



International Workshop **GEF Land Degradation Focal Area Indicators**

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Mexico Room (D-Building, D 211)
Chair: Andrea Kutter (GEF Sec), Rapporteur: Caroline King (UNU)

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Introduction to the Workshop and Opening Session

The International Workshop on Global Environment Facility (GEF) Land Degradation (LD) Focal Area (FA) Indicators was organized by the GEF Secretariat (GEFSEC), and hosted by the Food and Agriculture Organization (FAO) of the United Nations (UN). The workshop was attended by members of the GEF Task Force (TF) on Land Degradation; the GEF Scientific Technical Advisory Committee (STAP); representatives of the UNCCD Secretariat and Group of Experts; and a group of independent experts. This workshop was organized to serve the strategic planning needs of the GEF LD Focal Area, as well as a pre-cursor to a Medium-Sized Project (MSP), entitled 'Ensuring impacts from SLM - Development of a Global Indicator System.'

Alexander Müller, Assistant Director-General for the Natural Resources Management Department, FAO, welcomed participants to the workshop. Dr. Müller commented on the pressing nature of the global challenge to address the loss of ecosystem services through improved knowledge management. In this regard, Dr. Müller affirmed the need for synergies between agencies and projects, such as the planned interagency initiative on knowledge management, entitled 'Ensuring impacts from SLM - Development of a Global Indicator System', and highlighted this opportunity for collaboration with FAO's project on Land Degradation Assessment in Drylands (LADA), and with the FAO's own in-house knowledge management unit.

Andrea Kutter (GEFSEC) welcomed participants to the workshop on behalf of the GEF family, and thanked FAO for its help and support to organize the meeting. Ms Kutter reflected on the allocation of funding to the LD FA since its creation by the GEF Assembly in 2002, observing that there is a need to demonstrate the Global Environmental Benefits (GEB) that can be achieved in the LD Focal Area in order to justify further allocation of funds. Measurable indicators of the benefits achieved as impacts from GEF LD projects are needed in order to demonstrate results to the GEF Council and its member Countries. The GEF continues to focus on the progress, performance and impact of all interventions under the leadership of its Chief Executive Officer, Mme Monique Barbut. Ms Kutter observed that such indicators should be formulated to be meaningful and scientifically valid, as well as relevant to stakeholders' needs. In this regard, the current workshop was designed to bring together a variety of institutions, knowledge and expertise, to comment on the development of the initiative on indicators. Ms Kutter thanked the assembled experts in advance for their contributions based on eminent scientific opinion and relevant experiences in indicator development, and looked forward to the continuation of the initiative through subsequent meetings.

Overview of the Workshop and its Objectives

Zafar Adeel, Director, United Nations University International Network on Water, Environment and Health (UNU-INWEH), presented an overview of the workshop objectives and modus operandi. The workshop set out to address the need for indicators in the GEF LD FA in the following ways:

- Discuss and review a framework that has been developed with the GEF LD TF for the selection of indicators of Sustainable Land Management (SLM) in the LD FA;
- Provide expert feedback for indicator selection:
 - Overview of available and ongoing indicator databases
 - Review indicator selection criteria
 - Consider the process for indicator selection;
- Identify potential partners in a Learning Network to support ongoing knowledge management, including the selection and use of indicators;
- Identify experts to collaborate in project implementation.

The first day of the workshop was dedicated to a series of presentations and conceptual discussions focusing on the challenges for the evaluation of Sustainable Land Management (SLM) initiatives, and their impacts on land degradation. The second day of the workshop brought together a range of perspectives on indicator development initiatives for the purposes of information sharing and discussion of recommendations for the future GEF initiative.

In his overview of the conceptual discussion of the workshop focus, Dr. Adeel observed that the discussions would be of relevance to policy-makers and scientists beyond the GEF realm, and that the broad participation by experts reflected their interest in the tools and frameworks to be developed. He expressed the hope that these tools would help countries to understand the costs of LD, as well as the benefits of early intervention. Significant challenges would include the definition of GEB to be measured at the global level. These concepts should then be translated into reliable and consistent indicators to be used across different scales of time and space within projects, within a coherent framework for synthesizing and sharing information across the GEF portfolio.

Dr. Adeel gave a brief overview of the new GEF LD FA Knowledge Management initiative, including the development of indicators, establishment of a Learning Network and eventual measurement of results at project and program levels. The GEF project 'Ensuring impacts from SLM - Development of a Global Indicator System'¹, when it becomes operational, will be the first phase in this initiative. The current workshop, preceding the start of the MSP, would enable the consultation of assembled experts on the preparations for the project, and would introduce an informal network to support its implementation through collaboration and exchange with ongoing indicator-related initiatives.

Gregoire de Kalbermatten indicated strong support for the initiative on behalf of the UNCCD. Shammy Puri underlined opportunities for collaboration with work being done in other GEF FAs, eg International Waters. Youba Sokona observed the need to take existing indicator initiatives currently being implemented in affected countries into account, in addition to those initiatives proposed for review during the workshop. Sam Wedderburn advised the group of the potential for strong linkages with the work on indicators being undertaken by Terr Africa and the Strategic Investment Program (SIP), especially as the respective working groups were comprised of similar organizations.

