

RIU

# Teaching smallholders to combat soil erosion

## Validated RNRRS Output.

A systems framework forms the basis of a training tool for field professionals working with smallholder households on the impact of farming activities on soil erosion and conservation. Methods for the field assessment of both biophysical and economic aspects of erosion and conservation by developing country professionals and field staff are included. The methodology has been published and presented at meetings and training workshops. The publication was originally put on the Internet and is now available in print in English and Spanish, with an Arabic version in preparation. The technique has been widely adopted around the world. It is used in 26 countries with eight more about to take it up. This includes 12 countries of sub-Saharan Africa.

Project Ref: **NRSP06** :

Topic: **4. Better Water Harvesting, Catchment Management & Environments**

Lead Organisation: **Overseas Development Group, UK**

Source: **Natural Resources Systems Programme**

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## Document Contents:

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## Description

**NRSP06**

## Research into Use

NR International  
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ME20 6SN  
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## Geographical regions included:

[Algeria](#), [Argentina](#), [Bolivia](#),  
[China](#), [Cuba](#), [Senegal](#), [South  
Africa](#), [Sri Lanka](#), [Uganda](#),

## Target Audiences for this content:

[Crop farmers](#), [Livestock  
farmers](#), [Fishers](#), [Forest-  
dependent poor](#),

## **A. Description of the research output(s)**

### *1. Working title of output or cluster of outputs.*

#### **Field methods to assess the extent and impact of land degradation in the context of local livelihoods**

### *2. Name of relevant RNRRS Programme(s) commissioning supporting research and also indicate other funding sources, if applicable.*

Natural Resources Systems Programme (Hillsides Production Systems) & Socio-Economic Methodologies (jointly funded when both NRSP and SEM were managed within DFID)

Additional funding:

Government of Norway (Trust Funds through UNEP)

United Nations University

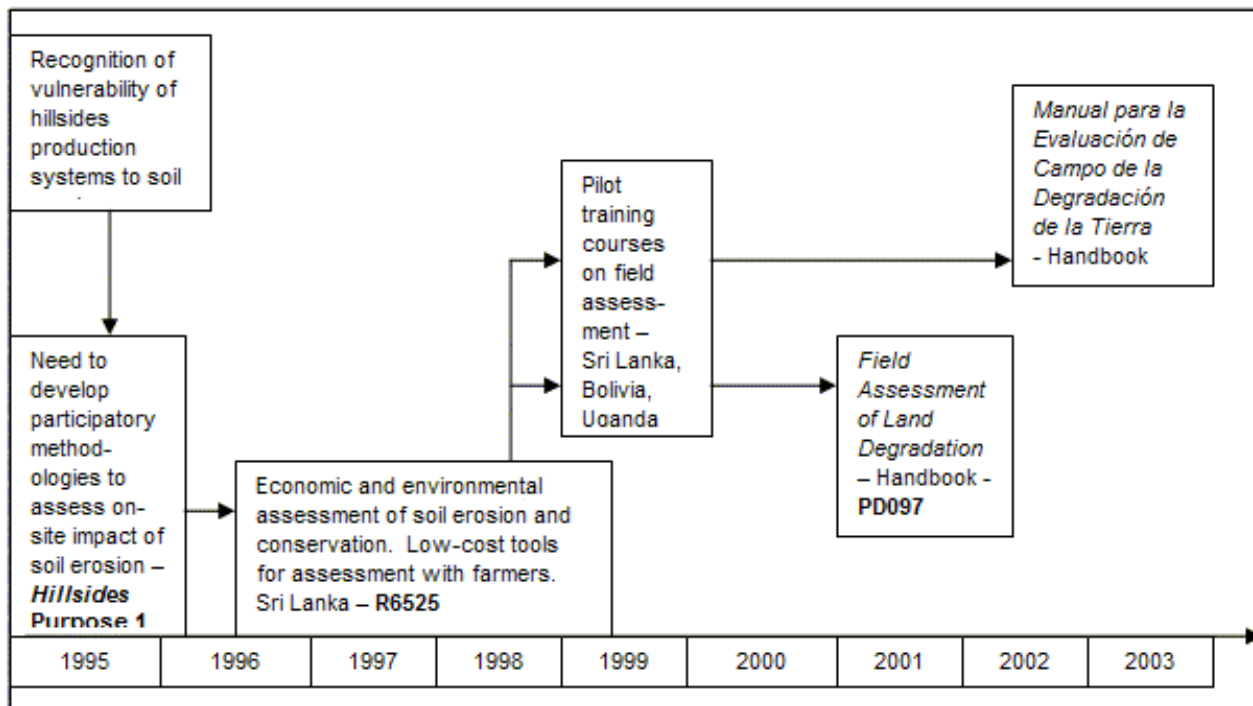
### *3. Provide relevant R numbers (and/or programme development/dissemination reference numbers covering supporting research) along with the institutional partners (with individual contact persons (if appropriate)) involved in the project activities. .*

