *LADA* approach being institutionalised within the FAO, UNEP-GEF, the GM, CGIAR Centres, ISRIC etc and various other international and national partners and carried forward as part of regular programmes (see sustainability).

⁷⁰ It would be useful to mention an important and closely related UNEP-GEF MSP in this context: 'Promoting best practices for conservation and sustainable use of biodiversity of global significance in arid and semi-arid zones' (GF/1300-99-03)

An outside observer of the *LADA* project might rightly ask: *why the just the drylands?* The obvious retort is that this is where poverty is concentrated, this is where the problem of land degradation has been largely underfunded, and it is where the confusion between terminology⁷¹ - as well as the fluxes and extent of land degradation - is the greatest. Climate change is likely to have the greatest impact in these climatic zones. Finally the UNCCD has been dogged by these uncertainties. Nevertheless, if a methodology of assessing land degradation is relevant to the drylands, surely this methodology will also be valid for the more humid zones where land degradation is also a crucial issue – especially on densely populated steep tropical hillsides? Perhaps there is mention of this somewhere in the brief? But if so it certainly is not prominent: it should be discussed.

3f Sustainability

LADA is termed a ‘project’ of 4 years duration: from January 2005 until December 2008. The timeframe for the completion of this ambitious project is extremely optimistic⁷². Are all the stakeholders convinced that it is possible? Has the necessary commitment been expressed? Presumably so – but this perhaps should be noted in the text. *LADA* is intended to be a catalytic start to a process or programme, embedded in the Food and Agriculture Organisation, and other international partners together with participating countries: the standard assessment methodology will be taken on and used consistently. This would apply also to those ameliorative land management initiatives that *LADA* promises to stimulate. If the wide reaching plans for dissemination of products, international meetings materialise as provided for here, then durability will be ensured. The strong emphasis on capacity building will also help ensure sustainability.

4. SECONDARY ISSUES

4a Linkage to Other Focal Areas

The terms of reference state that “*the project has strong linkages with the land degradation, international waters and climate change focal areas*”. This is a land degradation project – in name and by definition – so that is not a link but the central issue. The links with international waters will come eventually when countries with neighbouring water bodies (both rivers and lakes) become directly involved in *LADA*. That will be achieved through reduction in pollution/sedimentation of water bodies and improved flow regimes when ecosystem function is improved. It will not happen significantly within the four years of the project, but should be a legacy. Climate change is addressed, as has already been noted, primarily by increasing carbon storage above and below ground. Turning it around, the impacts of climate change on the development of ‘hot spots’ of degradation is an articulated aim of the project.

4b Linkage to Other Global Assessments

The project document makes note of all the important assessments of land degradation that have taken place and methodologies that are in use currently. Paragraph 17 states clearly how *LADA* will ‘emulate’ relevant global assessments by addressing international land related processes. Paragraph 19 links *LADA* to the Millennium Ecosystem Assessment and ‘Complementarities

⁷¹ Especially the term ‘desertification’

⁷² This reviewer notes that the period from the first steering/ scientific meeting in January 2002 until now is already two and a half years: with so many stakeholders involved this is not surprising.

with Millennium Development Goals’ is articulated as an indicator of performance under activity 4.4 in the logframe.

With respect to *LADA*’s plan to identify ‘bright spots’ (‘best practices’ etc) it is noted that several of those organisations that have been working on this for several years have been included within *LADA* as partners^{73;74}. The principle one here (which indeed is given prominence in the document) is the WOCAT network whose remit has been almost precisely what *LADA* intends, namely the identification and documentation of bright spots and best practices in conservation. It is to be hoped that *LADA* can work closely with WOCAT and others, and use already developed standardised approaches. There will be little need *in this context* to develop new methodologies. What is strange is that this collation and synthesis of success narratives only happens in months 30-36: would an earlier focus on the ‘positive’ not send out better signals? The eventual ‘summary of best practice guidelines’ must demonstrate how it has evolved from various other publications along the same lines, and indeed could be basically a review of those, topped up with new cases and new analysis.

4c Other Beneficial or Damaging Environmental Effects

It is hard to identify beneficial environmental effects that have not been covered in the brief – other than perhaps general attention raising to the importance of land degradation and its link with poverty. The only damaging effects would occur if the assessment process was flawed, and investments were thus misdirected.

4d Stakeholder Involvement

Not only is the project internationally ‘inclusive’ (see ‘Linkage to Other Global Assessments’) but it also seeks to involve both national level scientists and decision makers and land users. *LADA* involves all the main actors who are/ have been involved in land degradation⁷⁵. Strategic alliances will be key both to speed up work, but also to avoid duplication or competition. What is not entirely clear, however, is whether sufficient account has been taken of the need for potential ‘negotiation’ that may be needed to resolve defensive positions and methodological territoriality. Perhaps this is an unduly pessimistic note to make, but the risk (expressed frequently in the logframe) of ‘willingness of partners.....’ is a very real one. Nevertheless the composition of the Steering Committee and the Scientific Committee will ensure inclusiveness and help provide a platform to pre-empt such problems.

4e Capacity Building

There is a full and comprehensive mandate to build capacity at various levels – notably amongst nationals. Paragraph 43, for example, notes that *LADA* will be executed primarily through national experts. Objective 2 is expressly to build capacity building, but under objective 1 capacity will be inevitably built also.

4f Innovativeness of the Project

The key to the innovativeness here is that *LADA* seeks to pull together a range of diverse methods of assessment – so the standardisation and implicit cooperation that would be associated is the innovative feature. On top of that, there is the question of connecting the methodology and assessment with the creative element of positive land management strategies:

⁷³ One potential key partner appears to be missing: that is IWMI with its ‘Bright Spots’ project – looking specifically at efficient use of water in agriculture - which is currently putting together a book highlighting ‘drivers’ and best practices

⁷⁴ This partnership comes out much more clearly in the logical framework than in the narrative.

⁷⁵ See box 5: Project Management Organogram

that is also innovative in a field where only one side of the coin (degradation *or* bright spots) has usually been the focus of previous studies.

5. MISCELLANEOUS POINTS

Finally there are a number of other points/ issues raised for consideration:

- The overall title of the project ‘Land Degradation Assessment in Drylands’ gives a rather unilateral impression of a project that is actually broader and more creative (in its development aspect) than this suggests. Perhaps a subtitle – to appear on documents - could be invented to redress that balance? Something along the lines of :

Problems and potentials of land management in marginal areas

Or

Standardising degradation assessment and stimulating better practices in marginal areas

Or

“Hot Spots” and “Bright Spots”: dealing with problem areas and stimulating best practices

- Following on from the above, there is a rather strange mismatch between the naming of the two objectives: the first basically comprises the whole of what is implicit in the title ‘*LADA*’ while the second is a more developmental objective - which is curiously headed ‘capacity building’ rather than, perhaps, ‘mitigation of degradation’. Capacity building is part of the first objective also.
- It is commendable that the outputs should be produced in ‘accessible form’ and not hidden away in electronic, digital, databases.
- Paragraph 21, sentence 3: should the word ‘address’ be replaced by ‘assess’? (...not doubting that ‘address’ is also true)
- Paragraph 24: why are ‘bright spots’ and ‘best practices’ and their development implications not named specifically amongst these five-fold ‘alternative scenarios’? The fifth (e) would seem the natural home for these.
- Box 1 would be more impressive if the areas figures were related to the percentages that the proposal generally uses

ANNEX C1: RESPONSE TO STAP/COUNCIL/IA COMMENTS

UNEP and FAO thank the STAP reviewer for a thorough and constructive review of the LADA Brief. Our joint response is summarised below.

1. Preamble

We apologise for the fact that the incremental cost analysis and the public involvement plan were not available at the time of review. These annexes are now complete and will be included in the response sent to the STAP reviewer. The delay in finalizing the required incremental cost annex was due to the difficulty in conducting an incremental cost analysis of a global project, in particular in establishing and costing of the global baseline. A detailed stock-taking exercise was undertaken in the PDF-B phase of *LADA* of (1) existing land degradation assessment methodologies, (2) remote sensing and global assessments, and (3) national assessments and the use of indicators. The PDF-B resulted in comprehensive reports on these issues (see summaries of reports in Annex G), but the problem of relating them to the cost of the baseline remains. Annex A now has a detailed incremental cost matrix, outlining the sources of information, baseline by project component and the basis for estimation of the baseline costs.

2. General comments

The reviewer points out the urgency of *LADA* to address a compelling environmental problem of land degradation that is pervasive in the world's drylands with strong linkages to poverty. We fully agree with this statement and would only add that land degradation is the greatest threat to what is the most threatened biodiversity, that is the species both wild and domesticated in the world's drylands.

3a. Scientific and technical soundness of *LADA*

The review notes that *LADA* intends to build international consensus on how to assess land degradation, but that the Brief does not adequately stress that this consensus should have the effect of re-focussing international attention on the problem, through helping eliminate scepticism. We agree with this observation and see the role of *LADA*'s international stakeholders such as the UNCCD, GM, international conservation NGOs and GEF-IAs as crucial in building the required consensus. Activities 4.3, 4.4 and 4.5 (see Annex B Logical Framework) already engage with the actions that will be required. The project Steering group will need to be reminded to give these Activities the proper emphasis and priority so that international attention is focussed on the problem and the scepticism that is common amongst some stakeholders counteracted by sound practice in land degradation assessment.

3b. Global environmental benefits

The review points out that land degradation is at the heart of ecosystem functioning with direct impacts on biodiversity and carbon storage. There is therefore no question that *LADA* will generate global benefits – a view that we fully support.

3c. Fit under operational programme

UNEP would like to point out that *LADA* was conceived before land degradation became a focal area of the GEF and *LADA* has therefore been designed to address land degradation as a cross-cutting issue affecting arid and semi-arid ecosystems. However, had the *LADA* design process started after the Second GEF Assembly that designated Land Degradation as a focal area, *LADA* would most likely have been designed under OP15 on Sustainable Land Management.

3d. Global and regional context

The reviewer is requesting a better explanation for the choice of pilot countries that will function as regional nodes for *LADA* and to what extent these countries are representative of their regions. He would moreover like to know why the Indian sub-continent has been omitted.

First, three countries to test and develop a methodological approach for *LADA* were selected in the PDF B phase. Due to the limits of funding in this phase, one country each in Africa, Asia and Latin America was selected. The criteria for selection included the status of the NAP, the overall in-country capacity to conduct environmental assessments and expressions of interest from countries in participating and supporting *LADA* during its PDF B stage. Senegal was considered to be the most suitable country in West Africa, largely due to the work undertaken by its Centre de Suivi Ecologique (CSE). China is not only Asia's largest country, but is investing considerable resources in controlling land degradation and monitoring of desertification. Likewise, Argentina was considered to be a leading country in Latin America with substantial drylands with regard to land degradation assessment and mapping and has undertaken considerable efforts to identify desertification indicators that can be used in monitoring.

For the full-size projects, an additional three countries have been selected to function as regional nodes for the Caribbean (Cuba), Near East, Mediterranean and North Africa (Tunisia), and Southern, Central and Eastern Africa (South Africa), using the same criteria as in the selection of the first three pilot countries. These countries are not only representative of their regions, but also have information to share and capacity to train their neighbours in using *LADA* tools and methodologies. If more co-financing is forthcoming during the appraisal phase, the Steering Committee will be urged to consider how the drylands of South Asia can receive more attention from *LADA*.

The reviewer is also raising the issue whether there will be room for national interpretations of *LADA* standards. Although the aim of *LADA* is to develop standardised methods and approaches for land degradation assessment, the need for flexibility is integrated into project design, and a menu of options, particularly for the local assessments will be offered. Outcome (Component) Three for detailed assessments has the largest budget provision, in part reflected by the need to build in flexibility for the different circumstances of countries and the need to address different socio-economic groups. Activity 3.2 is addressed to identifying user-needs, which includes the national interpretations of *LADA* standards. Participatory methodologies will mainly be used in the local-level assessments, whose main aim is to improve the understanding of land degradation processes and socio-economic drivers of land degradation. While the extent of degradation in different local assessments may not be directly comparable, processes and local perceptions will be. It is this improved understanding of the underlying causes and local people's understanding of land degradation that contribute to better remediation of land degradation at the 'hot spots' identified in the regional and global level assessments.

The reviewer notes that attention is drawn to countries in the post-project phase in the logframe, which indicates that *LADA* will expand to 'all signatory countries of the UNCCD', especially as there are already references to three additional countries that are not mentioned by name. Additional countries such as India and Mexico have already been included in the *LADA* PDF B phase using their own funds. As *LADA* products become available and readily appreciated, an up-scaling strategy will be developed (see Activity 4.6). UNEP and FAO strongly believe that up-scaling must be made an integral part of the final stages of the GEF-funded *LADA*. While international stakeholders such as UNCCD will be keenly involved, the designers of the improved methodology will be the best protagonists of the new techniques and their application.

3c. Replicability

A replication mechanism has been built into project design (see Activity 4.6 and comments above on the post-project phase) but as pointed out by the reviewer, the effectiveness will depend on the *LADA* approach being institutionalised within FAO, UNEP and other international organisations. Steps have already been taken to mainstream the *LADA* approach into FAO's and UNEP's assessment programmes, which is evidenced by the substantial co-financing coming from these organisations, particularly FAO.

The reviewer is also asking why *LADA* covers only the drylands and not more humid zones, where it surely also would be relevant. The reason for this is that biodiversity is most threatened by land degradation in drylands and there is therefore an urgency to start in drylands and to develop a methodology that is easily applicable in these zones. However, the long-term goal of *LADA*, as pointed out earlier in the review, is to expand the assessment to all countries that are parties to the UNCCD. *LADA* has been designed to have generic capability. Moreover, the project already covers some zones that range from the semi-arid to sub-humid as, for example, in the Caribbean.

3f. Sustainability

The reviewer points out that the four-year time frame is ambitious. In the Brief, we already note that *LADA* is intended to be a catalytic start to a process embedded in FAO together with other international organisations and participating countries. As a catalyst, *LADA*'s time frame is reasonably medium term with the anticipation that *LADA* outputs will be fully developed by the stakeholder organizations after the end of the project. Consequently, the OVis in the Logical Framework have been modified at Outcome level to accommodate a more limited achievement of the components and a better reflection of the embeddedness it is hoped will be achieved for the *LADA* processes.

4a. Linkages with other focal areas

See discussion under 3 on OP fit and the reason land degradation is addressed as a cross-cutting issue by *LADA*.

4b. Linkages to other global assessments

The reviewer raises the issue why the collation and synthesis of success narratives only happens in month 30-36 in the project, which is considered to be somewhat late. We agree with the reviewer that ideally this collation should come earlier. A preparatory stage to the collation has now been built into the Project Workplan (Annex D) from Month 24. However, the project proposers feel that successive narratives must be fully informed especially by the pilot detailed assessments (Activity 3.3 – Months 24-30). It is felt that success narratives are better completed after a full evidence-based has been compiled.