Review of Conceptual Studies on the LD FA Commissioned by STAP

The Chair of the Workshop, Andrea Kutter (GEFSEC) observed that a clear definition of the intended impacts of the LD FA is the first requirement for the development of suitable indicators to measure these impacts. When the LD FA was created, various cases were argued for the existence of GEB from interventions addressing land degradation. However, no single, consistent definition of these was formally adopted. In 2004, a paper on '*Scope and Coherence of the Land Degradation Activities in the GEF*'² characterized ongoing discussions in the LD FA and the GEF Council. In 2006, a series of three studies was commissioned by the STAP to address conceptual issues in the definition of the LD FA and its intended impacts. These studies were presented for discussion during the workshop.

1) Global Impacts of Land Degradation

In this study, Michael Stocking (UEA), argued that practically all processes, including land degradation, can be considered to have indirect global impacts. The achievement of consensus on the anticipation of such impacts is primarily a political issue. For the immediate purposes of the GEF Council, it is necessary

¹ Details of the CEO approved MSP are available through the GEF project database at: <http://www.gefonline.org/projectDetails.cfm?projID=2863>

² This paper is available at: http://www.gefweb.org/Documents/Council_Documents/GEF_C24/gef_c24.html

to define some direct forms of global impacts to be anticipated from SLM interventions, and to measure them systematically. The study therefore presented a series of possible typologies of global impacts, accompanied by a discussion of their scientific merits and possible application in the GEF context. For example:

- Impact on recognisably global systems - climate, biodiversity, human development
- Impact on global ecosystem service types - Cf. Millennium Ecosystem Assessment (MA) goods/services
- By land-related processes occurring globally -E.g. deforestation
- By production systems occurring globally -Rainfed, irrigated, rangeland, forest
- By type of management system causing LD globally - E.g. over-grazing, vegetation clearance

The paper presented a matrix of impacts, and also considered the available scientific basis for the verification of impacts of LD/SLM interventions, including current knowledge gaps. The presentation and discussion concluded that the identification of impacts on global processes, including interlinkages with other GEF FAs, could offer a compelling approach to the discussion of ecosystem integrity at a global scale. These impacts are global in terms of their global systemic nature, rather than simply attaining global dimensions through cumulative occurrence, as is the case for other typologies presented. However, the likely effect of such a justification could be to diminish future allocations of funds to the LD FA if impacts were defined entirely through processes that are already addressed by other FAs. Although the LD FA has set out to systematically address and account for Interlinkages in the orientation of its new Strategic Objectives, this should be an interactive process undertaken with other FA's. In the meantime, the LD FA must justify its independent contribution to the achievement of GEB.

2) Quantifying Tradeoffs between Sustainable Land Management and other environmental concerns

The study on tradeoffs, presented by Bob Scholes (CSIR) addressed the issue of interlinkages in relation to climate change, biodiversity, water and livelihoods, presenting an intentionally simple six-step process for the analysis of tradeoffs, beginning with a rapid 'triage' appraisal of potential tradeoffs. Overall, this study anticipated net positive benefits from SLM actions for other environmental concerns. Nevertheless, it was argued that since, in a minority of cases, negative feedback loops might be identified, due diligence should be done to evaluate them.

A range of examples of indicators of relevance to these tradeoff areas were presented and discussed. In some cases, tradeoffs could be evaluated in net present value in dollars per hectare. In other cases, alternative units could be used, such as Disability Adjusted Life Years (DALYs). Where no common metric can be identified, tradeoff curves could be drawn on a shared activity basis, identifying a zone of optimal performance. The need to choose a manageable number of tradeoffs that really matter to be targeted by such an analysis was emphasized. This selection should be done in an appropriately participatory manner. The calculations should then be conducted in a way that is transparent, rather than through opaque softwares. The resulting calculations might not necessarily be linear, but they should be universally justifiable and accepted, as was the case for the IPCC. Tradeoffs between global and local, and between present and future benefits were also highlighted in the presentation and discussion.

3) Determining Global Environmental Benefits of Land Degradation Interventions Using the MA Framework

In the study by David Niemeijer and Dominic Moran the MAs ecosystem services concept was considered as a means through which a systematic analysis could be made of the global environmental benefits to be achieved through SLM projects supported by the GEF. This approach was found to hold potential to provide answers to the question as to what benefits can be identified at the level of the global environment, as a result of locally implemented projects. In an analysis of existing GEF project

documents conducted for this study, it was observed that, currently, projects highlight their impacts in terms of the global issues, but are unable to draw a well-argued quantitative or even qualitative link between local actions and global environmental benefits.

The articulation of a series of implicit assumptions generally made at the project level defining relationships between the following factors would enable an assessment of interventions' effects on ecosystem services:

1. Direct actions in application of SLM techniques (eg composting) resulting from indirect actions undertaken within GEF projects (eg capacity building)
2. Anticipated effect of altered SLM techniques on LD processes
3. Anticipated effect on ecosystem services of change in LD processes

Discussion

During the discussion, workshop participants considered the studies' aim to translate science into language to be understood by a wide range of politicians and decision-makers at different levels. This was found to be necessary in order to generate support for SLM and its intended benefits. Participants observed that there is not currently a well-defined universal set of principles encapsulating SLM, as exists for sustainable forest management. Peter Frost outlined the framework of sustainable forest management principles, for which CIFOR had developed a global set of criteria and indicators. Participants agreed that the definition and adoption of such principles, criteria and indicators for SLM could be a useful way of thinking about SLM and its anticipated impacts.