R6525: Methods of economic and environmental assessment of the on-site impacts of soil erosion and conservation - a case study of smallholder agriculture in Sri Lanka (1996-1999)

PD097: Field assessment of land degradation from the perspective of the land user: validation and production of guidelines (2001)

PD118: *Manual para la Evaluación de Campo de la Degradación de la Tierra*

- Spanish translation of PD097 output (2003)



The above diagram shows the sequence and timing of project activities, indicating that outputs have already been widely used – see answer to Question 9 below. This diagram was prepared as part of the Node:Suite analysis of NRSP, by Michael Stocking.

Partners:

In UK: Overseas Development Group, University of East Anglia. Professor Michael Stocking ([m.stocking@uea.ac.uk](mailto:m.stocking@uea.ac.uk))

In Sri Lanka: The Environment and Forest Conservation Division of the Mahaweli Authority of Sri Lanka. Contact: Dr H. Mathratilake, Director EFCD (Tel: +94 8 34950) and, through staff involvement in evaluation and training workshops, other institutions in Sri Lanka including the Tea Research Institute (Talawakelle), Water Resources Secretariat (Colombo), Forest Department (Kandy), GoSL Department of Agriculture (Peradeniya) and University of Peradeniya.

In Bolivia: PROINPA (Promoción e Investigación de Productos Andinos) Toralapa Research Station, and 15 other institutions.

In Uganda: Department of Soil Science, Makerere University P.O. Box 7062, Kampala. Contact: Mrs J. Tumuhairwe, Senior Lecturer (Tel: +256 41 543 617 Fax: +256 41 543 382 E-mail: [plectumu@imul.com](mailto:plectumu@imul.com)); Faculty of Development Studies, Mbarara University of Science & Technology, P.O. Box 1410, Mbarara Contact: Contact: Mrs Pamela Mbabazi, Acting Dean (Tel: +256 485 21126 Fax: +256 485 20782 Mobile: +256 77

490676 E-mail [Highland@imul.com](mailto:Highland@imul.com))

4. Describe the RNRRS output or cluster of outputs being proposed and when was it produced?

Output (1): A **systems analysis framework** for examining soil erosion and conservation in the context of the household used for **training of field professionals**.

A preliminary systems analysis framework was developed in 1996 that examined interactions of soil erosion and conservation with smallholder farming households. In the form of cobweb diagrams, this provided visualisations of inter-linkages between different aspects of smallholder households. The preliminary framework was employed to investigate the possible impacts of erosion and conservation for smallholder households in the project's study area. The published framework (1998) was the first time that a clear distinction has been drawn between "resource-value" approaches (i.e. valuation of the depletion of nutrients and/or other measures of soil quality by erosion), "production-value" approaches (i.e. loss in yield with erosion, or gain through conservation), or "livelihoods-value" (i.e. contribution to household livelihoods). The Sustainable Rural Livelihoods framework was subsequently modified (2000) to accommodate these issues and remains as a key means of analysing the trade-offs of small farmers as they decide how to use their land in constructing livelihoods.