4c. Beneficial or damaging environmental effects

The reviewer states that the only damaging effects would occur if the assessment process was flawed, and investments were thus misdirected. UNEP and FAO will monitor the assessment process closely to make sure that this will not happen.

4d. Stakeholder involvement

The question is raised whether sufficient account has been taken of the need for negotiations to resolve methodological differences. The PDF-B process has already undertaken a number of international, regional and national consultations to reach agreement on the overall methodological approach and framework to be used by *LADA*. The future assessment process

has been designed to be consultative and participatory, with some in-built flexibility for indicator use in the local assessments. UNEP and FAO therefore do not consider this to be an issue.

4e. Capacity building

We agree with the reviewer.

4f. Innovativeness

We agree with the reviewer.

5. Miscellaneous points

Title: we agree with the reviewer where he notes that the overall title of the project ‘Land Degradation Assessment in Drylands’ gives a rather unilateral impression of a project that is actually broader and more creative than this suggests. The title *LADA* has been inherited from its early PDF stages and now has a resonance and recognition with national and international stakeholders. Therefore, we would wish to retain the present main title. The reviewer suggests a number of possible sub-titles, all of which have merit in that they better explain what *LADA* actually does. At this stage the project proposers would prefer not to take unilateral action to insert a sub-title but rather refer the issue to the first full Steering group meeting of the project.

Mismatch between the naming of the two project objectives: this point of the reviewer follows on from his suggestion relating to subtitle of the project. This will be accommodated in the same way as consideration of a sub-title. We agree with the reviewer that we would like to see the capacity-building and developmental elements of the project better profiled in the title, but we would wish to involve the key stakeholders in any formal decision to change.

Paragraph 21, sentence 3: [now in #22]. The reviewer’s suggestion has been followed.

Paragraph 24: [now in #25]. The reviewer’s suggestion has now been inserted under item (e).

Box 1: The point the reviewer makes would indeed reinforce the information in this box, but regrettably the data are not currently available.

ANNEX D: INDICATIVE PROJECT WORK PLAN

ACTIVITY WORK PLAN BY 6-MONTH PERIODS								
ACTIVITIES	PROJECT PERIOD BY MONTHS							
Completion of project activities by month....	6	12	18	24	30	36	42	48
<i>Activity 1.1:</i> Review of data sources, methods and frameworks for land degradation assessment for drylands at multiple scales								
<i>Activity 1.2:</i> Development of integrated information systems required at national level for data storage, retrieval, handling and use								
<i>Activity 1.3:</i> Implementation and testing of integrated information system for land degradation assessment and analysis								
<i>Activity 1.4:</i> Development and dissemination of guidelines for an improved needs-based and process-driven approach to dryland degradation assessment for different target audiences								
<i>Activity 2.1:</i> Collation, geo-referencing and digitising all available relevant information on sub-regional and global scales								
<i>Activity 2.2:</i> Baseline map at sub-regional scale no smaller than 1:1 million constructed								
<i>Activity 2.3:</i> Areas at greatest risk of dryland degradation identified and categorised								
<i>Activity 3.1:</i> National-level and local professionals develop the capacity to undertake detailed assessments of land degradation, related to key developmental questions such as livelihoods, poverty and food security								
<i>Activity 3.2:</i> User needs and information system needs assessments undertaken at national level								
<i>Activity 3.3:</i> Pilot detailed assessments undertaken in 'hot spot' and 'bright spot' areas; and recommendations developed for scaling-up the findings to national level								
<i>Activity 3.4:</i> National and local level policy processes for renewable natural resources information investigated and suitable entry points for land degradation information determined.								
<i>Activity 4.1:</i> Critical component framework developed for effective land degradation control at multiple scales and levels								
<i>Activity 4.2:</i> Collation and synthesis of success narratives of land degradation control and prevention								
<i>Activity 4.3:</i> LADA hosts a high-level international meeting convened through the auspices of FAO and UNEP of institutions involved in land degradation information, control, prevention and policy development								
<i>Activity 4.4:</i> LADA involved with other stakeholders in assisting policy development with UNCCD through SRAPs and NAPs at national and regional levels								
<i>Activity 4.5:</i> LADA works with UNEP and GEF Secretariat to develop support advice for implementation of OP12								
<i>Activity 4.6:</i> Final packaging, communication and exchange of land degradation information globally, regionally and nationally								



Initiation and main concentration of activity



Continuing follow-up activity and completion

ANNEX E: PUBLIC INVOLVEMENT PLAN

PARTNERS AND THEIR ROLES IN THE *LADA* IMPLEMENTATION

The PDF-B exercise has already allowed the participation of UN Agencies, international Research Centres and Centres of excellence, National Ministries and Organizations and local stakeholders as full partners *LADA*. The latter involved men and women of target communities, farmer associations, traditional leaders, pastoralists and agro-pastoralists. They will all contribute directly to the implementation of the project and be consulted by the other partners in project decision forums.

DIRECT STAKEHOLDER INVOLVEMENT

One of the most difficult steps in assessing and combating land degradation is to create a dialogue among stakeholders. Without this negotiation process, any assessment is prone to remain yet another report on which no action will be taken. The problem is not only to reach the grassroots level, but also to bring the different ministries involved (Environment, Agriculture, Forestry, Livestock, Water resources and Planning) to decide on their responsibility in land degradation issues. Therefore the *LADA* strategy developed includes two specific steps that take this into account as a first step where a user needs assessment is undertaken and a national task force is established and in the fifth step where a participatory local assessment of land degradation is foreseen. Moreover International awareness and country networking needs to be achieved as was already initiated during the PDF-B phase. Specifics of stakeholder involvement as already undertaken by *LADA* are given below and will be a basis for expansion under the project.

During the *LADA* PDF-B phase, user needs and national land degradation problems were discussed with the widest national and local audience: Government, NGO, farming associations, mass media, international and regional bodies were brought together in a national workshop that took place in each of the three pilot countries (Argentina, China and Senegal). This resulted in an inventory and prioritization of perceived problems linked to land degradation and in an estimate of their economic, environmental and social impacts. It included a user-needs survey identifying information products required for improved decision making at all levels. And resulted in the establishment of a National Land Degradation Task Force, involving representatives of all concerned stakeholders, existing networks and technicians.

At the local level stakeholders were involved too during the PDF-B phase, particularly in China where a local level *LADA* stakeholder consultation/training workshop was held, 7-10 April 2003, in Yanchi County, Ningxia-hui Autonomous Region. The workshop participants included: a) representatives from each of the six proposed pilot assessment study areas; and b) experts from the key national technical agencies that would assist with individual pilot assessments. The participants were introduced to the *LADA* global programme, the *LADA* DPSIR assessment framework and the steps involved in the pilot assessments. Similarities and differences between the 6 pilot areas were reviewed, and there was an initial discussion on: a) the causes (driving forces and pressures) of dryland degradation in China; b) the ecological and socio-economic consequences (impact); and c) alternative ecological and socio-economic indicators that could be used for the local level assessments

Four regional *LADA* workshops were organized during the PDF-B phase: one in Bangkok, Thailand for countries of Central and Southeast Asia, a second one in Dakar, Senegal for African countries. one in the Caribbean (Jamaica) with support of the Argentina pilot team and one in the Near East region (Syria). In total nearly 60 different countries sent representatives to these workshops to discuss the *LADA* approach and its national application.

During the PDF-A and PDF-B phase four international *LADA* workshops were organized in Rome (December 2000, January 2002, November 2002 and May 2004). More than 40 participants attended each workshop among which country representatives from Argentina, Brazil, Burkina Faso, China, Ethiopia, India, Senegal, South Africa, The Philippines, Tunisia and Uzbekistan; centres of excellence (University of Amsterdam, Bern and Vienna); international organizations (UNEP, UNESCO, WMO, UNCCD, GM, World Resources Institute, ISRIC, ICARDA, IFAD) and consortia such as WOCAT and the Millennium Assessment. In addition a number of international authorities on land degradation questions were invited to contribute on specific subjects.

OTHER PUBLIC AWARENESS RAISING INITIATIVES FORESEEN.

In addition to the local, national and international workshops organized referred to above three initiatives were taken to raise further public awareness raising during the PDF-B phase which will form a sound basis for the *LADA* project to built on and expand. These are the publication of a *LADA* brochure in 4 languages (Arabic, English, French and Spanish), the establishment of a *LADA* web site that contains more than 700 indexed documents, and a *LADA* virtual Centre that provides a platform for a network that permits exchange of country information. At the international level an Electronic Conference on Indicators for Land Degradation Assessment was launched in October 2002 and results published as a FAO report, this exercise is to be repeated under the project.

OVERVIEW OF INTERNATIONAL STAKEHOLDERS

Role/ Name	Main Interest	Specific Interest in <i>LADA</i>
Implementing Agency - UNEP	Plays a central role in major environmental assessments	LADA is consistent with UNEP's mandate and strategy for environmental observing and assessment (ref. the 1972 Stockholm action plan, and Agenda 21, Chapter 38) to analyse the state of the global environment, assess global and regional environmental trends, and provide early warning on environmental threats, based on the best scientific and technical capabilities available. Moreover, LADA partnership contributes substantively to the land module of UNEP's integrated GEO assessment framework. <i>LADA</i> addresses the action Plan strategic objective of "promoting multi-country co-operation directed to achieving global environmental benefits

Executing Agency - FAO	Plays a central role in major natural resources and environmental assessments and management	<i>LADA</i> will emulate the global assessment projects by addressing international land-related programmes and processes, especially the building of capacity to address land degradation. The project is consistent with the strategic framework of FAO and addresses the three interrelated global goals of FAO, particularly the objectives of food security, sustainable production and natural resource conservation
Technical Advisory Committee		
ICARDA	The International Centre for Agricultural Research in the Dry Areas (ICARDA) is one of the 15 centres of the CGIAR. Based in Aleppo, Syria and is representing all CGIAR Centres	Direct links with ongoing research agenda in land related programmes and projects in drylands and particularly in Africa Desert Margin initiative and the Dryland Initiative for WANA (with GM).
ACSAD	An important regional entity supporting Dryland countries of West Asia and the Near East	Direct links with ongoing research and particular expertise in dryland assessments through remote sensing and soil inventories in West Asia and Near East Region.
ESA	European Space Agency	Data provider and analysis of global remotely sensed images.
OSS	Observatoire du Sahel et du Sahara	Expertise in Monitoring Desertification covering a wide range of North Africa and Middle east countries
EROS Data Centre	The Earth Resources Observation Systems (EROS) Data Center (EDC) is a data management, systems development, and research field center for the U.S. Geological Survey's (USGS) National Mapping Division .	Direct links as data provider and analyst of global databases and remotely sensed images.
Essex University	Home of three major ESRC-funded projects, The Data Archive , the Institute for Social and Economic Research and Qualidata – Qualitative Data Service	Specific expertise in conservation of biodiversity.
SOW-VU Amsterdam	SOW-VU is a multidisciplinary research centre with a majority of economists.	Specific expertise in modelling and linking land degradation with socio-economic factors.
DEV/ODG/ East Anglia	DEV/ODG is one of the UK's premier development studies teaching and research institutions covering both the social and natural sciences: from economics, sociology, gender and politics - to environmental change, soil science and agronomy.	Specific expertise in natural resources conservation world-wide.
ISRIC	ISRIC is the World Data Centre for Soils of the International Council for Science and is accredited at the UNCCD	Specific expertise in global soil and terrain and land degradation mapping (SOTER) and analysis of remotely sensed data.
WOCAT	WOCAT was established as a global network of Soil and Water Conservation specialists. It is organised as a consortium of national and international institutions and operates in a decentralised manner	Global expertise and networks on conservation techniques and approaches. Mapping of land degradation and land conservation.

TPN-1	Desertification Monitoring and assessment (TPN-1) network was established by UNCCD to enhance the desertification monitoring and assessment capacities of countries.	Networking capacity and expertise in land degradation drought and desertification led By China as focal country of this TPN
CST and its Expert group	the Committee on Science and Technology (CST) of UNCCD provide it with information and advice on scientific and technological matters relating to combating desertification and mitigating the effects of drought.	CST is multi-disciplinary and open to the participation of all Parties. The CST Bureau selected 25 members of the Group of Experts who advise <i>LADA</i>
DESERT-LINK	A consortium of European Universities with specific expertise in networking in land degradation and desertification	Specific expertise on indicators of land degradation and building of networks in the subject matter.

NATIONAL AND LOCAL STAKEHOLDERS: COUNTRY EXECUTING TEAMS

CHINA

Lead Institute Name: National Bureau to Combat Desertification, State Forestry Administration/Secretariat of China National Committee for the Implementation of UN Convention to Combat Desertification (CCICCD)
 Director: Mr. Liu Tuo (Director General)

Number of Personnel and main qualifications:

The highest co-ordination body of China's combating desertification is China National Coordinating Group to Combat Desertification or CCICCD. The Office of the Coordinating Group or the secretariat of CCICCD is located on the premise of the National Bureau to Combat Desertification of the State Forestry Administration. The National Bureau is responsible for implementation of the National Action Programme in China and the undertaking of combating desertification across the country. The National Bureau to Combat Desertification has an authorized staff number of 20 people. The administration body is set up in the State Forestry Administration. The bureau's role and function is to administrating desertification combating across the country.

Associated Institutes, Ministries and NGO's:

China National Coordinating Group to Combat Desertification/CCICCD is composed of the following ministries (sectors): Ministry of Foreign Affairs, National Development and Reform Commission, Ministry of Commerce, Ministry of Science and Technology, Ministry of Finance, Ministry of National Territory and Natural Resources, Ministry of Railway, Ministry of Communication, Ministry of Water Resources, Ministry of Agriculture, State Forestry Administration, People's Bank of China, State Taxation Administration, State Environmental Protection Administration, Chinese Academy of Sciences, Office of the Leading Group for Poverty Alleviation, Office of Integrated Agricultural Development Leadership Group of the State Council, China Meteorological Administration. The Coordinating Group generally organizes a yearly meeting for each year, or hold occasional meetings when needed. Usually the Group-leading agency will convene the meeting for the Coordinating Group or CCICCD. It will invite the State Council leader who is in charge to attend the meeting. The liaison system has

been set up for the Coordinating Group and CCICCD with each liaison officer from each ministry.

Coordinating groups or leading groups for combating desertification has also been set up in 14 key provinces/autonomous regions/municipalities. Therefore, the effective management system for combating desertification from central to local level is formed, with an incremental working staff in the provinces and counties.

Other institutions (resources) of China National Coordinating Group to Combat Desertification and CCICCD are as follows.