Participants considered the question as to what makes SLM distinctive, focusing in particular on definition in terms of sustainability. A series of general points about SLM and its definition were raised by participants during the discussion:

- Seen through the conceptual lens of the MA, SLM could be defined as land management leading to the sustained provision of ecosystem services, including supporting, regulating and provisioning services to support human wellbeing
- Changes in land management affect biodiversity, climate, natural hazards (mudslides, dustclouds, disease, fires and flooding) and downstream water resources. SLM is therefore necessarily linked to understanding of effects on a range of global processes.
- Land management techniques to be implemented under SLM are context dependent, and vary from one location to another; e.g., what works in drylands can fail in more humid environments
- SLM techniques are identified through a consultation process, involving farmers and other stakeholders, as well as expert scientific opinion
- Experience has demonstrated that for SLM to succeed, initiatives have to address local livelihoods
- SLM projects in the GEF focus on indirect facilitation of SLM, e.g. removing bottlenecks, building capacity, demonstration projects

Michael Stocking, Vice Chair of the STAP, observed that although the three studies have been presented to the GEF Council³, discussion of the issues that they raise is continuing, and no consensus on the anticipated Global Environmental Benefits from SLM has yet been reached at the political level. In order to be meaningful, any such consensus must refer to a basis of existing scientific evidence. Scientific peer reviews of the papers presented during the workshop would therefore be welcomed by the STAP. Workshop participants were invited to circulate written comments on the three studies for discussion by email following the workshop discussions.

³ The synthesis of three studies commissioned by the STAP is currently available at <http://stapgef.unep.org/>

Creation of a Global Indicator System

Relevance of STAP Studies

David Niemeijer addressed the need to track the impact of GEF interventions in SLM, reflecting on the contribution of the three STAP studies to this endeavor. The elucidation of a definition of GEB is clearly a necessary first step towards their measurement. Dr. Niemeijer identified a series of possible definitions of GEB that were considered in the STAP studies:

1. Reduction of global/regional environmental problems (global/regional scale of problems)
2. Reduction of worldwide environmental problems (global scope)
3. Reduction of environmental problems of common concern of human kind (Cross-generational timeframe)

Dr. Niemeijer then proceeded to discuss the ways in which these definitions could be operationalized, through indicator development, to track the impact of the GEF projects and portfolio, introducing issues to be addressed in subsequent discussions on indicator development.

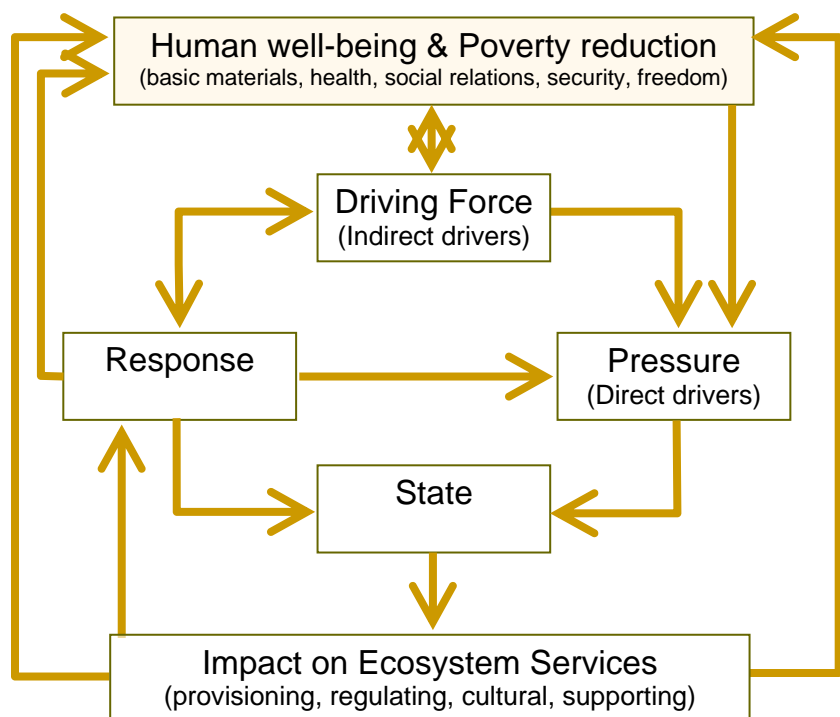
Participants reflected on the range of proposed definitions for GEB. Regarding the global nature of the LD issue, Bob Scholes raised the point both the causes and the consequences of LD include some global dimensions. Although this point has not so far resonated with the GEF Council, political awareness of its importance may be increasing. Participants generally observed that the identification of global environmental benefits in terms of global scope and pervasiveness would be the most simple, scientifically defensible, and politically acceptable definition. However, where such impacts were systemic, rather than simply cumulative, a stronger argument for GEF involvement could be made. In response to this point, it was observed that ecosystem services, including supporting and regulating as well as provisioning functions, reflect the state of the system in all three of the aspects listed in the definition. In relation to the third proposed definition however, challenges persist concerning available baselines and the time-bound observation of changes in relation to some of the relevant ecosystem services. These gaps should be addressed through pragmatic use of proxies where necessary in the short-term, and progressive filling of strategic data gaps over the longer term.