Output (2) **Guide to data sources** and **practical field handbook for land degradation assessment** from which information can be obtained rapidly on extent of degradation and impacts on livelihoods.

An emphasis was taken throughout the project to develop variables and indicators for both biophysical and economic assessments direct from the field and farmer. Biophysical techniques of erosion and conservation assessment for in-field use by developing country professionals and field staff were published (1996) and were presented at various meetings and at two residential training workshops (Sri Lanka, November 1997; Bolivia, November 1998). Output 2 was realised first when the 120 page draft *Guidelines on Field Assessment of Land Degradation* was posted on a web-site ([www.unu.edu/env/plec](http://www.unu.edu/env/plec)) in its revised version in late October 2000. It is now available as a book, in English and Spanish, with an Arabic version in translation:

Stocking, M.A. & Murnaghan, N. 2001. Handbook for the field assessment of land degradation. Earthscan Publications, London. xvi + 169 pp.

Stocking, M.A. & Murnaghan, N. 2003. Manual para la Evaluación de Campo de la Degradación de la Tierra. Mundi-Prensa Libros, Madrid, 173pp.

Training materials are now (2006) incorporated into documents of FAO and UNU for use in two major environment projects funded by the Global Environment facility – see below.

See diagrammatic representation of sequence of events for answer as to "when produced".

5. What is the type of output(s) being described here?

Please tick one or more of the following options.

<b>Product</b>	<b>Technology</b>	<b>Service</b>	<b>Process or Methodology</b>	<b>Policy</b>	<b>Other Please specify</b>
<b>x</b>		<b>x</b>	<b>x</b>		

6. What is the main commodity (ies) upon which the output(s) focussed? Could this output be applied to other commodities?

The project was not commodity-specific and could be applied to any hillside farming situation where soil erosion and other land degradation processes are common. However, the techniques and tools of analysis probably work best for upland, steep slope, arable cropping on drylands (i.e. without irrigation). They are also possible on rangeland, especially if rates of degradation are high.

7. What production system(s) does/could the output(s) focus upon?

Please tick one or more of the following options.

Leave blank if not applicable

<b>Semi-Arid</b>	<b>High potential</b>	<b>Hillside</b>	<b>Forest-Agriculture</b>	<b>Peri-urban</b>	<b>Land water</b>	<b>Tropical moist forest</b>	<b>Cross-cutting</b>
		x					

8. What farming system(s) does the output(s) focus upon?

Please tick one or more of the following options (see Annex B for definitions).

Leave blank if not applicable

<b>Smallholder rainfed humid</b>	<b>Irrigated</b>	<b>Wetland rice based</b>	<b>Smallholder rainfed highland</b>	<b>Smallholder rainfed dry/cold</b>	<b>Dualistic</b>	<b>Coastal artisanal fishing</b>
x			x			

9. How could value be added to the output or additional constraints faced by poor people addressed by clustering this output with research outputs from other sources (RNRRS and non RNRRS)?

Please specify what other outputs your output(s) could be clustered. At this point you should make reference to the circulated list of RNRRS outputs for which proformas are currently being prepared.

Considerable value has already been added to the original R6525. However, two suggestions are given here for the Outputs:

(1) Systems framework. The missing element is a validated approach to valuation – financially, culturally and socially – of the trade-offs made by local people in deciding how to use their soils and how far depletion of the natural capital is essential for survival. Social networks have been shown especially to be important – the ‘safety net’ for poor people in marginal areas – but we do not have a way of establishing their value. This is important in policy terms so that appropriate resources can be channelled to such aspects as protecting local knowledge, assistance with self-help groups and NGOs. In one of the Bolivian extensions to R6525, funded by NRSP as R7856, it was conclusively shown that social networks are fundamental to the survival of the very poor.

