

PREFACE

These *Guidelines* are designed to provide assistance to those interested in collecting measurements and assessments of land degradation rapidly in the field. They have a particular emphasis on the effects important to land users and a special focus on dialogue with farmers who can not only advise on what is important to them but also give the field assessor a continuous monitoring capability which would otherwise be missed in occasional field visits. Primary consideration is given to small-scale rainfed agriculture in the tropics because this covers the majority of situations and the largest numbers of rural people. While large-scale commercial agriculture is not specifically mentioned and rangeland and wetlands only briefly so, the principles that apply throughout these *Guidelines* will be of assistance.

These *Guidelines* arise from the need, expressed to us many times by field workers, for a readily-accessible and practical guide to field measurement of land degradation. Traditional techniques have usually involved bounded field plots and measurements of soil loss and runoff into collecting tanks. But these are cumbersome methods, yielding only limited information even after several years of monitoring. The artificiality of the experimental devices also renders many of the results difficult to interpret in a way meaningful to real field conditions. So, when we have been undertaking fieldwork with our collaborators, most of whom are from (and work in) developing countries, we have been on the alert for simple, direct and useful measures of the dynamics of the processes leading to land degradation. We have found that the more we have looked, the more is the evidence in the field that has been unseen in the past. The evidence may only amount to small accumulations of soil, or thin layers of residual stones on the surface – both easily overlooked. However, these are 'real' pieces of evidence occurring in actual fields being used by farmers; they represent the outcomes of processes usually instigated by land use practices. So, we feel, they have enormous value – a value that is enhanced by the fact that many measurements can be accomplished much more rapidly than by traditional techniques. Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) have tended to be dominated by social or economic enquiry. We believe that change in natural resource quality is also amenable to the benefits of RRA and PRA approaches.

Land degradation is a topic that is regaining prominence. Because of its potential threat to land resources and to the viability of human societies, land degradation has been the subject of alarming statistics. For example, the *Global Assessment of Land Degradation (GLASOD)* project calculates that 22.5 per cent of all productive land has been degraded since 1945, and that the situation is becoming rapidly worse. Yet, at the same time, few people have a clear idea of what land degradation is and even fewer could suggest ways in which it can be practically assessed in the field.

The confusion is unsurprising. Land degradation has tended to become caught up with other debates on environmental change. Degradation is, however, a biophysical process well known to farmers and other land users. Routinely, they describe how soils are getting thinner and 'worn out' and how yields are declining. As degradation progresses, farmers' efforts to secure a living become increasingly precarious and uneconomic. This publication will focus exclusively at this level, on assessing degradation as a process affecting activities of the farm household, rather than attempting global, national, regional or provincial assessments. Efforts to extrapolate to larger areas of land than the field or farm are fraught with inaccuracies and dubious assumptions, which we shall leave to others. Our focus will be through the eyes of farmers (Chapter 1), addressing issues that concern land users as of primary importance (Chapter 3). In Chapter 2 we shall carefully distinguish between land degradation, aspects of it such as soil degradation, and some of the biophysical processes that lead to land degradation. Inevitably, indicators will have to be used, and many of these will be derived from degradation processes such as soil loss (Chapter 4) or degradation

outcomes such as the effects on production (Chapter 5). Assessments of land degradation are not, by themselves, very useful. Therefore, we show how the simultaneous collection of several indicators can lead to a much better realisation of the relevance to land users (Chapter 6), showing the consequences (Chapter 7) and giving leads into the design of appropriate techniques of conservation (Chapter 8). It is not, however, our objective to present conservation options – many technologies exist and handbooks on them abound.

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We are grateful to two projects that have given us the opportunity to bring our experiences together into this manual of field techniques. First, the *People, Land Management and Environmental Change (PLEC)* project, funded by the Global Environment Facility 1998-2002, implemented by the United Nations Environment Programme (UNEP) and executed by the United Nations University in Tokyo, has a global network of demonstration sites. These sites are where farmers demonstrate 'good practice' in managing and conserving biological diversity. Part of this management relates to maintaining soil quality, and preventing land degradation. Hence, *PLEC* collaborators (now over 200 in 12 developing countries) have been making field assessments of land degradation to support their monitoring of examples of good practice. One of us (Michael Stocking) is the Associate Scientific Co-ordinator of *PLEC* and our two advisers have also been consultants for the project with Geoff Humphreys having a particular role in undertaking land degradation assessment. UNEP and UNU have requested additional support and guidance for these field activities, and these *Guidelines* are intended to provide them. Secondly, the UK Department for International Development (DFID) funded a research project 1996 to 1999 in Sri Lanka under its Natural Resources Systems Programme, entitled *Economic and Biophysical Assessment of Soil Erosion and Conservation (R6525)*, which developed a number of the techniques described in these *Guidelines*. Michael Stocking was the Principal Investigator, and the project involved many Sri Lankan hill farmers showing how they perceived soil erosion, and how land degradation was perceived by them. Rebecca Clark was the ODG Research Associate for this project, and we are grateful to her for working with many of the techniques in these *Guidelines* in the field and helping to develop a solid farmer-perspective. DFID also commissioned the project to undertake a training course on soil erosion assessment in Bolivia in 1998, attended by some 30 local professionals, in which many of the techniques were tested. In Sri Lanka and Bolivia our local collaborators became excited in the field as they saw more and more evidence of degradation in field drains, boundary walls, under stones, and in the middle of fields. Even an experienced soil surveyor said that he was seeing things he had not noticed before in 30 years of fieldwork. We want to try to transmit that enthusiasm to others through this publication. We are extremely grateful to both UNU/UNEP and DFID and to our many collaborators. This publication is officially an output from both projects.

However, without funding support from UNEP through trust funds from the Government of Norway, we would have been unable to collate the many experiences, photographs and measurement techniques that form the basis of these *Guidelines*. Timo Maukonen at UNEP has been most supportive of this project, and we thank him sincerely. His enthusiastic comments on an early draft gave us great encouragement. In addition, we must mention our two advisers on the project: Anna Tengberg at UNEP has worked with us on land degradation issues for several years and has given us valuable advice; Geoff Humphreys of Macquarie University has provided training materials from his work for *PLEC* as well as additional material from his own work in Australia. We thank them both for their interest and dedication.

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