Development of an SLM Framework

Zafar Adeel considered the need for an agreed SLM framework in order to enable the selection of indicators for SLM interventions. Such a framework would enable the incorporation and streamlining of relevant knowledge, synchronizing of information, and identification of information gaps. This would contribute to the overall knowledge management needs of the LD FA to reduce uncertainty in evaluating global environmental benefits of SLM, and would support the integrated selection of indicators across a varying range of scales.

Dr. Adeel presented the findings of a recent initiative with the LD TF to develop a framework for SLM that could be used for the selection of indicators. This framework was developed for use within the upcoming GEF initiative on knowledge management and to form the basis of indicator selection for evaluation of global environmental benefits in the forthcoming GEF project on 'Ensuring impacts from SLM - Development of a Global Indicator System'. The proposed framework merges two well-established frameworks: the DPSIR framework, including identification of Drivers, Pressures, Impacts, State and Responses; and the Millennium Ecosystem Assessment framework for assessment of the contributions of Ecosystem Service to Human Well-being⁴.

⁴ A detailed discussion of the rationale for the development of this framework is included in the MSP project document at <http://www.gefonline.org/projectDetails.cfm?projID=2863>



Participants discussed the merits of the two frameworks, concluding that each had a contribution to make to the characterization of SLM. The DPSIR has achieved widespread scientific acceptance, through the process of its evolution from the PSR model. This is useful in ensuring universal application. But the DPSIR framework is reductionist – breaking things down for scientific scrutiny, while the MA model is integrative, pulling elements together towards simplicity. This enables conclusions to be drawn in a form that is more communicative for non-specialist audiences, focusing on the significance of impacts for human well-being. This perspective is designed to be more appealing to decision-makers. The combined framework, as presented, harnesses the benefits of both models. It will enable the LD TF to work with 10 different agencies, accommodating their own varying frameworks and priorities. In addition, the proposed framework is not specific to the GEF, but will have a wider relevance to the international scientific community. In light of these observations, the workshop participants reinforced the decision of the LD TF to adopt the SLM framework for use in ongoing work on knowledge management and the development of indicators for SLM impacts.

Selection of Core Sets of Indicators for Aggregation at the Portfolio Level

Following the presentation of SLM framework, Dr. Adeel reflected on the challenges ahead for the selection of indicators during the forthcoming MSP. These will include the identification of a few core indicators that can help to determine and communicate global benefits. Participants agreed that core sets of indicators should be selected for application in all projects in order to enable aggregation from the project level to the portfolio level. Individual projects or agencies might wish to measure other additional indicators in some cases, to supplement the core set according to their own needs and priorities.

Participants observed that the selection of core sets of indicators would require the proposed MSP to take a strategic lead on singling out the few most essential indicators of SLM, rather than producing shopping lists of information, as has been the case in some previous initiatives for land-degradation related initiatives.

Rather than reinventing the wheel, relevant indicators currently available through existing initiatives such as LADA and other initiatives discussed during the current workshop would be considered through a process of expert consultation, in order to identify their relationships to the SLM framework and potential for inclusion within the core indicator sets to be selected. Sam Wedderburn suggested the Composite Index of SLM Enabling Environment Index being developed by the SIP, as an example of the type of core programme level indicator that would be relevant. It would measure the strength of governance and policy dimensions conducive to SLM mainstreaming.

Two key tools for use during the MSP for the evaluation of potential indicators were presented by David Niemeijer for discussion by the workshop participants:

- Criteria for Indicator Selection
- Network Analysis Approach to Indicator Selection

Criteria for Indicator Selection

David Niemeijer described the proposal included in the MSP that indicator selection should be underpinned by a series of universally acceptable indicator selection criteria, both for individual indicators, and also for indicator sets. Proposed set level criteria presented were:

- Internal correlation
- Conceptual coverage (relevant components of framework)
- Contents coverage (relevant issues/problems)
- Usability as proxy
- Cross-cutting potential (links to key indicators outside set)
- Compositing potential
- Suitability for computing relative indicators (e.g. ha, capita)

Proposed individual criteria:

<i>Criterion</i>	<i>Description/Explanation</i>
Credible	Scientifically credible
Robustness	Be relatively insensitive to expected source of interference
Space-bound	Sensitive to changes in space
Time-bound	Sensitive to changes within policy time frames
Measurable	Measurable in qualitative or quantitative terms
Portable and Universal	Be repeatable and reproducible in different contexts
Cost-effective	Benefits should outweigh the costs of usage, resource allocation
Data requirements	Manageable data requirements
Compatible	Compatible with indicators developed and used elsewhere
Linked with management	Linked with specific management practice or interventions
Scale of applicability	Provide information at the right spatial and temporal scales

A discussion of these criteria would be conducted at the outset of the MSP, in order to arrive at the adoption of criteria that would be acceptable to all members of the project working group. During the current workshop, participants did not discuss the adoption of specific criteria, but focused on the indicator selection as a whole. Nevertheless, comments focused on the necessity that the indicators should be communicative at the level of the GEF Council and other policy-makers. It was further suggested that

the indicators might be rendered particularly communicative if they could lend themselves to visual presentation, eg through maps or figures. Participants further underlined the need for indicators to be in line with those accepted by stakeholders and parallel processes, such as IPCC.