- The Senior Expert Group of China National Coordinating Group to Combat Desertification
- Liaison Officers of China National Coordinating Group to Combat Desertification
- Independent Expert Roster for China's Combating Desertification
- China National Research and Development Center of Combating Desertification
- China National Training Center of Combating Desertification
- China National Desertification Monitoring Center
- China National Sand Control and Desert Industry Society
- Desertification Combating Agencies in the Other Various Sectors

SENEGAL

Lead Institute Name: Centre de Suivi Ecologique (Sénégal)

Director: Amadou Moctar Niang

Associated Institutes, Ministries and NGO's:

- Institut Sénégalais de Recherches Agricoles (ISRA)
- Institut des Sciences de l'Environnement (ISE)
- Direction de l'Environnement et des Etablissements Classés
- Direction de l'Agriculture
- Direction de l'Elevage
- Direction des Eaux et Forêts
- Direction des Parcs Nationaux
- UNCCD Focal Point
- Conseil National de Concertation des Ruraux (CNCR)
- UICN
- ENDA

TUNISIA

Lead Institute Name: Ministry of Agriculture, Environment and Water Resources (DG/ACTA)

Director: H. Farhat (D.Generl)

Associated institutes, Ministries :

- DG EQV, IRA – Medenine, DGGR.
- NGO's: UTAP –ATSS

ARGENTINA

Lead Institute: Secretaria de Ambiente y Desarrollo Sustentable
Director Pedro Pardez

Associated Institutes:

- Instituto Argentino de Investigaciones en Zonas Aridas.
- Universidad de Buenos Aires.
- Universidad de Cordoba.
- Instituto Nacional de Tecnología Agropecuaria.
- Instituto de Suelos. Centro de Investigaciones en Recursos Naturales (INTA)

SOUTH AFRICA

Lead Institute Name :National Department of Agriculture
Director:

Associated Institutes:

- Institute for Soil, Water and Climate (ISWC)
- NGO: Environmental Monitoring Group
- Department of Environmental Affairs and Tourism

CUBA

Lead Institute: Ministerio de Ciencia, Tecnología y Medio Ambiente
Director:

Associated Institutions:

- Caribbean Community (CARICOM) Secretariat
- El Instituto de Meteorología (INSMET)
- Environmental Education, Management and Information Center (CIGEA).

CIVIL SOCIETY INVOLVEMENT

NGOs of the participating countries affected by desertification and the loss of biological diversity have a catalytic role in the LADA project, particularly in components 3 and 4. They function best at the grassroots level and work with farmers and other resource user to assist in the development of participatory approaches for assessing agricultural and environmental problems and solutions related to land degradation. They have been associated to the national LADA task force during the PDF-B implementation in some pilot countries. The project will draw on the expertise of local NGO's such as the La Fundacion para la defensa del ambiente (Argentina), le Conseil National de Concertation des Ruraux (Senegal), Environmental Monitoring Group (South Africa), as on International ones, such as the IUCN in Senegal.

ANNEX F: AVAILABLE REFERENCE DOCUMENTS AND OUTPUTS FROM PDF-B

Annotated list of all documents and outputs from PDF-B stage

Published Outputs

FAO 2002. Land degradation assessment in drylands – *LADA* Project. Meeting Report 23-25 January 2002. *World Soil Resources Reports 97*, UN Food and Agriculture Organization, Rome. ISBN 92-5-104797-9

- this FAO report sets out the main statements at the *LADA* meeting in Rome and summarises the principal conclusions on progress towards the achievement of a full *LADA* GEF project.

FAO 2002. Land degradation assessment in drylands – *LADA*. Information Brochure. UN Food and Agriculture Organization, Rome. [In English, Spanish, French, Arabic]

-This is a *LADA* project information brochure, in English and Spanish. It highlights the goal, approach, expected outputs and impacts of the project.

Lantieri, D. 2003. Potential use of satellite remote sensing for land degradation assessment in drylands: application to the *LADA* project. Environment and Natural Resource Service, SDN, UN/FAO, Rome, 73pp.

- this report reviews information sources on the nature, extent, severity and impacts of land degradation on ecosystems and livelihoods in drylands as potentially assessed through satellite remote sensing. It concludes that in the near-term future remote sensing will increase dramatically in cost effectiveness and efficiency, but it will never ‘see’ or understand the socio-economic and cultural factors.

Van Lynden, G.W.J., Mantel, S. & van Oostrum, A. 2004. Guiding principles for the quantitative assessment of soil degradation: with a focus on salinization, nutrient decline and soil pollution. Report AGL/MISC/36/2004 UN Food and Agriculture Organization, Rome, and International Soil Reference and Information Centre, Wageningen, 61pp

- This is one of the principal PDF-B outputs intended to document the various types of quantitative assessment of soil degradation, as a guide to techniques for the main project.

Web Outputs

<http://www.fao.org/ag/agl/agll/LADA/default.stm>, Land Degradation Assessment in Drylands - *LADA*

- This is the *LADA* project website, provides the information on the project background, FAQs, project documents, publications, progress reports, and useful links.

<http://LADA.virtualcentre.org/pagedisplay/display.asp>, *LADA* Virtual Centre

- this *LADA* project web-site provides the information and documents under the headings of : *LADA* Description and Implementation; Partnerships and Links; Methodological guidelines and reviews; Data and Information; Meetings, events and contacts; Fora and collaboration. Including:

LADA Methodological Guidelines:

Land Degradation Assessment in Drylands (*LADA*): Guidelines for a Methodological Approach - This paper summarizes the advocated *LADA* approach for land degradation assessments.

Stocktaking of Dryland Biodiversity Issues in the Context of the Land Degradation Assessment of Drylands (*LADA*): Selection and Use of Indicators and Methods for Assessing Biodiversity and Land Condition - Same as above but with emphasis on biodiversity indicators.

[Potential Use of Satellite Remote Sensing for Land Degradation Assessment in Drylands. Application to the LADA Project](#)

<http://www.fao.org/ag/agl/agll/lada/glada.stm> LADA Global Study (GLADA: Global Land Degradation Assessment):

GLADA Approach: PowerPoint presentation

GLADA Results: Climatic Hot spots and Bright spots in Drylands

GLADA Results: Sample GLASOD outputs for each country in Africa and with population affected.

GLADA Results: Soil Erosion Processes

Photo-library of soil erosion processes (English, French, Spanish)

Document (French and English) Mapping Soil Erosion processes.

<http://www.fao.org/ag/agl/agll/lada/pilot.stm>, LADA Pilot Studies

- This web-site provides the links to web-sites of pilot studies in Argentina, Senegal and other participating and potentially-participating countries. Including:

LADA Case Studies

Deteriorated Soils in Egypt: Management and Rehabilitation - The report highlights the assessment of soils subjected to salinization in Egypt.

Salt-affected soils: South Africa - The report discusses the assessment of saline soils in the republic of South Africa.

Salt-affected soils of Malaysia - The report discusses the assessment of saline soils in Malaysia

Sodic soils in the drylands of Kenya - The report discusses the assessment of soils affected by salinization and sodification in Kenya.

Salt affected soils in dryland ecosystems of Uzbekistan - Land degradation assessment in the salinized areas of Uzbekistan.

LADA Case study Mexico - The report discusses the LADA approach and results obtained in Mexico.

LADA pilot study: application of an ecosystem approach to degradation assessment of drylands in Argentina - Goods and services approach applied to Argentina.

<http://www.medioambiente.gov.ar/suelo/programas/lada/default.htm>. Evaluación de la Degradación de Tierras en Zonas Áridas

- This website highlights the LADA implementation in Argentina (in Spanish)

<http://www.fao.org/ag/agl/agll/lada/arg/inicio.htm>, Evaluación de la Degradación de Tierras en Zonas Áridas: Proyecto LADA

- This is the Argentina LADA project web-site.

<http://www.cse.sn/>, Point focal (Sénégal) - Centre de Suivi Ecologique – (implementation)

- This is the web-site of LADA project implementation in Senegal (in French)

<http://www.fao.org/landandwater/agll/lada/emailconf.stm> LADA e-mail conference 9th of October - 4th of November 2002

This four-week e-conference discussed four themes: methods and indicators; national level indicators and linking local to national level assessment; local level indicators; global level indicators, monitoring

network, and scaling-up and -down issues. 143 people subscribed and 35 of them people contributed to the conference.

CD-ROM: Properties and Management of Drylands

A CD-ROM is at an advanced stage of preparation. It links relevant websites in a systematic approach. Major sections include:

The World's Drylands

Sub-Regions: Information – with country studies, guides, fact sheets, National Environmental Profiles, UNEP-GRID State of Environment reports

North America

South America

Africa

Europe

Asia

Australasia

Natural Resources in Drylands – with technical summaries, country studies, process analysis and description

Climatic conditions and trends

Geomorphology

Soil resources

Water resources

Forest and tree resources

Vegetation types

Animal species, races and biodiversity issues

Energy resources

Population and Economy of Drylands – identifying the major websites for information

Population status and trends

Settlement pattern and historical outline

Rural living conditions

Livelihood and food security

Poverty in drylands

Economic and poverty indicators

Constraints in terms of land and water management

Access to resources/tenure issues/rights

National policies impact on dryland communities

Land Management Practices and Strategies for Drylands – includes case examples, information sources and experts to contact (with e-mail addresses)

Main present land use systems and policies

Biodiversity management issues and threats

Management practices at different scales

Documentation and evaluation of 'good land management practices'

Proposed new land management strategies and tools

Rural development

Case studies and lessons learned

Land Degradation/Desertification – Diagnosis and Assessment – main web-site information sources worldwide

Definitions of land degradation/desertification and major impacts

Causes and types of degradation and desertification

Indicators

Monitoring and assessment methods

LADA-project
Restoration and rehabilitation
Annex
Pictures and Videos

Other Web-sites and Web Links

LADA and closely-related projects feature on 277 web-sites, found by using the phrase “land degradation assessment in drylands” through *Google* search engine. The more relevant are:

<http://www.gm-unccd.org/FIELD/Multi/GEF/Global/lada.htm>. Land Degradation Assessment in Drylands (*LADA*)

-This web-site describes the nature of the *LADA* project and provides the links to *LADA* documents. The web-site is under the main web-site of the Global Mechanism of UNCCD.

<http://earthwatch.unep.net/desertification/index.php>. Desertification and Drought

-This web-site carries a brief description of *LADA* project and provides linkage to *LADA* web-site. The site is hosted by the United Nations System-Wide Earthwatch.

<http://www.gefonline.org/projectDetails.cfm?projID=1329>. Global - Land Degradation Assessment in Drylands (*LADA*)

- This web-site is under the GEF’s main site, provides the features of the *LADA* project and links to the PDF-B document.

http://www.adb.org/projects/PRC_GEF_Partnership/news_events.asp. Land Degradation Assessment for Drylands (*LADA*)

- In this web-site the Asian Development Bank introduces the *LADA* project as a major event relevant to the PRC/GEF Partnership on Land Degradation in Dryland Ecosystems.

<http://www.unccd.int/cop/cop6/CSTsubmissions.php>

-this web-site, hosted by UNCCD, provides links to *LADA* progress reports.

<http://www.wocat.org/news16.asp>. The WOCATEER (No. 6- Autumn 2002)

–This issue of WOCAT Newsletter highlighted the outline for further collaboration between WOCAT and *LADA*

LADA CD-ROMs

Individual Papers and Documents

Benites, J 2002, From Soil Conservation to Conservation Agriculture. Paper presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- this paper highlights the shifting emphasis in conservation approaches and outlines the basic principles of Conservation Agriculture.

Berry, L 2003. Land degradation in China: Its extent and impact

- This paper reviewed the regional and national assessments of the costs and other impacts of land degradation in China, analysed the direct and root causes of land degradation, highlighted the responses to land degradation in China.

Brinkman, R 2002, Participatory and multi-stakeholder processes to assess pressures, impacts and identify response options to land degradation in dryland areas. Paper presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- The paper reviews the participatory methods and tools available for selection and adaptation to *LADA* purposes and needs. The paper also suggests establishing partnership between staff working on *LADA* and local communities and an effective international communication and information structure.

Griesbach J.C 2002, PAP/RAC erosion mapping methodology. Power-Point presentation at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

-this Power-point presentation gives the background, phases and achievements of the Soil Erosion Mapping Programme.

Koohafkan, P 2002, Approaches and partnership building. Power-Point presentation presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- This presentation reviews the global assessment of the state of the land & water resources; highlights the *LADA* and its PDF-B phase objectives; sets out the agenda and expected outputs of the meeting.

Koohafkan, A.P 2002, Draft conceptual framework for *LADA*-Indicator search and modeling approach. Power-Point presentation at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- This presentation reviews a list of indicators related to each topic of each component of *LADA* framework and puts these indicators in specific geographic and scale context of *LADA*.

LADA secretariat 2002, Issues that may need discussion in the Technical Advisory Group and questions that may help structure the discussion. A document to the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- To facilitate the discussion at the TAG workshop, this document sets out the questions related to the issues on information needs, process, capacity building, institutions and partnerships, networking, communication and public awareness strategies.

Lantieri, D 2002, Use of remote sensing for the *LADA* project. Power-Point presentation presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- This presentation includes a brief introduction on remote sensing, recent studies/experiences on the use of remote sensing for desertification, and potential use of remote sensing within *LADA* project

Lilin, C 2002, The socio-economic aspects of land degradation: factors and perceptions. Paper presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- The paper covers three issues: the role of structural socio-economic factors for land degradation; structural factors of land degradation and communication; tools achieving integration of perceptions of land degradation issues by different actors.

Liniger, H 2002, WOCAT – World Overview of Conservation Approaches and Techniques. Paper presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- The paper gives the mission of the WOCAT and its linkage with on-going international and national initiatives, and its potential contribution to UNCCD and *LADA*; the research needs on the assessment of degradation and good resource use are also highlighted.

Lloyd, B 2002, Landcare: a community-based approach to sustainable development. Power-Point presentation presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- This presentation introduced the Landcare initiative in Australia, the contents include background, approaches, achievements, problems and lessons learned from the decade of Landcare.

Mahler, P.J 2002, *LADA* and its associated activities: an extended implementation strategy. Paper presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- Based on the review of the major strategic options in coping with land degradation problems, the paper proposes a step-by-step process for priority setting and decision making.

Montanarella, L 2002, The European land degradation monitoring system. Paper presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- The paper highlights the new EU thematic strategy on soil and objectives of EC communication; introduces European Soil Database and its applications, as well as the model of Pan-European Soil Erosion Risk Assessment (PESERA)

Oldeman, R 2002, Assessment of methodologies for dryland land degradation assessment. Paper presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

-The paper reviews the methodologies of GLASOD and other similarly initiatives in the last decade; the methodologies identified at the earlier *LADA* workshop are also reviewed.

Planchon, F. L 2002, **Land degradation in Senegal**. Power-Point presentation presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- This presentation highlights the state, impact of and response to land degradation in Senegal; illustrates the role of geomatic in the assessment of land degradation Introduction.

Reijntjes, C 2002, Land degradation and low external input sustainable agriculture. Paper presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- This paper highlights the contribution of Low External Input and Sustainable Agriculture (LEISA) and Conservation Agriculture (CA) to reversing land degradation, increase production and to lower production costs and energy use.