(2) Practical field handbook. The two versions (Spanish and English) are now very widely used. However, the techniques now need to be developed further to engage at different scales of analysis. A start has been made in

this with the GEF-LADA (Land Degradation Assessment in Drylands) project, but the methodology has further to go. The following conceptual diagram has been developed for LADA to illustrate how the process may occur (Source: *LADA Virtual Centre*).



## Validation

### B. *Validation of the research output(s)*

#### 10. *How were the output(s) validated and who validated them?*

The Outputs have been validated through a series of training courses (six in total: Sri Lanka, Bolivia, Uganda and three in UK/Spain) involving 82 participants with independent evaluators and an evaluation questionnaire. Full reports in PDF are available from Michael Stocking ([m.stocking@uea.ac.uk](mailto:m.stocking@uea.ac.uk)) for training courses in 2003, 2004 and 2005, organised by the ODG in the UK and Spain. There are also independent evaluation reports for Bolivia and Uganda.

The trainees were professionals from research institutes, NGOs, universities, government departments and multilaterals. Most of them undertook the training because of their work programmes involving interaction with local people. Across the six training courses, the gender balance was: 68% male; 32% female.

A follow-up survey has been undertaken in response to the RIU programme in September-October 2006. An email was sent to the last known addresses of all persons that undertook the training exercises in 2003-2005.

Response was patchy, but where significant uptake of outputs was claimed a follow-up telephone interview was undertaken. Responses are included below.

#### 11. **Where and when** have the output(s) been validated?

1. Hill Lands, Sri Lanka, based at Kandy: Here the outputs were tested and validated for the first time over two weeks by a group of 12 Sri Lankan local professionals in 1997. The field assessments were done in Hagarunketha District with approximately 35 local hillside, marginal farmers directly involved.
2. Cochabamba, Bolivia: Biophysical and Economic Assessment of Soil Erosion and Conservation Workshop, November 1998. At the PROINPA Experimental Station near Cochabamba. Materials and products were translated into Spanish and the workshop conducted in both English and Spanish. 22 participants from 15 Bolivian institutions including rural development workers. A hard copy of the evaluation report is available.
3. Mbarara, Uganda: Techniques for field assessment of land degradation workshop, February 2001. 19 Ugandan professionals from governmental, educational and research institutions, including the Ugandan senior soil scientist and a professor from Makerere. Field techniques were evaluated at Bushwere, where slopes of 60% occur and there is very evident land degradation. A video was taken for Ugandan TV. An evaluation report is available in hard copy and by email attachment.
4. Norwich, UK & Murcia, Spain: three international workshops on Field Assessment of Land Degradation from a Livelihoods Perspective. In 2003, 2004 and 2005. Participants were drawn from many countries and types of institution. Sponsorship was provided for some from Africa and China by UNU. Evaluation reports are available for each of these sessions by email. Responses to the follow-up survey of these participants are included below.

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## Current Situation

### C. **Current situation**

#### 12. **How and by whom** are the outputs currently being used? Please give a brief description

The approach has been used in other natural resources and conservation areas, including in biodiversity conservation on-farm (see Brookfield, H., Stocking, M. & Brookfield, M. 2002. Guidelines on agrodiversity assessment. In: Brookfield et al (eds.) Cultivating Biodiversity: Understanding, Analysing and Using Agricultural Diversity. ITDG, London. Pp.41-56).

As at 13 October 2006, Google Scholar lists 33 citations for the main printed handbook by Stocking and Murnaghan, and a further 8 citations for the preliminary on-line web version. A selection of the topics for which the outputs were relevant and cited as guidance are:

1. Participatory selection process for indicators of rangeland condition in the Kalahari
2. Soil Degradation Assessment in Mixed Farming Systems of Southern Africa: Use of Nutrient Balance ...
3. Facilitating grass-roots sustainable development through sustainability indicators: a Kalahari case ...