Network Analysis Approach for Indicator Selection

David Niemeijer presented a network analysis approach to indicator selection to be undertaken, based on the SLM framework. Dr. Niemeijer explained that this approach was needed because although there is no lack of indicators available, the issue is to choose the right ones. To ensure scientific validity of the indicators, the process should include the identification of all existing indicators of relevance to SLM, followed by construction of a dynamic map based on the causal relationships between processes, effects, and other external factors. This map would include the relationships between tradeoffs to be measured. Nodes that serve as key focal points should be identified within the network, and corresponding indicators selected. Where the desired indicators would be hard to measure, the map would identify related proxies that could be used.

Critical comments were invited from the workshop participants in order to ascertain whether or not the proposed network analysis was considered an effective approach to the selection of indicators. Participants commented on the subjectivity of the exercise in tracing causal networks, concluding that different people might come up with completely different causal maps. However, in light of the fact that all selection processes are necessarily subjective, participants appreciated the transparency of the causal network approach, and found that it would enable objective discussion of the choices in the selection of indicators, proxies and tradeoff analyses, particularly at the project level. John Pender suggested that it could be useful to think through different types of causal chains for different ecosystems, and then to look for commonalities between them in order to come to a final selection. Various participants expressed interest in the nature and degree of participation that might be incorporated into the indicator selection activities, including the causal chain analysis.

Challenges for Knowledge Management at the Project Level

David Niemeijer presented a number of further challenges for indicator development that are currently encountered at the project level. These include the complexity of land degradation processes, the lack of baseline data, the short duration of interventions and their associated monitoring programmes, limited funds available for monitoring, and finally, the indirect nature of interventions favored by the GEF which make it more difficult to attribute changes in land degradation to project activities. In light of problems concerning the attribution of impacts, Dr. Niemeijer argued that it is advisable to determine the anticipated impacts of a project from the outset, rather than to measure changes in land degradation after the project, and then to try to connect attribution of these changes to project activities. An approach was proposed for the estimation of impacts on ecosystem services at the project level from inception that could provide the basis for meaningful aggregation of impacts on ecosystem services at the portfolio level. This approach provided for iterative adaptive management throughout the project in order to review achieved and expected results, conduct tradeoff analyses, adjust implementation and compare estimated impacts versus measured impacts.

Naoufel Telahigue voiced concern from the project management perspective that core indicator sets to be measured at the project level should not overburden project managers or divert project design from the achievement of SLM objectives. John Pender reflected on the pitfalls of over-emphasizing quantitative targets and specificity in project definition. These issues should be tackled through the indicator selection criteria and reflected in the design of the core sets of indicators and their application. Participants compared the approach proposed by Dr. Niemeijer to the current practice of project-by-project indicator

development, based on the project logframe. Dr. Niemeijer proposed a schematic decision-tree that would articulate inherent assumptions made currently by project managers regarding the likely effects of their projects; and connecting them to impacts on ecosystem services. Participants agreed that it would be useful to document and critique these inherent assumptions, concluding that the proposal was simply a systematization of work already done by project managers.

Participants welcomed the prospect of increased opportunities for critical discussion and learning of lessons from project implementation experiences, including the critical selection of baselines and counterfactuals. Bob Scholes observed that adaptive management isn't simply learning by doing. It requires an observation and knowledge management system. It also requires an explicit hypothesis that can be tested in a transparent manner, and subsequently modified as necessary. Roy Behnke observed that issues of attribution and variability could be analyzed meaningfully within such an adaptive management system. Barry Shapiro highlighted the potential opportunities afforded by such a learning process to draw on theories of social welfare and decision theory, and to incorporate analysis of tradeoffs. John Pender suggested that a knowledge management system could incorporate a typology of situations, in order to develop conclusions about what works where in SLM. This information could be fed back into the development of new projects.

Presentation of Current Indicator Development Initiatives and Synergies

A series of presentations were made during the workshop focusing on existing indicator development initiatives and synergies. These presentations were intended to inform the indicator selection process of relevant available indicators that should be taken into consideration during the GEF indicator selection process. Once launched, the forthcoming MSP should be well-positioned to learn from the experiences of previous initiatives in order to avoid redundant duplication of efforts and processes wherever possible. Synergies between the GEF indicator selection activities and other ongoing initiatives should be maximized in order to enhance the global knowledge base on land degradation and SLM.

Presenters gave overviews of the various indicator initiatives. A brief comparative summary of these overviews is presented in Table 1, below. In addition to providing information about existing initiatives, presenters also selected key recommendations from their experience to contribute to the present discussions of indicator selection in the context of the forthcoming MSP.

Reflections on Experience in Indicator Selection

1) Ulf Hellden, University of Lund: DeSurvey

This initiative was developed by academics with an interest in learning more about the processes leading to desertification. However, the analysis of hotspots and brightspots of vulnerability that it produces can be useful to decision-makers and the GEF.

2) Fernando Santibañez, University of Chile: UNCCD/CST Benchmarks and Indicators and Monitor project

The UNCCD/CST is currently engaged in work to define indicators and benchmarks of desertification (B&I) in order to propose effective methodologies at different levels. The current initiative on the development of a global indicator system by the GEF is complementary to this work. Both can draw on the achievement of previous LD indicator initiatives at the international level, such as the Monitor project.