Rydén, P 2002, The need to strengthen support to an integrated land degradation assessment. A speech delivered at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- The speech highlights the support of Global Mechanism of the UNCCD to *LADA* project, particularly on facilitating the linkage between regional networks on desertification monitoring and *LADA* project.

Shaxson, T.F 2002, Shifting views on land degradation. Paper presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- The paper restates the concern on land degradation, outlines the key factors in reversing land degradation and bases for effective and lasting improvement; the implications for *LADA* project are also discussed.

Stocking, M.A 2002, Land degradation and rehabilitation: philosophy and history. Power-Point presentation presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

This presentation highlights the lessons learned from past; presents some philosophical and contextual issues related to land degradation assessment; and maps out the important thematic components of *LADA*.

Sun, S 2002, Some aspects and methodology of desertification monitoring in China. Paper presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.

- The paper highlights the extent of desertification in China and presents the methodologies, activities, and progress on desertification monitoring in China.

Tengberg, A 2002, UNEP/GEF Statement for *LADA* workshop. A speech delivered at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.
- on behalf of UNEP/GEF, the speech outlines the needs and challenges that we are facing in developing *LADA*.

Velayutham. M 2002, Land degradation and restoration in India - an overview. Paper presented at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.
- The paper highlights the soil survey, land rehabilitation strategy and programme in India

Vieira, S.R 2002. Land degradation assessment. Power-Point presentation at the Land Degradation Assessment in Drylands (*LADA*) meeting, FAO, 23-25 January 2002.
-this power-point presentation introduces indicators for land degradation assessment at farm, state and national levels, and some soil conservation projects in Brazil.

Yang, W., Zhang, K. and Yang, X 2002. Report of Land Degradation Assessment for the Arid land Areas in China (Initial Draft).
- This report reviewed the situation of degradation assessment in China, presented the results of need assessment and China's desertification combating programmes, recommendations were made regarding the development of monitoring system and experimental areas through *LADA* project.

LADA secretariat 2002, Land Degradation Assessment in Drylands (*LADA*) – First Progress Report

- The report summaries the progress made and problems encountered in the period of Jan -June 2002. The activities underway in the period include pilot studies, e-conference, *LADA* web-site and RS methodology.

LADA secretariat 2003. Land Degradation Assessment in Drylands (*LADA*) - Second Progress Report

- The report summaries the progress made and problems encountered in the period of July - December 2002. The activities underway in the period include *LADA* methodology development, awareness raising, technical workshop, pilot studies, socio-economic issues, project web-site, RS methodology, and high resolution land cover data.

LADA secretariat 2003. Guidelines for a Methodological Approach. Land Degradation Assessment in Drylands (*LADA*) (draft version 12 May 2003).

- This document outlines the rationale of *LADA* project and summarises the *LADA*'s seven-step approach.

L'évaluation De La Dégradation Des Terres Au Sénégal (Projet FAO Land Degradation Assessment (*LADA*) : Rapport Préliminaire)

Unpublished Meeting Reports

LADA secretariat 2000, Report of an international workshop, FAO, Rome, 5-7 December 2000.
- This report summaries the discussions on PDF-A and background papers of *LADA* project and set out the statement on supporting further elaboration of the project by the preparation of a Block B grant proposal (PDF-B) for submission to GEF.

LADA secretariat 2002, Report of Technical Meeting Land Degradation Assessment in Drylands (*LADA*), FAO, Rome, 5 - 8 November 2002.

- This report summarises the seven-step methodology as agreed by participants, outlines expected outputs of pilot studies related to the issues raised at the workshop, clarifies the role of web-site and e-conference for information sharing and exchange.

LADA task force 2003, Land Degradation Assessment in Drylands, Report of the E-mail conference, Oct-Nov 2002.

- This two-part reports summaries the discussions of the e-conference. Part I is the conference report and Part II presents the extracts and summaries from contributions.

LADA task force 2003, Taller Nacional sobre Evaluación de Degradación de las Tierras en Zonas Aridas. Proyecto *LADA* 12 al 15 de mayo de 2003- Buenos Aires Argentina. (*National Workshop Programme of the Argentinean Task Force*)

ANNEX G. SUMMARY OF PROGRESS ON LADA GUIDELINES, METHODOLOGY DEVELOPMENT, CASE STUDIES & GLOBAL ASSESSMENT

INTRODUCTION

This Annex reviews and comments on the main outputs of the LADA project under its PDF-B phase. It is complemented by Annex F which lists the majority of reference documents and outputs from the PDF-B. There are a number of figures and diagrams (not included in the main Brief). The text is divided into three main parts: (1) development of the methodological approach; (2) global land degradation assessment; (3) national and local assessments, including pilot and case studies. A final synthesis is also included.

I. METHODOLOGICAL *LADA* APPROACH DEVELOPED

GUIDELINES FOR A METHODOLOGICAL APPROACH

Koohafkan et al. (2003) developed guidelines for a methodological approach for assessing land degradation in the drylands. The following summarizes the approach based on earlier findings and reports produced for LADA notably The LADA framework (Ponce-Hernandez, 2002), the review of land degradation databases and methods (ISRIC, 2002) and more specific guidelines on the use of indicators (Snel and Bot, 2002 and FAO, 2002 on land degradation indicators and their use; Lane and Bunning, 2003 for biodiversity; Van Lynden, 2004 for fertility decline, salinization and pollution).

LADA follows a participatory, decentralized, country-driven and integrated approach and makes ample use of participatory rural appraisals, expert assessment, field measurements, remote sensing, GIS, modelling and other modern means of data generation, networking and communication technologies for share of information at national and international levels.

Key elements of the approach are:

- Participation and inclusion of different perceptions of land degradation
- Combination of expert assessment & local knowledge
- Use of adapted assessment tools for specific environments.

In the following, the main emphasis is on the technical aspects rather than on the participatory aspects. A toolbox of methods is proposed to tackle various aspects.

The arid, semiarid and dry subhumid zones cover 38.6 million km², 29 percent of the global land area. These are the zones covered by the LADA project. About 1.8 billion people, 30.5 percent of the world's total, are living in these areas. Even though they have on average the same extent of land as people elsewhere, the productivity of these lands is severely constrained by lack of precipitation. The classification scheme used for classifying the lands into arid, semiarid and dry subhumid lands is the ratio annual precipitation/potential evapotranspiration. This seems appropriate even though the ratio has some shortcomings; it is highly variable from year to year for a given location, and the variation generally increases with increasing aridity. Therefore, semiarid lands are not only drier than dry subhumid lands; they are also more variable from year to year. Some measure of this variation was identified under the GLADA study (Figure 1).

Hotspots / Bright Spots
Analysis based on P/PET (1960 - 1995)

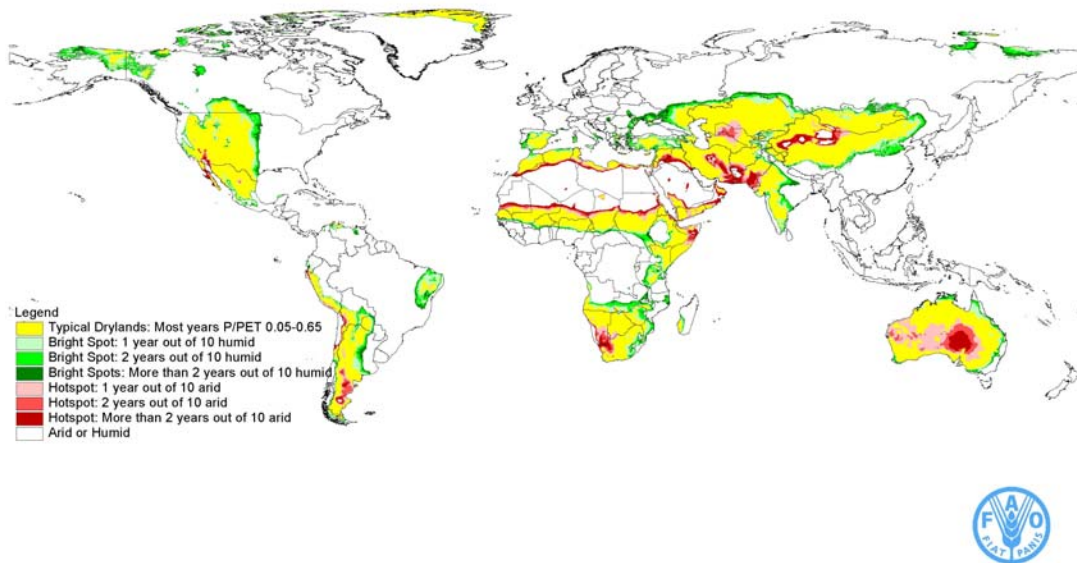


Figure 1. Hot spots and bright spots based on climatic variation in drylands

Koohafkan et al. (2003) proposed that the causes, status and impacts of land degradation and possible responses be determined and assessed at the same time, implying that each of these should be characterized and evaluated. **This holistic approach requires that land systems be evaluated, rather than single locations.** One approach advocated is to combine the global farming systems database with the dryland areas including population affected (Figure 2).

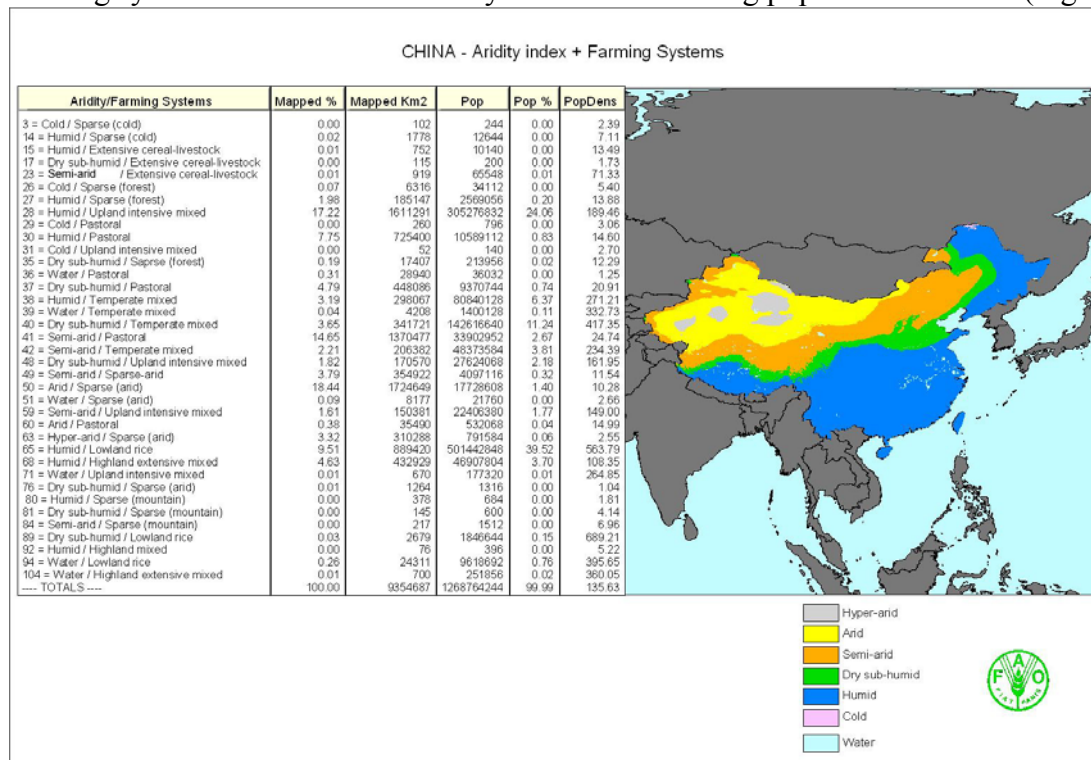


Figure 2. Farming systems, Drylands and Population in China

The proposed methodology is based on the DPSIR framework (Figure 3).

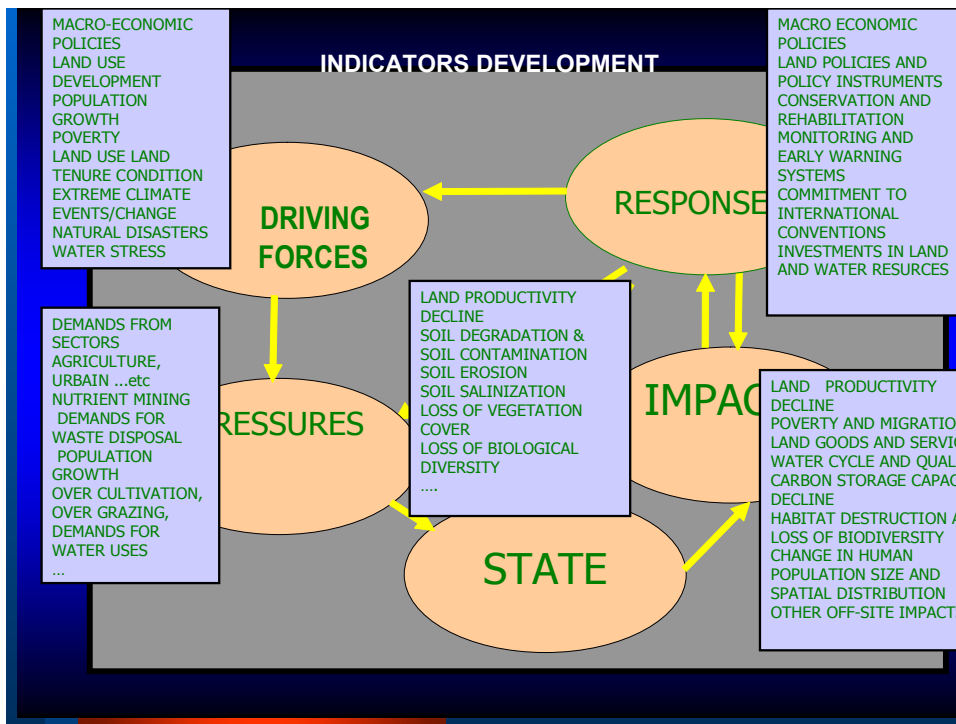


Figure 3: DPSIR Framework with some examples of indicators to be used

In Figure 3, D indicates the driving forces, P the pressures, S the condition of the land and its resilience, I the impacts of the increased or reduced pressures, and R the responses by the land users to release or reduce the pressures on the land. A large number of possible indicators have been suggested for each of these depending on the scale being addressed. A primary advantage of the approach is that it allows flexibility for each country to adopt indicators pertinent to their situation and specific problems, but the disadvantage is that it may be difficult or not feasible to compare different countries. Even within an individual country, it may be difficult to get a consensus of what indicators should be used. Two vital documents in this respect are the LADA email conference on indicators (FAO 2001) and the DESERTLINK approach (<http://www.kcl.ac.uk/kis/schools/hums/geog/desertlinks/index.htm>). The latter is an excellent basis for national consensus building around problems and indicators, although it should still be completed for areas outside the Mediterranean.