4. Water, land and health in urban and peri-urban food production: the case of Kano, Nigeria –
5. Diversity: A new strategic direction for soil conservation
6. Headwater deforestation: a challenge for environmental management
7. Reducing soil erosion and the loss of soil fertility for environmentally-sustainable agricultural ...
8. Integrating Methods for Developing Sustainability Indicators to Facilitate Learning and Action –
9. An adaptive learning process for developing and applying sustainability indicators with local ...
10. Promoting agrodiversity: the case of UNU project on people, land management and environmental change ...
11. Integrating Community And Scientific Sustainability Indicators To Facilitate Participatory ...
12. Demographic and Landscape Change in the Lake Patzcuaro Basin, Mexico: Abandoning the Garden
13. Ecological Degradation and Global Change: The Case of Drylands
14. Participatory Indicator Development for Sustainable Natural Resource Management
15. Assessing Land Degradation In The Monduli District, Northern Tanzania
16. Land Degradation Assessment By Farmers In Bolivian Mountain Valleys
17. Is it worth to recuperate degraded pasturelands?
18. ¿ Vale la Pena Recuperar Pasturas Degradadas? Una Evaluación desde la Perspectiva de los ...
19. Población humana y usos del suelo en las zonas áridas, semiáridas y seco-subhúmedas
20. Aspectos socioeconómicos y biofísicos de la desertificación
21. Beneficios y costos de la rehabilitación de pasturas degradadas en Honduras
22. Socio-economic factors in soil erosion and conservation

The following are a selection of the anecdotal responses to the most recent survey of users. Country and profession of respondent are indicated in square brackets:

1. “I have been using the course material and the book that we got to teach my students at Bunda College a course called Land Use Planning. Especially the use of the Livelihood framework in Land Degradation has been very useful including the different and interesting measurements of soil loss and land degradation that was taught on the course.” [Malawi, University teacher]
2. “We have developed two projects “LDC-SIDS Targeted Portfolio Approach to Sustainable Land Management” and “Preventing land degradation in Ecosystems through SLM (demonstration project)”, which will provide a platform for the collection of field data relating to loss of top-soil as well as monitoring of land degradation on a yearly basis.” [Barbados, government scientist]
3. “I shared the knowledge with departmental colleagues, including the book. So the concepts and techniques of how to confront the land degradation, learned from you are now used by our institution. 2 colleagues, agronomic engineer both, received the book and information from me. Beside at least 30 undergraduate students have received information of land degradation.” [Venezuela, University teacher]
4. “We conducted a study in the lowlands of Eritrea designing a simple community managed monitoring tool for natural resource degradation. Methods were pulled out directly from this book. Another study determined to understand the reasons why, through farmers perceptions, certain SWC measures were more acceptable than others. The simple monitoring tools for land degradation from the book will be used to measure the differences that different SWC measures have on erosion – and hence crop productivity.” [Eritrea, sustainable land management project officer]



Plus another six quotations available on request

13. **Where** are the outputs currently being used? As with Question 11 please indicate place(s) and countries where the outputs are being used.

Uptake of the tools has been achieved in other projects. Two examples known to Michael Stocking and for which details have been provided are:

- *Land Degradation Assessment in Drylands (LADA) project*. This was a major GEF-funded project, executed by the UN Food and Agriculture Organization, with a total budget of US\$12 million. It adopted the field training tools developed by R6525 and used them for local level assessments of land degradation in LADA's six countries: Algeria, Argentina, China, Cuba, Senegal, South Africa (see <http://www.fao.org/ag/agl/agll/lada>). LADA is having a workshop in Rome in late November to integrate these tools with techniques such as visual soil assessments, to provide a package for countries to upscale the products.

- *Sustainable Land Management in the High Pamir and Pamir-Alai Mountains (Kyrgyzstan and Tajikistan) – an Integrated and Transboundary Initiative in Central Asia*. This GEF-funded project, implemented by UNEP and the two national governments, has adopted the field training approaches from the R6525 handbooks. Materials are being translated into Russian for use in 2006-2008. This project is having an inception meeting in Bishkek in December 2006.