TABLE 1: Overview of Indicator Initiatives Presented

Indicator Initiative	Institution	Scope	Focus of Indicators	Process for Selection	Data Collection Methods	Outputs	Stage of Development
Ground-water Indicators	UNESCO-IHP	Global	Groundwater: -Dependence and Exploitation -Quality and vulnerability -Relation to Land-use	Case studies at different spatial scales			Indicators developed and tested in case studies
Sustainable Forestry Indicators	CIFOR	Global	-Policy -Ecology -Social -Goods and Services	-Field evaluation -Consolidation from previous range of disjointed initiatives - Based on principles from Rio 1992	Field testing – see toolbox	Criteria & Indicators Toolbox Published in 9 volumes	Complete
2010 BIP Biodiversity Indicator Partnership	UNEP/GEF (presented by FAO)	Global	By ecosystem: -State of biodiversity -Sustainable use -Connectivity - Food and nutrition				Under development
GLCF Global Land Cover Facility	University of Maryland	Global (mostly humid areas)	Land cover: forest, herbaceous, grassland		Remote sensing	ESDI Earth Science Data Interface	Data available for analysis
LADA	FAO	Global	Global: NDVI: NPP & RUE National: Land cover change Local: socioeconomic			Toolbox of indicators	Ongoing
DeSurvey	University consortium (EU-funded)	Global: Europe, N Africa, Senegal, China + Chile	Land cover: biomass & vegetation fractional cover	Survey of partners: 70% in favor	Remote sensing	Modeling land use systems' vulnerability to socioeconomic and climate forcing	Prototype system available 2008
TerrAfrica SIP	TerrAfrica: Partnership of devt institutions	Regional (Africa)	Programme targets and objectives -social and economic indicators -soil carbon content -FAO land cover classification type - SLM enabling environment indicator	Working groups of African experts Workshop, email survey	(Soil carbon content assessed by ICRAF through infrared spectroscopy)	Indices: -Core Welfare Indicators -SLM Enabling Envnt -SLM advocacy -Sustainability index -Infrared spectroscopy	Indices ready end 2007
Monitor	University consortium	Regional (Latin America)	Diagnosis of LD -by production units	Local participatory processes	Remote sensing/ field observation	Map coefficients of impact severity	Series of completed data collection projects
WOCAT / LADA	CDE/FAO / ISRIC	Global	Assessment of LD & conservation (SWC): vegetation, cover, top soil crusting, sealing, compaction, erosion, biodiversity, environmental services	Local /national participatory processes	Expert and Land user assessment, field observation	Standardized maps, case studies on bright spots, SWC technologies and approaches with a series of defined indicators at local level	Ongoing, revision to incl. environmental services, biodiversity and adding to soil degradation, water & vegetation degradation

3) *Ben White: University of Maryland: Global Land Cover Facility (GLCF)*

Management of land cover fundamental to SLM. Recent developments in remote sensing can be used in combination with field data to identify changes in land cover, including soil characteristics. Although more work has been done on this topic in tropical regions, these techniques can also be applied effectively in dryland areas.

4) *Veronica Muthui, UNDP: TerrAfrica and Strategic Investment Program (SIP)*

Indicator development initiatives are underway within the TerrAfrica Programme and SIP to develop indicators that respond to the strategic needs of the GEF LD programme. Although these initiatives are specific to Africa, the indicators to be produced will include some of broader relevance for the Focal Area. The initiative for development of a global indicator system and the creation of a Learning Network within the GEF LD portfolio should build on these experiences and form close linkages in order to avoid duplication.

5) *Shammy Puri, Jaroslav Vrbe and Alice Aurelie, IHP: Groundwater Indicators of UNESCO-IHP*

Indicator development challenges faced in the International Waters (IW) FA of the GEF are similar to those faced in the LD FA. There is scope for exchange and complementarities between these two initiatives, particularly due to the interactions at the land-water interface: land-use decisions affect the quality and quantity of available water resources and determine vulnerability to climate change.

6) *Hanspeter Liniger, WOCAT*

For the documentation, monitoring, evaluation and dissemination of SLM /SWC practices (bright spots) a standardized method and tools had to be developed using a set of indicators to assess impacts of different land management. This was developed at two levels: at the local/field level for the documentation and evaluation of case studies and at the national/regional level for the mapping and assessment of degradation and SLM/SWC and its impact (together with LADA).

Expert Presentations on Issues in Indicator Selection and Knowledge Management

Expert presentations on issues in indicator selection and knowledge management processes were contributed by a range of workshop participants. In addition to highlighting further experiences in the use of indicators, these presentations also contributed generic comments on the use of indicators at a series of levels, from the global level to national and project levels.

6) *Parvis Koohafkan (FAO): Various FAO work on Indicators*

FAO has been engaged in a range of indicator initiatives of relevance to SLM at policy and technical levels. The current GEF process should enhance synergies between the many ongoing initiatives, establishing links between GEF projects and national and regional programmes /processes (NAP-SAP; NBSAP, etc.) including cross-cutting areas (PRSP, food security, livelihoods). It should draw on indicators and assessment methods developed and tested within initiatives such as LADA and TerrAfrica and promote their effective use across the global LD portfolio.