A vital part of the Methodological Approach is the **identification of “hot spots” and “bright spots.”** The guidelines state “a bright spot may be an area without significant land degradation that is stable, naturally or under the present conditions of sustainable management, or a formerly degraded or vulnerable area where land protection or land rehabilitation has been successful or is in progress; bright spots may include low-lying areas where little degradation takes place or areas where degradation was a problem in the past but where successful rehabilitation measures have remedied the situation” and that “a hot spot is an area where swift remedial action is required because land degradation is particularly severe or fast, with actual or expected particularly harmful or extensive impacts on-site or off-site, or because the land is very vulnerable and threatened by degradation.”

As defined for the LADA project, land degradation is a natural process or a human activity that causes the land no longer being able to sustain properly its economic functions or the original ecological functions. An example how this can be done more systematically was illustrated in the Senegal Pilot study by studying land cover changes complemented by ground

checks (Figure 4). The global imagery for the 1970s to 2000 is available worldwide; the LADA project would be an ideal vehicle to study changes in major land cover and use (Agriculture/Forestry/Pasture) globally and to make images available to dryland countries.

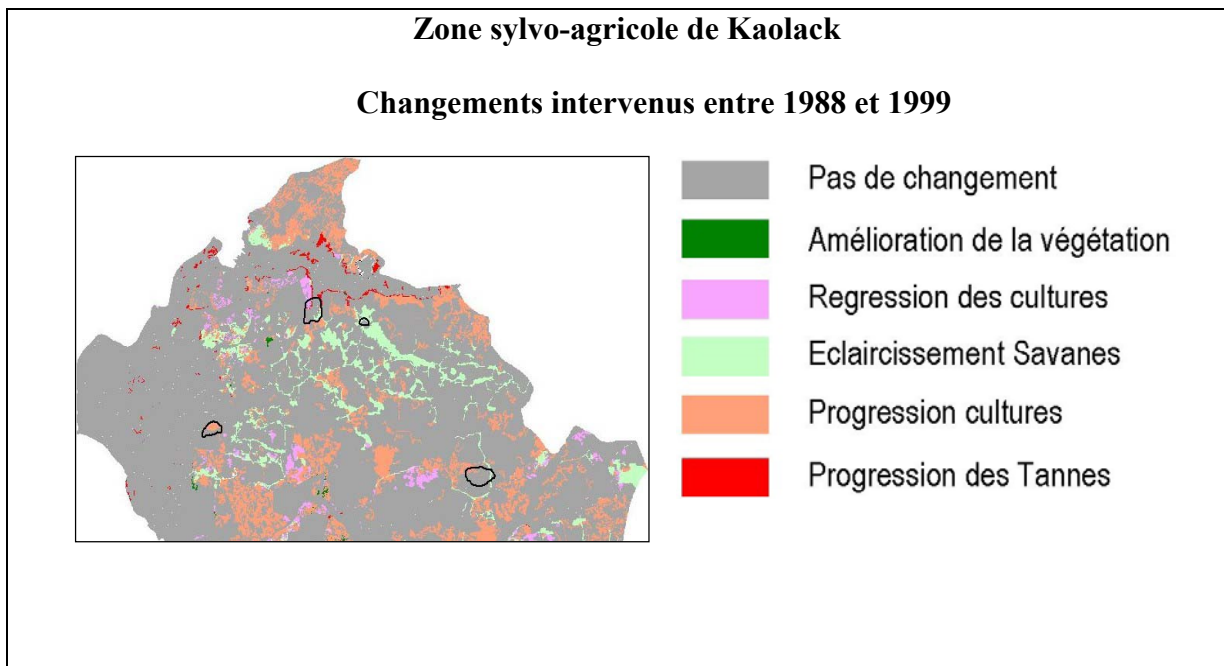


Figure 4. Change in land cover over 10 years in Kaolack (Senegal)

The core of the LADA project resulted in the seven-step approach suggested in the guidelines (Figure 5). The most challenging task will perhaps be identifying the indicators to be used and to determine how the indicators will be measured quantitatively. Also, there has not been much discussion in the Methodological Approach regarding the difference between assessing land degradation of rangelands and croplands. The indicators used to assess cropland degradation will likely be substantially different from those used for rangeland, and the proportion of rangeland and cropland will be quite different between arid, semiarid, and dry subhumid regions. Therefore, there may be merit in having separate task forces for cropland and rangeland assessment.



Figure 5 The LADA seven steps approach with corresponding outputs.

APPROACH AND DEVELOPMENT OF A METHODOLOGICAL FRAMEWORK FOR LADA (Raul Ponce-Hernandez, 2002)

The proposed approach is to develop a **methodological framework** rather than a method. It is hoped that the framework will bring enough flexibility, in terms of the procedures, techniques and state of the databases, to accommodate the particular circumstances of the country or region where it is applied.

The base entity for the application of the methodological framework is the **country**. It is envisaged that national assessments, based on adequate, statistically sound sampling frames, can be the basis for upscaling or downscaling to any subnational or even global levels. Procedures for achieving these are part of the framework.

The LADA methodological framework is underpinned by theoretical considerations. An **integrative modular systems approach** is proposed for the LADA assessments. The modules consists of sets of procedures, which have been identified as being part of a main core of thematic or disciplinary procedures, integrated into a unit which performs a major task(s) for the degradation assessment according to the driving forces–pressures–states–impacts–responses paradigm. Each modular array performs a set of core tasks and takes input form and delivers output to other modules. The flows of data and information are all integrated. Further, some of the modules could even have some degree of overlap. The emphasis here is on bringing the necessary elements of information and data together, from the five different capitals of the livelihood systems: natural, physical, social, human and financial capitals. These capitals translate into the integration of information and data from biophysical, socio-economic, cultural and demographic databases and information.

In addition to attempting to integrate socio-economic and biophysical data and information, the approach to the framework development attempts to reconcile scale-dependent views of the land degradation assessment problem in drylands. From the small scale, generic view provided by changes in land cover and other parameters such as soil reflectance through satellite imagery and remote sensing, to the detailed view of a farm plot on the ground where features of the degradation processes and their indicators would become far more clear. In this

sense, the approach to the methodological framework development can be said to be a compromise between top-down and bottom-up in terms of scale.

The procedures for the assessment under the approach are based fundamentally on indicator variables and “proxies”. However, the framework would use any “hard” data provided by detailed measurements (e.g. sediment plot data) wherever they are available.

The modular array can be summarized into six basic steps at the highest level of methodological generalization:

1. Definition of target areas for the assessment.
2. Zoning or stratification of such areas (partition of variability)
3. Application of a sampling frame.
4. Performance of ground field assessments and land cover:
 - Apply field degradation assessment methods based on field indicators.
 - Facilitate a participatory auto-diagnosis process where farmers and land users identify degradation processes and problems.
 - In parallel, perform remote sensing image analysis of the selected scene and map the state of vegetation cover through band ratio indices (NDVI, GVI, etc.) and through the Spectral Mixture Analysis (SMA) approach.
5. Integrate results, map degradation and identify causality:
 - Define legend for degradation types and intensity classes.
 - Integrate driving forces (D) and pressures (P).
6. Integrate analysis of impacts (I) and responses (R) from the socio-economic assessment and the participatory “auto-diagnosis”.

The final step is the reporting of findings, in terms the spatial distribution of types and intensity of land degradation as well as in terms of a concrete and succinct description of its causes (driving forces and pressures), the impacts on the different livelihood sub-systems and the responses to those impacts by the stakeholders.

GUIDING PRINCIPLES FOR THE QUANTITATIVE ASSESSMENT OF SOIL DEGRADATION

Van Lynden et al. (2004) discuss the guiding principles for quantifying soil degradation. They considered soil degradation as a process that describes human-induced phenomena which lower the current or future capacity of the soil to support human life. In contrast, they considered land degradation as the reduction in the capability of the land to produce benefits from a particular land use under a specified form of land management. They considered soil degradation as one aspect of land degradation with others being degradation of vegetation or water resources. Van Lynden et al. (2004) also focused only on indicators for salinization, nutrient decline and soil pollution. There are many other indicators commonly used for assessing soil degradation.

The document draws heavily on work previously used in GLASOD, ASSOD and SOVEUR so the indicators are well defined and documented. The assessments are largely qualitative so the data requirements are limited and rely largely on expert knowledge. However, van Lynden et al. (2004) stress that expert knowledge should preferably be supported by hard data. They also point out that sustainability is a problem of equilibrium, which applies at all scales and to all aspects of land use. Of interest was their view that it is not possible—and probably not desirable—to define sustainability today on behalf of the next generation. They stressed, however, that it is possible to maintain the potential of land resources so that future generations can develop their own values, priorities and possibilities to satisfy their needs.

Indicators describe the rate, intensity or magnitude of complex processes (Van Lynden et al. 2004). Indicators are statistics or measures that relate to a condition, change or quality, or change in state of something valued. Indicators of pressure show the pressure on land from

human activities. Indicators of state describe the land resource conditions, and changes in this condition over time. Response indicators reflect the action taken by society, in the form of governments, organizations and individuals, in reaction to pressures or changes in the state of a resource. They suggest that soil quality is the most restrictive, followed by land quality and then sustainable land management. Soil quality is effectively a condition of a site, and it can be studied using soil data alone. Land quality requires integration of soil data with other biophysical information, such as climate, geology and land use. Land quality is a condition of the landscape. It is a biophysical property, but includes the impacts of human interventions on the landscape. Sustainable land management requires the integration of land quality with economic and social demands.

Van Lynden et al. (2004) lay out the rationale and framework for assessing soil degradation. They essentially ask: What is happening? Does it matter? Are we improving? Are we on the whole better off? They propose the selection of benchmark sites and following changes over time. Proposed indicators were classified as “sensitive” or “moderately sensitive”, to be measured every 5 years and 10 years, respectively. These recommendations were based on the work of Acton and Gregorich (1995). Their placement of organic matter and total nitrogen in the list of sensitive indicators may need reconsideration. These characteristics change very slowly, particularly in dryland regions, with the exception that they can decrease fairly rapidly when native vegetated lands are cultivated and used for cropland. Arnold et al. (1990) estimated the time required for measurable changes to occur in various soil parameters and suggested that 10 to 100 years are required to determine measurable changes in soil organic matter contents. Again, decreases can occur much more rapid than increases, and the magnitude of these differences tends to increase with increasing aridity. Organic matter content is of critical importance and Van Lynden et al. (2004) suggest that soil quality will likely be based on soil organic matter turnover, particularly the dynamic carbon pool most affected by environmental conditions and land use change.

Soil organic matter is the most important single characteristic of dryland soils and that land degradation increases rapidly with declining soil organic matter levels. There are two important reasons: declining fertility and declining water availability. The most limiting constraint in dryland areas is water, and declining soil organic matter makes the already limiting water supply even more limiting because declining soil organic matter levels reduce soil structure, plant available soil water holding capacity, water infiltration and increases water runoff. The primary source of many of the nutrients for crop production also is derived from the decomposition of soil organic matter so soil fertility declines with declining soil organic matter levels.

Monitoring is the repeated assessment of land condition over time so that inferences can be made on stability or changes in land condition (Van Lynden et al. 2004). These authors point out that there are many pitfalls with monitoring changes because of sampling problems, variations in laboratories and procedures, and other variables. These problems apply to all soils, but they become even more serious in dryland soils where the amounts are generally lower and variations greater than in soils located in more favoured areas.

In summary, van Lynden et al. (2004) have outlined the guiding principles for assessing soil degradation. Their paper restricts itself to certain land degradation types only. The full *LADA* project will need to build on this base and provide guidance for the quantitative assessment of other types of land degradation.

SELECTION AND USE OF INDICATORS AND METHODS FOR ASSESSING BIODIVERSITY AND LAND CONDITION IN LADA

Lane and Bunning (2003) prepared a detailed report dealing with dryland biodiversity issues in the context of LADA. They stress the need for choosing a short list of indicators and then developing a cost-effective sampling strategy so that sites can be monitored for changes. Even though they stressed the need for choosing a short list of indicators, they listed some 80 potential indicators at local, ecosystem and national levels. It appears somewhat difficult to interpret the list of potential indicators in their Table 1. The list includes indicators of soil condition, crop and livestock diversity and more complex indicators concerned with soil biodiversity and aquatic bio-indicators.

Lane and Bunning (2003) stated numerous times in their paper that land degradation and consequent loss of biodiversity is often linked to poverty, migration and food insecurity. While this link often occurs, there are numerous examples of severe land degradation and loss of biodiversity in developed countries in the absence of these factors. One could even argue that land degradation is often more pronounced in some developed countries because of the intensive use of power tillage that can accelerate mineralization of soil organic matter, which may have a marked effect of the loss of biodiversity.

The authors point out that a practical and meaningful land degradation assessment for the drylands is a major challenge and that slow progress has been made in developing robust and practical indicators of biodiversity. They attributed this to a) scientific uncertainty and poor understanding of ecosystem processes and functions and the complexity of ecological systems; b) the wide range of policy-relevant issues that fall under the umbrella of biological diversity and land degradation; c) the substantial variation in environmental and land use conditions among different dryland ecosystems, coupled with high local heterogeneity; and d) the breadth of biodiversity and degradation attributes and the inherent risk of an over-complex, time consuming and costly assessment process.

Lane and Bunning (2003) state that resilience is the ability of an organism, population or community to show insensitivity or reduced sensitivity to disturbance. The characteristic of a sustainable ecosystem is that it never reaches threshold levels of irreversibility and it achieves a sufficient level of economic efficiency and social welfare. Agricultural biodiversity encompasses all biological diversity at the genetic, species and ecosystem levels that contributes directly or indirectly to agricultural production and food security. The authors did recognize and discuss differences between crop-based agro-ecosystems and livestock and range systems. They stated that the degree of biodiversity in crop-based systems depends on the diversity of vegetation within and around the agro-ecosystem, the permanence of the various crops, the intensity of management, and the extent of isolation from natural vegetation. For livestock and range systems, biodiversity depends on the diversity of farmed and wild animal species, the vegetation composition of pasture/range and habitats they provide, and the management of the system.

The authors present useful information about people's reliance on wild plants and animals for medicines, genetic resources, food supplements and other goods such as food and fibre. The most destructive function of tillage is that it accelerates the rate of soil organic matter decomposition that leads to soil fertility decline and loss of biological activity.

In summary, the paper dealing with biodiversity presents important information relating to LADA. It would be helpful, however, if the information could be somewhat more focused and if some of the less pertinent information would be deleted. It would be particularly useful to have some guidance on selecting the indicators that are most relevant, available, and affordable – qualities that the authors stressed in the introduction of the paper.

POTENTIAL USE OF SATELLITE REMOTE SENSING FOR ASSESSING LAND DEGRADATION IN DRYLANDS

Lantieri (2003) reviewed the potential of spatial remote sensing for application to the LADA Project. Because of the high number of sensors available today and the wide range of characteristics, Lantieri grouped the remote sensing data into four categories: low- and medium-resolution civilian optical satellites, high-resolution civilian optical data, very high-resolution civilian optical data, and space-borne radar data.