14. **What is the scale of current use?** Indicating how quickly use was established and whether usage is still spreading.

It is difficult to assess the scale of current use.

An assessment from survey responses and the course evaluations from 2003-2005 suggest that:

- Techniques in use in 26 countries with six more (China, Algeria, Cuba, Argentina, South Africa, Senegal) in *LADA* and 2 more (Tajikistan and Kyrgyzstan) in the Pamirs shortly to commence. This includes 12 countries of Sub-Saharan Africa.
- In addition to the 82 professionals directly involved to date, at least 150 more (mostly students) have been exposed to the techniques.

Uptake to current use has been slow but progressive over the 7 years since the completion of R6525. However, R6525's output was not yet in finished usable form and so development has also been progressive. An estimate of take-up time after completion of outputs is a minimum of three years for the techniques to become mainstreamed and put into practical operation.

15. **In your experience what programmes, platforms, policy, institutional structures exist that have assisted with the promotion and/or adoption of the output(s) proposed here and in terms of capacity strengthening what do you see as the key facts of success?**

A very wide range. The following are the institutions that have reported direct use:

Multilateral:

United Nations University;  
UN Food and Agriculture Organization;  
United Nations Environment Programme  
CAFOD Relief agency in SSA country programmes

#### National

Sustainable Soil Management Programme, Kathmandu Nepal;  
Marie Curie Research Fellow, CIRAD, France  
Kerala Forest Research Institute, Trichur, India  
Sustainable Land Management Programme, Asmara, Eritrea  
Environment Unit, Bridgetown, Barbados  
Earth Institute, Colombia University, New York  
Bunda College, Malawi

The programmes and platforms that have been most influential have been in higher education at national level and in targeted research in multilateral institutions.

The key facts of success are:

- (1) identifying a relevant use for an articulated demand
- (2) motivated and keen national staff to promote and utilise the tools
- (3) good communication strategies with demonstrable use and uptake
- (4) recognised and authoritative champions.

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## Current Promotion

### **D. Current promotion/uptake pathways**

**16. Where** is promotion currently taking place? Please indicate for each country specified detail what promotion is taking place, by whom and indicate the scale of current promotion

See answer as for Q15 as to where promotion is currently taking place. Specified detail is not available without further research outside this scoping study.

However, more information has been gathered on the two multilateral projects that have taken up the techniques, as follows:

*Land Degradation Assessment in Drylands (LADA) project.* For FAO in 6 countries, three of which are in Africa. Current promotion in train or planned for 2007 is training in the tools and techniques, including livelihood analysis for at least 15 professional per country (=80 persons)

*Sustainable Land Management in the High Pamir and Pamir-Alai Mountains (Kyrgyzstan and Tajikistan) – an Integrated and Transboundary Initiative in Central Asia.* Promotion in planning for 2007-8 to include at least ten professionals in 12 communities in the Pamirs, as a pilot before fuller implementation in 2009.

*17. What are the current barriers preventing or slowing the adoption of the output(s)?*

The following have been reported during telephone interviews:

**Policy barriers:** the fractured institutional responsibilities for environment and development, and for interdisciplinary techniques, is a major problem. People at senior level are reluctant to take policy leadership in a topic that cross-cuts responsibilities.

**Language:** to reach local professionals, local language materials are essential. DFID-China requested translation into Mandarin for their joint work with GEF-ADB partnership on Land Degradation in the six poorest provinces of China. Funding was then problematic for the policy reasons above. But without local language tools and guidance, there will be no take up.

**Educational barriers:** traditional disciplinary training and education has led to difficulties in accepting socio-economic techniques such as trade-off analysis, stakeholder analysis and livelihood analysis.