7) *HansPeter Liniger (WOCAT): GEF Focal Area Indications.....and Conservation?*

The presentation addressed the possible relevance to users of a database of indicators, drawing on experience and examples from the WOCAT Global Knowledge system. It addressed issues in the sharing of knowledge at the national level and across countries and regions through questionnaires and other processes involving stakeholders. It stressed the importance of developing with all the stakeholders a standardized approach such that knowledge could be shared. This presentation raised considerable interest in knowledge management issues and reflections on efforts to draw generic conclusions at the global level from locally specific interventions. It also illustrated the development of a mapping tool to address the

extent and severity of degradation (in collaboration with LADA) as well as the extent and effectiveness of SLM practices (SWC technologies).

8) John Pender (IFPRI): Indicators for Assessing SLM projects- IFPRI Experience and Suggestions

This presentation highlighted the importance of critical discussion addressing the techniques and assumptions used in the assessment of impacts. Pender argued that indicators are not sufficient to attribute impacts to an intervention. Evaluation of the counterfactual situation (i.e., what would have happened in the absence of the programs being evaluated) is necessary to assess impacts, and simple before-after comparisons rarely suffice for this. A range of established qualitative and quantitative methods are available to address this concern and should be used and further developed through the incorporation of learning processes within a knowledge management system to support the GEF initiative on global indicators. The causality pathway approach is a useful starting point for these discussions. To date, assessments of SLM projects have not achieved the same level of rigor in addressing the attribution issue as projects eg in poverty reduction. There is an opportunity for the initiative on knowledge management to contribute.

9) Frederick Muchena (ETC): Indicators for Sustainable Land Management in Kenya's Context

This presentation considered the need for the proposed work on a global system for indicators to be linked to national-level information systems. Dr. Muchena reflected on the multiple issues underpinning trends in land degradation affecting Kenya, and the range of different relevant indicators used to address them. Dr. Muchena observed that there is a need for cascades of indicator systems going beyond the proposed core sets of GEF indicators for use on the ground in affected countries; and that coordination and integration between systems should be maximized wherever possible.

9) Douglas White (CIAT): Indicators and Overcoming Land Degradation: To mitigate deforestation in the humid tropics

Dr. White observed that indicators should have an agreed meaning and anticipated relationships to land degradation processes and successful SLM application. They should be connected to other information and processes beyond the indicator system at national, regional and local levels. Dr. White also expressed interest in the potential links to a related digital information system linking poverty reduction, climate change and carbon issues, water use, and biodiversity, including the Earth Institute at Columbia University, ISRIC, CIAT and other regional centers.

10) Peter Frost (CIFOR): Development and Application of Criteria and Indicators Framework

Peter Frost described CIFOR's experience in developing a set of criteria and indicators for sustainable forest management. The framework has been widely used and adapted in many forest management programmes around the world, and influenced the development of criteria used by the Forestry Stewardship Council to certify forest management systems and their products (see table above). This experience has been critically evaluated by Sheil et al, (2004) in *Ecology and Society*⁵. The current initiative could learn from the process of developing indicators through the identification of principles, as well as from the ethical challenges faced.

11) Andres Arnalds (Soil Conservation Service, Iceland): Reflections from a Century of Soil Conservation in Iceland

This presentation reflected on national-level needs for indicators to evaluate policies, programmes and projects. Dr. Arnalds observed that needs for indicators at the national level are distinct from the needs at the global level, although there can be connections made between elements of the two. From the national level perspective, 'soft' indicators of capacity and awareness amongst land managers and users are particularly important because these factors determine the success of efforts to combat land degradation.

⁵ This paper was circulated by email to all workshop participants following the meeting.

Summary of Workshop Recommendations and Follow-up

Zafar Adeel gave a brief presentation, recapping the main findings of the workshop discussions. These recommendations were discussed by the workshop participants. A final set of recommendations and items for follow-up after the workshop is listed below:

Recommendations to the GEF Secretariat:

- There is a need for development of definitions of global environmental benefits from SLM. This should be linked to development of an overall set of principles for SLM;
- The GEF Secretariat and STAP should conduct a peer review of the completed STAP studies; the review comments should be provided to STAP for further action; and
- The GEF Secretariat should consider:
 - Elements other than indicators in determining the global environmental benefits; these may include lessons learned and other element of knowledge management
 - Creation of opportune links between indicator development and broader ongoing processes (examples include carbon trading initiatives; Payment for Environmental Services; and requests by the GEF Council)

Recommendations for Indicator Selection

- The SLM framework developed with the LD TF was considered valid and appropriate by the wider group of participating experts;
- The current need and opportunity for the creation of a global system of indicators to measure impact of SLM interventions was observed by all participants;
- A few core indicators should be selected to capture the respective impact on global environmental benefits;
- Causal network analysis is a useful tool for indicator selection; and
- The criteria for indicator selection should be further refined to ensure:
 - linkage to decision-making
 - inclusion of outcomes and impacts
 - relevance to other indicators (eg IPCC)
 - usage by GEFSec and other institutions and programs
 - sensitivity to timescales.

Recommendations for Process

- The need for collaboration and harmonization was emphasized, particularly the linkage of the forthcoming MSP to parallel initiatives like TerrAfrica, LADA, WOCAT, and others;
 - There is a need to ensure coherence with the GEF-4 LD strategic planning process; and
 - The forthcoming MSP should give due consideration to presentation formats, including maps and multimedia formats
- **Agreed next steps for indicator selection:**
- Launch of the MSP on 'Ensuring impacts from SLM - Development of a Global Indicator System';
 - Creation of a core advisory group of experts within the MSP;
 - Development of an informal network to support knowledge management and MSP implementation.