Lantieri concluded that there are six broad applications or remote sensing that are relevant to LADA. These are 1) land cover (and some land use) which includes vegetation types and their changes over time 2) land form and landscape; 3) vegetation activity and growth; 4) rainfall and related droughts; 5) soil types and state (moisture and level of erosion); and 6) indicators based on climate and ecological modelling (still under research).

Remote sensing programs provide a good tool for seeing a “big picture” of differences but very limited data on what causes the differences. Since the early remote sensing programs of the 1970s, many improvements have been made for getting better pictures, but lack of ground truth information prevents accurate interpretations. For the LADA program, remote sensing probably offers the greatest potential for looking at rangelands because remote sensing does a good job of sensing vegetation differences. Remote sensing can also provide useful information regarding erosion. Some very impressive information in recent years concerning wind erosion has been captured by remote sensing techniques. These data have not only provided information about where the wind erosion occurred, but did a marvellous job of tracking the movement of the material. Therefore, remote sensing will play an important role in the LADA Project including the identification of hot spots and bright spots based on land cover change.

SUGGESTED INDICATORS FOR LAND DEGRADATION ASSESSMENT OF DRYLANDS

Snel and Bot (2003) and FAO (2003) have suggested indicators that might be used for assessing land degradation of the drylands. Snel and Bot (2003), as did Lane and Bunning (2003) state that the root causes of land degradation and desertification are often poverty and food insecurity. Snel and Bot (2003) go on to say the at the immediate causes of land degradation are inappropriate land use, degradation of soil, water and vegetation cover and loss of both soil and vegetative biological diversity, affecting ecosystem structure and functions. It is again important to recognize that land degradation is not limited to poverty and food insecurity because it also occurs widely in developed countries but it is fully recognized that the thrust of the LADA Project is on developing countries.

Snel and Bot (2003) suggest that an indicator should be achievable, measurable and recognize applicable data constraints. They propose that indicators should be SMART: specific, measurable, achievable, relevant, and time-bound. Indicators are proposed for assessing both soil and land degradation. They state that soil degradation lowers the actual or potential capacity of the soil to produce goods or services, while land degradation leads to a loss of intrinsic qualities required for particular land uses. They also point out (this is an important point that has not been sufficiently discussed in some of the other documents) that indicators should include evaluation of *on-site* effects of land degradation (e.g., decrease in soil fertility and soil productivity and in

turn crop yields and animal products) and *off-site* effects (e.g., soil sediment on downstream surface water).

FAO (2003) summarizes the 2003 E-mail conference and lists the potential indicators for use at four scales: global, national and regional, watershed or village, and farm. This is a crucial document because the indicators ultimately chosen will form the foundation for the LADA Project. It has been previously stressed that indicators should be SMART: Specific, measurable, achievable, relevant and time-bound. The loss of soil organic matter in cultivated dryland soils is the single most important factor because this leads to a serious decline in soil fertility and reduces the effective use of an already limited water supply making dry areas even drier. For rangelands, loss of ground cover is perhaps the most important single factor. Ground cover is listed as an indicator at the global level, but the others are not. The indicators listed in FAO (2003) are meant as a starting point for discussion, but the LADA list of indicators will need to be shortened and it should be determined whether or not they truly are SMART: specific, measurable, achievable, relevant and time-bound; they should also be checked against the DESERTLINK indicators.

APPLICATION OF AN ECOSYSTEM APPROACH TO DEGRADATION ASSESSMENT OF DRYLANDS IN ARGENTINA (WRI, 2004)

The study was conducted at the national level in **Argentina**. The study used a very broad approach based on Provisioning Services, Regulating Services, Cultural Services, and Supporting Services. The difficulty with such an approach again goes back to trying to develop an approach that answers all questions, and in the end does not answer any question. The premise of their approach is that ecosystems are essential for human well being. They identify human well being as having the necessary material for a good life, health, good social relations, security, and freedom and choice. These components are so site-specific that they seem meaningless in being a part of a global assessment. The report showed two trends that seem of vital importance — the decline of the sheep industry and the booming soybean production. However, neither of these major trends was really addressed in a quantitative way as to how land degradation, or soil degradation, was affected. Some references were quoted that related overgrazing to the sheep decline, but not in any quantitative manner over all the regions. A quantitative assessment, perhaps by expert opinion, of the condition of the grazing lands used for sheep production would be valuable, particularly comparing the degree of degradation as the lands become drier. In other words, are the grazing lands in areas with a P/PET ratio of 0.25 degraded much more severely than those in an area with a P/PET ratio of 0.5? If the decline in sheep production is due to economic conditions, the potential is there to recover when economic conditions change, or possibly change the enterprise. On the other hand, if the decline is due to land degradation, the potential may be severely damaged to the point that recovery is limited. Regarding soybean production, the real question that needs addressing is what effect, if any, this will have on soil degradation. Soybean production has gone from essentially zero in the late 1970s to more than 12 million hectares, about 35 percent of the total arable land. This has huge implications for fertilizer use and other factors that affect land degradation. A change of this magnitude in such a short time suggests the need for monitoring land quality changes to determine whether this is a change that can be sustained or if it is short-term exploitation that will result in land degradation. The current methodology does not seem to fully address these issues. Certainly, the short-term “well-being” will be improved, but the effect on land degradation, particularly soil degradation, will ultimately be the determining factor.

The study clearly recognized that the process of relating ecosystem change and human well-being is difficult because of the difficulty of documenting trade-offs and the current and

future dimensions of the relationships. The authors stated that overexploitation of ecosystems may initially lead to an increase in material well-being and a decrease in poverty with few obvious negative trade-offs. In the long term, however, this strategy may not lead to sustainable well-being. Thus, there is an element of prediction when trying to determine the impact of current trends on future well-being.

The indicators used in the Argentina ecosystem study are quite different from those suggested by the FAO (2003) report for the LADA Project.

II GLOBAL ASSESSMENT of LAND DEGRADATION (GLADA)

GLADA (version 0.1)

The only available global assessment of soil degradation to date is the UNEP–ISRIC GLASOD study carried out during the 1980s at a 1:5 million scale (published at a 1:10 million scale). The study has been extremely useful in indicating areas where specific types and intensities of soil degradation occur, but has also been criticized because of its subjective nature and its reliance on expert opinion only. Since then, more specific and objective studies were undertaken, notably the SOVEUR study for Central and Eastern Europe (FAO/ISRIC, 2000) and the ASSOD study for Southeast Asia (UNEP/ISRIC/FAO, 1998). Moreover, since then an important number of global terrain and other data have become available at ever increasing resolution, which may to a certain extent refine the findings of the GLASOD study. Although the LADA PDF-B phase did not foresee the production of a global overview of land degradation, efforts have been made to improve on the GLASOD study using more recent material readily available. The results have been compiled in Arc/Info format and a revised GLASOD (GLADA v0.1) map could now be produced by FAO. Information on the procedures followed and the algorithms used are contained in a specific website:

ftp://ftp.fao.org/agl/agll/lada/glada_project_status.pdf.

This preliminary update can be improved significantly. A first step would be to draw on the recently made available satellite images covering the globe for 1990 and 2000 (earlier data from 1978 may also be available). Using NDVI and other derived land cover information would provide essential components for the hot/bright spot analysis and for detecting major types of land degradation. In combination with the information collected over the years by WOCAT (<http://www.fao.org/ag/agl/agll/wocat/default.stm>) and the SOTER programme (<http://www.fao.org/landandwater/agll/soter.stm>), and supplemented by national ground observations and checking, this would provide an essential part of GLADA (which still would need incorporation of socio-economic indicators worldwide.). A proposal in this sense was prepared by ISRIC, which usefully could be associated with ongoing global land cover studies by JRC or EROS–UNEP.

GLASOD (web version: <http://www.fao.org/landandwater/agll/glasod/glasodmaps.jsp>)

This Beta version of a website gives access to soil degradation assessments by country based on the GLASOD survey carried out during the 1980's by UNEP and ISRIC. For the moment only maps and data for countries in the African continent are included, but these can easily be expanded to cover all countries of the world. Data on soil degradation have been linked with population numbers and densities in the mapping units. For each country the extent of each severity class of soil degradation and the associated population numbers (LandScan 2000) in the area mapped are given. More details on soil degradation assessments are included in the document below. More maps on the type and causes of soil degradation are available on the Terrastat CD-ROM (FAO 2003).

IMPORTANT:

The maps presented here are derived from regional maps at an original scale of 1:10 million and hence have a very low reliability, particularly in small countries. The estimates of the extents affected are very rough and should not be used as precise measured data. National authorities concerned with land degradation are urged to update and refine the present estimates and maps.

PHOTO LIBRARY OF EROSION PROCESSES

(http://www.fao.org/landandwater/agll/photolib/index_e.htm)

The proposed bilingual (English/French) photo library and its derived trilingual CD-ROM are designed as a complementary and technically annotated photography annex to the "[Guidelines for mapping and measurement of rainfall-induced erosion processes in the Mediterranean coastal areas](#)", as introduced in the following pages, as well as to the "[Guidelines for erosion and desertification control management with particular reference to Mediterranean coastal areas](#)" published in 2000.

The English version of the Mapping Guidelines was published in 1997 by UNEP/PAP in collaboration with FAO, and presented in a number of workshops in the Mediterranean region. The publication is available in English and French versions.

The implementation of this new erosion mapping approach and methodology has been the result of the urgent need for standardized and consolidated surveying tools in the region: so far, practices on mapping of erosion processes in the Mediterranean countries often involved a number of different and/or incompatible methodologies and procedures.

The mapping methodology is applicable not only for rainfall-induced erosion processes as initially stated, but considers also wind erosion and other degradation processes induced by incorrect land use practices and management. Similarly, the mapping criteria and methods probably are sufficiently flexible, adaptable and versatile to be applied in other regions of the world. Therefore, it seemed convenient not to limit the illustrating samples in the photo library strictly to Mediterranean coastal areas but to extend them to a broader variety of eco-geographic environments.

The photo library is a specific response to reiterated suggestions and recommendations of numerous professionals participants in several presentation and training workshops held in Spain, Malta and North African countries. The specialists and professionals all recognized the vital need, among various other types of environmental diagnosis, for both quantitative and qualitative assessments of natural resources degradation prior to the implementation of any erosion or desertification control programme. It was considered that the soil erosion maps improved by the proposed photo library could contribute to a far more accurate evaluation of the problems.

A direct link to PAP/RAC Erosion Mapping and Control Programmes is made available, which should facilitate the understanding and application of the proposed methodologies.

So far several practical surveying and mapping pilot studies have been completed within the framework of MAP-UNEP-PAP/RAC programmes in rather diversified Mediterranean environments (Spain, Turkey, Tunisia and lately Malta). Final products consisted of large-to medium-scale erosion maps covering geographically representative pilot areas. National technical reports referring both to the maps and the surveying areas are available in PAP/RAC headquarters.

III PILOT STUDIES (national and local assessments)

Three countries —Argentina, China and Senegal— were selected for conducting pilot studies. All three provided a national inventory of available information on land degradation and its assessment in the country. More detailed studies were undertaken in pilot areas. However, only Senegal has finalized this study to date. The Argentina study is still ongoing; the China one has focussed more on the development of participatory approaches rather than on technical issues. Results presented below are therefore still incomplete.

Argentina

The collection of all information and available experience on national land and water resources and on the land degradation status in the country in the form of a national report is already available on CD-ROM and in the Internet. This report contains the preliminary stratification rules and identification of the hot spots and bright spots, the quickly perceived state, cause and impact of the land degradation in the country. Biophysical as well as socio-economic information is available for Argentina, including:

- 1- Satellite imagery and aerial photographs of dry and drought areas
- 2- Native and cultivated forests
- 3- Soil quality
- 4- Energy resources
- 5- Land degradation data and maps
- 6- Climate
- 7- Cropping systems
- 8- Population density
- 9- Land tenure and related issues
- 10- Land use and management.

From a methodological point of view, it is important to mention the application of desertification indicators. Argentina has significantly advanced in the implementation of the requests made by the Science and Technique Committee (CST) of the UNCCD within the subject of benchmarks and indicators of desertification. Argentina has been applying this methodology long before the implementation of the convention on this matter.

A workshop was organized by the LADA–Argentina focal point (The Secretariat of the Environment and Sustainable Development) supported by FAO. The meeting was held in Buenos Aires, May 12–17 2002, to bring together farmers, advisers, scientists, and private sector and decision makers to establish a National LADA Task Force, to elaborate the detailed work programme and budget and to select pilot areas for local assessment.

About 42 people from 25 institutions and representing 9 provinces have participated in the Workshop. There were also representatives of the following International Organizations: CCD-Global Mechanism, GTZ, FAO and World Resource Institute.

The meeting allowed the review of the Argentina Stocktaking report (step 1) on the land degradation assessment experiences in Argentina and a specific report on the goods and services that are affected by land degradation, with special emphasis on the economic, environmental and social impacts.

This allowed an inventory and prioritization of perceived problems linked to land degradation and an estimate of their economic, environmental and social impacts (Step 3). The users' needs were also identified and the main output was the establishment of a National Land Degradation Task Force, involving representatives of all concerned stakeholders, existing networks and technicians. The responsibilities of the LADA Task Force were defined including a detailed work programme and budget to accomplish Steps 4 to 7 at selected pilot sites and national level.

The work plan to achieve the LADA methodology will be executed in a period of ten months divided in two phases of five month each at national level and in four selected pilot areas under the coordination of the Secretariat of the Environment and Sustainable Development supported by a technical advisory committee.

At national level the stratification and sampling methodologies will be defined, the pilot areas selected and the working arrangements will be set up, including the distribution of labour, the detailed plans and time table and the active involvement of all the parties concerned. Progress of the teams at local level will be reviewed periodically and jointly, not only in terms of advances in the programme execution but also as regards their substantive advances (interim assessments) in the identification and understanding of the problems, their causes and impacts, so as to adjust and coordinate further work and focus on existing gaps.

At local level hot and bright spots will be selected within the same agro-ecological and socio-economic conditions (four cases in total) in order to facilitate the extrapolation of the results to other similar areas.

The research agreement with the World Resources Institute (WRI) provided guidance to the FAO/LADA project on the ecosystem approach and its usefulness as a conceptual framework for a global assessment of the world's drylands. Using an ecosystem approach would allow a better evaluation of the capacity of drylands to provide goods and services important for human development.

The primary focus of the WRI/FAO research agreement is to:

- Develop an analytical framework and guidelines for the application of an ecosystem approach to evaluate drylands conditions at the national level;
- Compile relevant data to develop selected examples of ecosystem indicators for key dryland goods and services; examples will be from Argentina and other dryland countries.