Immediate follow-up activities to take place after the workshop:

- Participants to send comments on STAP studies presented to authors with copy to workshop participants;
- Participants send comments and corrections on the workshop report **before February 2nd** to: cking@inweh.unu.edu

- Participants send recommendations for any additional groups or initiatives to be consulted once the MSP begins to cking@inweh.unu.edu including name of contact person.
 - Suggestions already received:
 - Technical Support Unit (TSU) for IPCC-NGGIP⁶: proposed by Youba Sokona
 - 2010 Indicators for Biodiversity: proposed by Anna Tengberg

Concluding Remarks

Andrea Kutter thanked all participants for their candid and productive contributions to the workshop discussions, and welcomed all participants to the informal network to be initiated following the workshop.

⁶ Provides methods and good practice guidance for estimating, measuring, monitoring and reporting on carbon stock changes and greenhouse gas emissions <http://www.ipcc-nggip.iges.or.jp/>

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Workshop Programme

Monday - 8 January 2007

- 09:30 Welcome Remarks (FAO, GEF Sec) and Introduction of Participants
- 09:45 Overview of the Workshop Objectives and Modus Operandi (Adeel)
- 10:15 *Coffee Break*
- 10:45 Analysis of STAP Studies on Global Impacts of Land Degradation, Global Environmental Benefits from SLM and Trade-offs
- Michael Stocking
 - Bob Scholes
 - David Niemeijer
- 12:00 Discussion on STAP studies
- 13:00 *Lunch*
- 14:30 Technical Paper on relevance of STAP studies for Global Indicator System (Niemeijer)
- 15:00 Concepts for SLM Indicator Framework (Niemeijer/Adeel)
- 15:30 *Coffee Break*
- 16:00 Discussion on SLM Indicator Framework
- 16:30 Approaches for Indicator Selection for the SLM Indicator Framework (Niemeijer)
- 17:00 Discussion
- 17:30 Meeting adjourned
- 18:00 Cocktail (Indonesia Room, FAO)

Tuesday - 9 January 2007

- 09:00 Presentation of Key Indicator Development Initiatives and Synergies
- DeSurvey (Hellden)
 - UNCCD/CST Benchmarks and Indicators (Santibañez)
 - Global Land Cover Facility/University of Maryland, USA (B. White)
- 10:30 *Coffee Break*
- 11:00 Presentation of Key Indicator Development Initiatives and Synergies (contd.)
- TerrAfrica (Muthui)
 - Groundwater Indicators of UNESCO-IHP (Puri, Vrbe, Aureli)
- 12:15 *Lunch*
- 13:45 Expert Presentations
- FAO Work on Indicators (Koohafkan)
 - WOCAT (Liniger)
 - IFPRI (Pender)
- 15:30 *Coffee Break*
- 16:00 Expert Presentations (contd.)
- ETC (Muchena)
 - CIAT (D. White)
 - CIFOR (Frost)
 - Iceland (Arnalds)
- 17:30 Formulation of Recommendations
- 17:50 Concluding Remarks
- 18:00 Meeting Adjourned

List of Abbreviations and Acronyms

BIP	Biodiversity Indicator Partnership
B&I	Benchmarks and Indicators (UNCCD/CST)
CIAT	International Center for Tropical Agriculture
CIFOR	Center for International Forestry Research
CSIR	Council for Scientific and Industrial Research
CST	Committee on Science and Technology (UNCCD)
DALY	Disability Adjusted Life Year
DPSIR	Indicator framework comprising Drivers, Pressures, State, Impact and Response
ETC	
EU	European Union
FA	Focal Area (GEF)
FAO	Food and Agriculture Organization (UN)
GEB	Global Environmental Benefits (GEF)
GEF	Global Environment Facility
GEFSEC	GEF Secretariat
GLCF	Global Land Cover Facility (Univ. Maryland)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IPCC	Intergovernmental Panel on Climate Change
ISRIC	International Soil Reference and Information Centre
IW	International Waters (GEF)
LADA	Land Degradation Assessment in Drylands Project (FAO)
LD	Land Degradation (GEF)
MA	Millennium Ecosystem Assessment
MSP	Medium Sized Project (GEF)
NAP	National Action Program (UNCCD)
NBSAP	National Biodiversity Strategy and Action Plan
NDVI	Normalized Difference Vegetation Index
NPP	Net Primary Production
OSS	Observatoire du Sahara et du Sahel
PDF (A/B)	Project Development Facility (GEF)
PRSP	Poverty Reduction Strategy Plan
RUE	Rainfall Use Efficiency
SAP	Strategic Action Program (GEF IW)
SIP	Strategic Investment Program (TerraAfrica/GEF)
SLM	Sustainable Land Management
STAP	Scientific Technical Advisory Committee (GEF)
SWC	Soil and Water Conservation
UEA	University of East Anglia, UK
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNEP	United Nations Environment Programme
UNESCO-IHP	United Nations Educational, Scientific and Cultural Organization, International Hydrological Programme
UNU-INWEH	United Nations University International Network on Water Environment and Health

WOCAT

World Overview of Conservation Approaches and Technologies