The Argentina report, the outcome of the LADA Task Force workshop and the detailed work plan can be consulted in the following web pages:

<http://www.medioambiente.gov.ar/suelo/programas/lada/default.htm> and

<http://www.fao.org/ag/agl/agll/lada/arg/inicio.htm>.

China

An FAO mission visited the Peoples' Republic of China to assist the National Bureau to Combat Desertification (NBCD), State Forestry Administration (SFA), Beijing, with the piloting of the Land Degradation Assessment in Drylands (LADA) approach within the country. The main aim of the mission was to assist the Chinese National LADA Task Force (NLTF) with the convening of the first Chinese LADA Local Level Stakeholder Consultation/Training Workshop.

The workshop was held in Yan Chi county, Ningxia-hui Autonomous Region, 7–10 April 2003. Prior to the workshop the mission was involved in a series of planning meetings with members of the Chinese national LADA Task Force in Beijing to: (i) review the administrative arrangements for the workshop; and (ii) to advise on the methods to be used to facilitate both the group and plenary discussion sessions. Both prior and post workshop the mission had meetings in Beijing with representatives of FAOR, UNESCO and ADB.

The following steps have been implemented by China in response to the LADA guideline:

LADA Steps	Progress and Activities Undertaken to date
Step 1: Identification of land degradation problems and	China has been an active participant in the LADA programme from the beginning, and has made presentations on China's experience with land degradation assessment at the January and November 2002 LADA workshops. The draft Report of Land Degradation Assessment for the Arid Land

problems and user needs assessment	Areas in China provides a broad overview of the dryland areas of China, according to both the Chinese and UNCCD definitions of dryland (arid, semiarid and dry subhumid) areas. In addition to providing details on the nature, extent and causes of dryland degradation within the PRC, the paper also describes the current strategic policies, legislative instruments, institutional arrangements and national programmes for desertification control.
Step 2: Establishment of a National LADA Task Force	A national LADA Task Force has been set up, under the chairmanship of Professor Yang Weixi, Chief Engineer NBCD. To date the national Task Force has conducted two half day national stakeholder consultation meetings. In total twenty technical specialists were involved. They were drawn from a range of SFA departments and other government and academic institutions with expertise covering the fields of desertification control, desertification monitoring and assessment, meteorology, rangeland management, soil and water conservation, soils and fertilizer, geography and desert ecology.
Step 3: Stocktaking and preliminary analysis	Limited socio-economic and bio-physical data compilation has been undertaken so far specifically for LADA. However much secondary data, of relevance to land degradation assessment, is known to exist at the national, provincial and local government levels. In particular data on the type and extent of dryland degradation has been gathered by the 2 national desertification monitoring surveys conducted to date (in 1994 and 1999) using a combination of satellite imagery and field investigations.
Step 4: Stratification and sampling strategy	The National LADA Task Force have identified the following six counties/banners as representative sample areas in which to undertake pilot land degradation assessment surveys: ! Yanchi County, Ningxia-hui Autonomous Region ! Wulan'aodu Banner, Inner Mongolia Autonomous Region ! Minqin County, Gansu Province ! Fengning County, Hebei Province ! Otog Qi Banner, Inner Mongolia Autonomous Region ! Zhenglanqi Banner, Inner Mongolia Autonomous Region
Step 5: Field surveys and participatory local assessments	A local level LADA stakeholder consultation/training workshop was held, 7-10 April 2003, in Yanchi County, Ningxia-hui Autonomous Region. The workshop participants included: a) representatives from each of the six proposed pilot assessment study areas; and b) experts from the key national technical agencies that would assist with individual pilot assessments. The participants were introduced to the LADA global programme, the LADA DPSIR assessment framework and the steps involved in the pilot assessments. Similarities and differences between the 6 pilot areas were reviewed, and there was an initial discussion on: a) the causes (driving forces and pressures) of dryland degradation in China; b) the ecological and socio-economic consequences (impact); and c) alternative ecological and socio-economic indicators that could be used for the local level assessments. A review of the existing local level capacity to undertake the pilot assessments revealed not only a need for training but also additional equipment and financial resources. In response to this an outline project proposal has been drafted detailing the resource requirements for undertaking the local level pilot assessment studies.
Step 6: Development of land policy decision	With the assistance of the two FAO LADA missions, a start has been made on identifying those national, provincial and local government policies and desertification control programmes that could potentially use the results of the pilot assessments to review and refine their implementation.

models and dissemination of results	
Step 7: Monitoring strategies and tools	No activities to date.

Senegal

The institutional focal point is the Centre de Suivie Ecologique that will initial the LADA pilot studies. This institute has established an interactive network with other institutions and stakeholders in the country. The first aim is to alert the local authorities and the stakeholders of the problems related to land degradation. The project has prepared a report of about 30 pages that contains:

1. The identification of potential LADA partners that form the kernel of the LADA national task force with names and addresses and possible function and expertise.
2. A user study of stakeholders defining prime needs with regard to information products and decision support tools directly related to assessing and combating desertification. This survey will be carried out by selecting a representative sample of public sector actors (technicians, decision makers at every level), international organizations and funding agencies, private sector representatives and NGO's directly involved with rural development and agriculture (unions, professional associations etc.). The desired products will be defined as well for their content as for their format, access mode and distribution mode. This study will present a first step for a more detailed study under the full LADA project.
3. A general study of goods and services affected by desertification at national and sub national level, taking into account the findings of the NAP of the UNCCD.
4. More general strategic considerations on how to implement LADA in the country and in Western Africa in general at the institutional level (distribution of responsibilities, activities, operations, coordination and quality control).

The participating institutions have established a base for the harmonized collection of data related to indicators of pressure state, impact and response at the different levels by particularly using Remote Sensing techniques and Geographical Information Systems. This set-up will be tested in three or four pilot areas that are characteristic for the desertification situation of Senegal. Pilot areas should be sufficiently large to enable methodological recommendations be made at national level (in the order of 10 000 sq. km each). The results will include recommendations on sampling size, data collection, stratification and an analysis of hot spots and bright spots. The provisional LADA guidelines and the LADA Remote Sensing approach will be followed. All results including a benefit/cost analysis for each method will be documented in a report with a database and CD-ROM. Particular attention is paid to the following:

- A land use map and a historical trend of land use
- A holistic analysis of landscapes
- A climatic analysis and an analysis of NDVI
- Experimental remotely sensed indicators (ex: SMI, NPP, derived models).

A preliminary analysis within the DPSIR framework has been undertaken with the identification of the location, type and major causes of land degradation their impact and trends and the possibility to follow the evolution by remote sensing.

The capacity of local experts to work in multidisciplinary teams has been strengthened.

A national LADA website has still to be established. It will contain all relevant information to efforts combating desertification in the country and linked to the Central LADA Information Platform at FAO.

In addition, three regional workshops were held in which a total of 51 countries presented national reports on land degradation. The proceedings are in preparation (the one for Africa is available, the one for the Caribbean is being finalized, the one for Asia is in draft stage). All will appear as World Soil Resources Reports in 2004.

CASE STUDIES (local assessments)

In addition to the Pilot Studies, several case studies were conducted. The case studies conducted in Mexico, South Africa, Uzbekistan, Kenya, Egypt and Malaysia are briefly reviewed below.

Mexico Case Study

This was an extensive study of two sites – Salinas, San Luis Potosi (4445 hectares) and Las Casitas, Pueblo (3100 hectares). The study was an attempt to use the Driving Forces-Pressures-State-Impacts-Responses (DPSIR) paradigm. This study was conducted well and nicely reported. It was implemented in six well-defined and logical steps:

1. Definition of the target areas
2. Zoning and stratification of such areas
3. Application of a sampling scheme
4. Performance of land degradation assessments based on field indicators and farmer participation in the auto-diagnosis of degradation problems
5. Integration of results, mapping degradation and identifying causality.
6. Integration of the analysis of impacts (I) and responses (R) from the socio-economic assessment and the participatory soil diagnosis.

The complexity of this study was overwhelming. The study clearly took into account the physical processes as well as the social, cultural, political and economic issues related to land degradation. However, so many indicators were considered that it was difficult, if not impossible, to analyse and interpret the results. This became particularly complex when trying to combine many of these indicators into a map. Although this study was well conducted and well summarized, it clearly illustrates that the approach would not be practical and manageable for making assessments on a country or global basis.

This study should be carefully analysed by the LADA Committee because it really did follow in principle the guidelines proposed.

South Africa Case Study

The extent of this study was limited and focused primarily on salinity problems. The paper is more of a review of land problems rather than a detailed report of a study. However, the paper provides a good snapshot of some of the major soil problems in South Africa. The maps generated for salt-affected areas provide good examples of how information can be effectively provided to decision makers. The paper also did an excellent job highlighting the importance of soil organic matter and how the decline of soil organic matter is accelerating salinity problems as well as fertility problems. An estimated 20 percent of the country's total surface area is potentially highly erodible. The authors estimate more than half of South Africa's surface area is under threat of desertification and that although the process can be reversed, it will be a slow process requiring considerable inputs. Although this study was limited, it does indicate a good

understanding of the problem and lays out a basic framework that can be used to assess soil degradation but there was little or no attention given to the social and political drivers associated with land degradation.

Uzbekistan Case Study

The Uzbekistan study contains excellent information and although it focuses on salinity in the map presentations, information is also available for producing other degradation maps. However, essentially all of the agricultural land in Uzbekistan is irrigated.

The authors identified the important land degradation processes in Uzbekistan as 1) secondary salinization or irrigated lands; 2) flooding and water-logging of irrigated lands; 3) loss of organic matter and increase of fertility decline in soils; 4) widespread occurrence of irrigation erosion of irrigated soils; 5), soil pollution; and 6) aerosol transport of salt and dust from the dry bed of the Aral sea. They concluded that land degradation trends pose a serious hazard to food security, health and safety of the people located in the drylands.

There is sufficient information available to produce with some additional effort – particularly expert opinion analyses– maps showing the most vulnerable areas with particular degradation problems. These would be extremely useful to decision makers regarding allocation of resources. Although they would focus on soil degradation processes, they would have major uses in the analysis of social and economic issues and should be of interest and value to decision makers. Similar data for other countries are also available, because most of the data used in the Uzbekistan Case Study were extracted from the FAO database.

Kenya Case Study

More than 80 percent of the lands in Kenya are drylands and about 75 percent of the country receives less than 500 mm rainfall annually; the PET is about 2000 mm per year. The irrigation areas are mostly in arid regions but amount to only 84 000 ha, although the estimated potential irrigated area is between 244 700 and 539 000 ha. The study focused on saline and sodic lands but other degradation processes of great importance in Kenya include fertility decline, soil acidification and aluminium toxicity, organic matter decline, wind and water erosion and soil compaction. The case study was not very detailed but did indicate that there is perhaps adequate expertise and data available to assess land degradation.

The authors pointed out that the semiarid and arid lands of Kenya are communally owned and most of these areas receive large numbers of immigrants who often settle indefinitely provided that there is sufficient pasture and water. This leads to uncontrolled use and degradation of the land. In a system where usage rights are restricted, as with certain groups/communities in agro-pastoral areas, land degradation is less severe. Most studies on land degradation in the past have approached land degradation from the viewpoints of climate and vegetation, ignoring the socio-economic factors, which contribute both to causes and to solutions. One of the strong points of the LADA Project, but also one of the challenges, is the integration of the physical factors of land degradation along with the social, economic, and political factors.

Egypt Case Study

The land in Egypt is nearly all desert and therefore contains little or no land classified as arid, semiarid, or dry subhumid that make up the drylands. However, irrigated lands in desert areas do come under the umbrella of LADA. Agriculture in Egypt is nearly completely irrigated because nearly all of the area receives less than 200 mm of precipitation annually and the potential evapotranspiration rates are very high. Land degradation does occur in Egypt but it is not widespread. Yet, irrigated agriculture has been practiced in the area since the earliest times. Population density is high and the number of people has increased from 11 million in 1907 to 65

million in 2000 and continues to increase in 2002 at the rate of 1.69 percent per year. This clearly shows that land quality can be sustained for centuries regardless of the population density. Sustainability is usually determined by management and inputs and not by population pressure and climate even though the difficulty of maintaining sustainable systems is certainly influenced by climate and population pressure. Egyptian lands have for the most part remained productive because of irrigation and other inputs.

The major land degradation problems in Egypt have centred on hydrological constraints such as water-logging, salinity and sodicity; physical constraints such as deterioration of soil structure and compaction; and biological constraints caused by a decline in soil organic matter leading to declining soil fertility. Soil erosion by wind has also been a concern. Soil erosion, particularly wind erosion, becomes worse in wind-prone areas with decreasing soil organic matter levels because soil organic matter serves as glue that holds soil particles together. As soil organic matter is lost, the particles become separated and are then highly susceptible to movement by wind.

The participants in this study also discussed the importance of soil organic matter on alleviating saline and sodic problems. They showed that incorporating organic matter into soil has two principal beneficial effects on saline and sodic soils: improvement of soil permeability, and decomposition of certain organic acids and release of carbon dioxide.

Again, this study focused more on the physical factors with little or no emphasis on social, economic and political factors.

Malaysia Case Study

The Malaysia report also focuses on salt-affected soils. The report is well written but is more of a review article than a study report. It gives an interesting and factual description of agriculture in Malaysia and describes some of the salinity problems. Soil erosion, fertility depletion, salinization, water-logging and the lowering of the ground water table have also been recognized as important land degradation problems in Malaysia.

V Information products and Websites created

The information products include in the first place the **LADA Brochure**, which was produced in four languages (English, French, Spanish and Arabic) and was distributed at various international gatherings and meetings. Another main product was the creation of the **LADA Virtual Centre** (<http://lada.virtualcentre.org/pagedisplay/display.asp>), containing basic information on the LADA project in addition to basic documents produced by the project and more than seven hundred publications searchable by subject and region. In addition the centre allows for incorporation of national websites linked in a network. The latter feature needs further testing and the search engine needs to be improved. There is also a separate **AGL LADA website** (<http://www.fao.org/ag/agl/agll/lada/default.stm>), which includes information on the E-mail conference held and on products under development (such as GLADA). A CD-ROM containing 700 MB of information related to desertification and links to relevant websites is under development.

VI Conclusions and Recommendations

Conclusions

1. Under this LADA phase a methodological approach has been developed that proceeds in seven stages, is country-focussed and includes a number of local assessments. Apart from this, a preliminary global land degradation assessment has also been undertaken.
2. Nearly 60 countries have produced a national overview of the status, causes and impacts of land degradation in more or less detail.
3. Three pilot countries (Argentina, China and Senegal) have tested part or whole of the LADA approach. Independently, but with support of the LADA project, Mexico has tested a very similar approach.
4. A number of websites and information documents have been produced that have given LADA a high visibility within the international community and have raised high expectations for the LADA brief

Recommendations

Technical Aspects of the LADA Methodology

The seven-step approach was tested and found robust and adaptable in all countries where it has been applied; it is recommended for wider application.

National and Local Implementation

It is recommended that flexibility in the selection of technical approaches is granted to countries implementing LADA. There is no point in designing a strict methodology with a fixed number of indicators or sampling designs. Therefore an enhanced DESERTLINK approach is recommended, which would allow working within a DPSIR, a Five-Capitals or a Livelihood approach for local assessments.

Nevertheless a number of important steps should preferably remain common, including:

1. An identification of major impact areas of land degradation in drylands of countries based on a combination of farming systems and type of dryland (P/PET or AEZ), population affected, and the actual state or trend of degradation. In practice countries are well aware of the priority areas concerned.
2. A hot spot/bright spot analysis based on land cover changes (NDVI, climatic analysis) including a historical analysis.
3. A sampling design that preferably should be reasoned rather than random including information on soils and terrain (SOTER) and the areas identified under item 1 above.
4. An indicator system originally based on the example worked out by DESERTLINK but adapted to local conditions and including biodiversity concerns and indicators as suggested by Lane and Bunning). The ecosystem approach has produced less satisfactory results.
5. A local assessment that takes into account socio-economic indicators that can be *extrapolated to the whole country*. The approach itself to gather these may vary from country to country (for example, RRA, Livelihood approach).
6. The use of the visual soil assessment techniques in local assessments is recommended, preferably in conjunction with farmer field schools.
7. A flexible integration of socio-economic and biophysical parameters using for instance the statistical mollifier method or the more general DPSIR approach. The most important aspect

of this integration is that sound decisions can be made on how wisely to rehabilitate degraded land

8. Each participating country to become part of a regional/global LADA network, allowing exchange of experiences.

Global Land Degradation Assessment

In the short term the steps undertaken under GLADA could be continued and refined, but should be complemented with a more land cover/field checks based approach. In the long run a LADA mechanism should be established that allows feedback from global to local and vice versa, enhancing the quality of both the national (and local) and the global assessments.

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ANNEX H: MONITORING AND EVALUATION PLAN

INTRODUCTION

The objective of monitoring and evaluation is to assist all project participants in assessing project performance and impact, with a view to maximizing both. Monitoring is the continuous or periodic review and surveillance by management of the implementation of an activity to ensure that all required actions are proceeding according to plan. Evaluation is a process for determining systematically and objectively the relevance, efficiency, effectiveness and impact of the activities in light of their objectives. Ongoing evaluation is the analysis, during the implementation phase, of continuing relevance, efficiency and effectiveness and the present and likely future outputs, effects and impact.

The general and specific objectives of the project, and the list of its planned outputs, have provided the basis for this M&E plan. The specific objectives are to: (a) develop and implement strategies, methods and tools to assess, quantify and analyse the nature, extent, severity and impacts of land degradation on ecosystems, watersheds and river basins, and carbon storage in drylands at a range of spatial and temporal scale; (b) build national, regional and global assessment capacities to enable the design, planning and implementation of interventions to mitigate land degradation and establish sustainable land use and management practices.

The project will be evaluated on the basis of:

1. **Execution performance.** Monitoring will concentrate on the management and supervision of project activities, seeking to increase the efficiency and effectiveness of project implementation. It is a continuous process, which will collect information about the execution of activities programmed in the workplan (Annex D), advise on improvements in method and performance, and compare accomplished with programmed tasks. This activity will be the direct responsibility of the Project Co-ordinator working under the supervision of the Project Manager, and under the overall supervision of the *LADA* Task Force and Management Team at FAO. See Table 3.1 for the execution performance indicators.
2. **Delivered outputs.** Ongoing evaluation will assess the project's success in producing each of the programmed outputs, both in quantity and quality. Internal assessment will be continuously provided by the Project Co-ordinator under the supervision of the Project Manager at FAO, and mid-term and final evaluations of outputs will be carried out by external consultants contracted by UNEP in consultation with FAO [and by consultants contracted by the Scientific Committee). See Table 3.2 for a summary of expected outputs by project objectives, and Annex B for a detailed list of project activities and corresponding outputs.
3. **Project performance.** Performance evaluation will assess the project's success in achieving the third of its objectives (above). Monitored internally through reports and meetings, especially of the *LADA* Task Force and Management Team at FAO, and by the Project Steering Committee (SC), success will be evaluated at mid-term (after two years of project execution) and final (at the end of project execution) by external consultants contracted by UNEP in consultation with FAO. See Table 3.3 for a summary of the project performance indicators.
4. **Project impact.** Two major areas have been identified for impact assessment, namely: i/ development of standardised and improved methods for dryland degradation assessment and ii/ provision of best practice guidelines for dryland degradation assessment that will be disseminated widely. Impact assessment in these two areas will depend upon the phases and milestones of the project. The tools, methods and indicators for measuring impact will be determined during an initial methodology workshop to ensure that a standardized framework is shared by all involved countries.

The rest of the presentation is in tabular form, as set out below:

Table 3.1 lists the indicators of project execution performance.

Table 3.2 describes inputs and expected outputs and their timings. See also the Activity Plan, Annex D.

Table 3.3 summarizes indicators of project performance.

Table 3.4 distinguishes the monitoring and evaluation responsibilities respectively of UNEP, FAO (*LADA* Task Force and Management Team), The Scientific Committee, Project Steering Committee and Regional Focal Country Nodes.

Table 3.5 sets out the monitoring and evaluation reports, their content, timing and responsibility.

Table 3.6 sets out the principal reports by area of activity, expected date, and drafting responsibility.

Further detail on stakeholder involvement, and on dissemination of information to a wider public, is provided in Annex E.

Table 3.1 Indicators of project execution performance

- *LADA* Task Force and Management Team at FAO are functioning efficiently, and are served by effective scientific advisors.
- The Task Force and the Scientific Committee is tracking implementation progress and project impact, and providing guidance on annual workplans.
- The Steering Committee is providing policy guidance, especially on achievement of project impact.
- Half-yearly and annual activity and progress reports are prepared in a timely and satisfactory manner.
- Half-yearly disbursement plans and half-year and annual financial reports are prepared in a timely and satisfactory manner.
- Performance targets are achieved as specified in the annual operating plan.
- Deviations from the annual operating plan are corrected promptly and appropriately.
- Disbursements are made on a timely basis, and procurement is achieved according to the procurement plan.
- Audit reports and other reviews show sound financial practices.

Table 3.2 Description and timing of expected outputs by project objectives

(SEE ANNEX D: WORKPLAN AND TIMETABLE; ‘BEGUN’ MEANS WORK COMMENCED DURING THE PREPARATORY PHASE)

[Must be read together with country implementation plans – will be completed as soon as received from countries](#)

Objectives and inputs	Outputs	Start	Finish	Outcomes
1.	See prodoc			
2.	See prodoc			
3.	See prodoc			
4.	See prodoc			
.				

Table 3.3 Indicators of project performance

(SEE ALSO ANNEX B)

Indicators of improved needs-based and process-driven approach to dryland degradation assessment

- Reviews of existing work completed and lessons drawn
- An information system designed and tested
- Information system is integrated into national planning and used to identify critical areas in the six pilot participating countries.
- An improved needs-based and process-driven approach to dryland degradation assessment accepted by participating countries

Indicators of baseline ecosystem (or sub-regional) and global assessments of land degradation for drylands undertaken and presented

- Baseline data collated and accessible on a user-friendly platform
- Baseline maps produced and widely available to for eco-regions and areas represented by participating countries
- Nationally agreed lists of ‘hot spots’ and ‘bright spots’ identified, described and widely available.

Indicators of detailed local assessments and analyses of land degradation and its impact in areas of especial environmental and socio-economic risks (‘hot spots’) and areas where degradation is controlled (‘bright spots’) undertaken, and through an information system, linked to policy at national level.

- Relevant professional training and capacity building in detailed assessments and analyses undertaken
- The needs of users of land degradation assessment and the operation of national-level integrated information system understood in all participating countries
- Six pilot national assessments completed and evaluated for scaling up.
- An integrated information system is in place in the six pilot countries providing relevant data on land degradation for policy, planning and control interventions

Indicators of promoting action and decision-making for the control and prevention of land degradation in drylands using *LADA* products and networks.

- A generic framework for the analysis of critical components in land degradation designed and demonstrated
- Success narratives of land degradation control and prevention analysed and presented
- Contribution of *LADA* to policy guidance at international, regional and national levels being demonstrated

- *LADA* Scientists actively involved in UNCCD RAP, SRAP and NAP further development and implementation support
- *LADA* scientists actively assisting implementation of GEF OPs
- International partners in *LADA* fully engaged with *LADA* approach and at least three additional countries using *LADA* outputs

Table 3.4 Monitoring and evaluation responsibilities

	FAO (Task Force and Management Team)	Scientific Committee	Steering Committee	Regional Focal Country Nodes
Monitor the agreed M&E plan in accordance with the terms of agreement with GEFSEC	Establish reporting guidelines for country leaders, and ensure that they meet reporting dates and provide reports of suitable quality	Receive half-yearly activity and progress reports, sub-regional coordinators' / advisors' reports, and all substantive reports from countries; and as a 'peer-review' group use them to annually review the progress of work in the project as a whole	Receive consolidated half-yearly activity and annual progress reports, and all substantive reports, and provide policy guidance to the project on any matters arising from a reading of these reports	Supply continuing M & E data as requested by FAO
Receive consolidated half-yearly and annual activity, progress and financial reports and copies of all substantive reports, from FAO	Review and comment on half-yearly and annual activity and progress reports, sub-regional coordinators' / advisers' reports, and all substantive reports submitted by countries	Advise FAO (Task Force & Management Team) on implementation problems that emerge, and on desirable modifications to the workplan for the succeeding year	Assist the FAO (Task Force) and Scientific Committee in developing linkages with other projects, thus ensuring the wider impact of project work	Assist FAO in carrying out special reviews
Task manager or deputy to attend and participate fully in general project meetings, and meetings of the Scientific Committee and SC	Prepare consolidated half-yearly progress reports and annual summaries for UNEP, and forward substantive and financial reports, with comment as appropriate, in a timely manner to UNEP	In particular, review progress and any problems in relations with stakeholders, affecting success in project impact	Provide overall guidance for the project implementation	Agree Impact indicators at regional, and national level
Engage and prepare terms of reference for independent M&E consultants to conduct the mid-term reviews and final evaluation	Carry out a programme of regular visits to countries to supervise activities, and pay special attention to those countries with serious implementation problems	Advise FAO on the appointment of internal STAT teams or recruitment of external scientific advisers, and on the need for specialized training courses		Submit agreed Indicators to FAO/M & E Unit
Facilitate the selective review of the project by STAP and/or GEFSEC	Establish terms of reference for any scientific advisers (or internal STAT teams) to be engaged as consultants to advise on particular areas of expertise, and/or provide specialized training for participants. Receive and evaluate the reports of these advisers, and act on any problems noted within them	Monitor progress in the capacity-building programme of the project, and advise FAO (Task Force and Management Team) on steps to enhance this programme		
Carry out such other monitoring as is determined in collaboration with FAO (Task Force and Management Team)				

Table 3.5 Monitoring and evaluation reports

This refers to the 6-monthly administrative and financial reporting, with a fixed format to be respected by coordinators at the national and global levels, i.e. from country to FAO and from FAO to UNEP (see annexes 6a and 6b pp. 19-20). FAO financing rules (justification of at least 75% of expenses) will be applied to all reports.

Report	Format and Content	Timing	Responsibility
Activity and Progress Reports	(Reports will use a standard format to be developed following the UNEP Progress Report model)		
Document the completion of planned activities, and describe progress in relation to the annual operating plan	Person reporting and Date Activity name and accomplishments within each activity this half-year	Half-yearly	Country coordinators to FAO (Project Co-ordinator) for use as described in Table 3.4 (above)
Review any problems or decisions with an impact on performance	Targets for the next half-year Comment on performance on progress toward project goals, and problems/constraints		
Provide adequate substantive data on methods and outcomes for inclusion in consolidated project half-yearly and annual progress reports	Report on any unanticipated results and opportunities, and on any checks to project progress Any highlights		
The Project Implementation Review (PIR) reports		Yearly	UNEP Task Manager / DGEF to GEF Secretariat
Consolidated Half-yearly Progress Reports	(Reports will use a standard format to be developed following the UNEP Progress Report model)		
Provide a summary of half-yearly reports of progress, for UNEP monitoring and transmission	Summary of Country Coordinators' reports and participating institutions Report on progress in each project activity, within each Country and in the project as a whole Activities of scientific advisers and specialized training programmes Summary of problems and proposed action Highlights	Half-yearly, within 30 days of end of each reporting period, but not required where a Consolidated Annual Summary Report is due	FAO (Project Co-ordinator) with input from National/ regional Coordinators for forwarding to UNEP and [Scientific Committee] and Steering Committee
Consolidated Annual Summary Progress reports	(Reports will use a standard format to be developed following the UNEP Progress Report model)		
Presents a consolidated summary review of progress in the project as a whole, in each of its activities and in each output	A consolidated summary of the half-yearly reports, with evaluation Summary of progress and of all project activities	Yearly, within 45 days of end of the reporting period	FAO (Project Co-ordinator) [with Scientific Committee] forwarding to UNEP and Steering committee
Provides summary review and assessment of progress under each activity set out in the annual workplan, highlighting significant results and progress toward achievement of the overall	Description of progress under each activity and in each output Review of delays and problems, and of action proposed to deal with these Review of plans for the following		

work programme	period, with report on progress under each heading		
Provides a general source of information, used in all general project reporting			
Financial reports	(Standardized format to be developed compatible with UNEP form in Annexes 4, 5a and 5b)		
Details project expenses and disbursements	Disbursements and expenses in categories and format as set out by the FAO (Financial Officer), together with supporting documents	Half-yearly	All contracted institutions, to FAO (Project Co-ordinator)
Summary financial reports	(Standardized format, see Annex 4, 5a and 5b)		
Consolidates information on project expenses and disbursements	Disbursements and expenses by category. Requirement for coming period [Annexe 5a]	Half-yearly, within 30 days of end of period	FAO Financial Officer, for forwarding to UNEP
Financial audits			
Annual audit by an audi/UN Board of External Auditors	Audit of FAO accounts for project management and expenditures	Annual	FAO

Table 3.6 Principal Reports by title, number, timing and responsibility. This refers to the technical/scientific reporting. The FAO Project Manager for *LADA* will provide a standardized format for technical/scientific reporting as soon as possible after the initial methodology workshop. Any additional scientific publication or related disseminated material must be attached to the national reports. For results dissemination and utilization, refer to the draft plan in annex 2.

Report, number and title	Format and Content	Expected date	Responsibility
Reports on particular aspects as listed in the workplan, annex 2	Content will follow guidelines provided by FAO (<i>LADA</i> Task Force and Scientific Committee). There will be no standardised format.	Periodic. Expected dates as below	National Co-ordinators to FAO (Project Co-ordinator) . Consolidated project-wide reports by the FAO (Project Co-ordinator) will follow certain reports, for forwarding to UNEP and SC 3 months after submission of from countries)