**Poor career prospects:** this is common to almost every other output, but is especially common in techniques and tools that cross disciplinary boundaries. There are few career rewards for using and applying such tools.

*18. What changes are needed to remove/reduce these barriers to adoption?*

More translations of the materials into national languages. An Arabic version is nearly complete, undertaken by staff at ICARDA, Syria.

Policy, institutional and educational barriers all take time to be surmounted. It needs national champions, a suitable springboard institution and clear external policy support.

A respondent from Barbados typifies the needs felt by many professionals when faced with interdisciplinary tools of analysis: "Unfortunately the agency with greatest responsibility for the monitoring of land degradation is the Ministry of Agriculture, which is a separate entity from the ministry where I work, so any advances made in utilizing the information I learned will have to be done through a collaborative project. Such projects are almost impossible to get accepted with the present institutional structures and barriers between ministries and departments."

*19. What lessons have you learnt about the best ways to get the outputs used by the largest number of poor people?*

Show the utility and demonstrate the application in practice. If local professionals are enthused, then local people including the poor join in and contribute. Then, thinking specifically of the institutions involved (these comments adapted from the Node:Suite analysis):

- For NRSP/RNRRS, the research supported the value of investing in the development of tools and approaches for natural resource assessment. These can have widespread uptake if empirical testing and validation are combined with effective promotion and dissemination strategies and capacity building of key professionals.
- For DFID, the research showed that an issue identified from bilateral aid projects – in this case soil erosion in

Sri Lanka – could be investigated efficiently through a centrally-funded research programme, tested and validated locally for the benefit of local target audiences, and then promoted more widely for expanded uptake and impact.

- For development institutions, the research indicated that it was possible to integrate environmental and economic issues that were important to local farmers and use the assessments to inform appropriate development interventions. However, agencies need to be aware that the findings from this approach may run counter to those from standard professional approaches and result in the recommendation of technologies that are not usually viewed as biophysically efficient.

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## Impacts On Poverty

### ***E. Impacts on poverty to date***

#### *20. Where have impact studies on poverty in relation to this output or cluster of outputs taken place?*

No specific, formal and detailed studies of impact on poverty have been undertaken. The key challenge is how the potential of the production systems upon which the poor rely can be realised in order to support these marginalised sections of society in often remote areas of mountains and steep slopes. An initial step for the original research was to develop and test tools for the assessment of environmental processes, such as soil erosion, that directly impact hillside farmers. These tools had to be able to provide assessment outputs that are relevant to and understandable by farmers. The tools needed to be able to integrate economic and financial issues with environmental and biophysical processes. They also needed to be low-cost, participatory and accessible to local professionals working with farmers.

The survey undertaken for this RIU contribution included questions on poverty impact, as reported below.

#### *21. Based on the evidence in the studies listed above, for each country detail how the poor have benefited from the application and/or adoption of the output(s)*

It must be appreciated that the benefit to poor people comes primarily from better trained and more useful local professionals. Some of this is dealt with below in Q22. It is impossible to give the sort of statistical evidence requested in this Question 21 – a substantial follow-up study would be needed. Here, we report responses to the RIU survey, but it should be noted that very few evidences of direct benefit for the poor have been reported to date:

From Nepal: “There has been no direct validation of impact on poverty. However, there are evidences [of] increased income through integration of economic activities into the land management practices (e.g. compost making and selling to market)”. In a recent review mission to Nepal, uptake of techniques to reduce land degradation rates (mainly soil erosion) on hillside terraces suggests that there has been a preferential take-up by poor people rather than the more locally wealthy. The reasons advanced were mainly centred around the reliance that poor people place directly on the integrity of their natural resource base. This is an untested argument, but

would be worthwhile following up as part of an integrated poverty strategy in the NR and agricultural sectors.

From Central Asia: “The implementation of the above-mentioned project has not started yet but they are expected to have tangible positive impacts on both the local livelihoods and environment.”

From India: “From my experience in my research work, I have made observations (both quantitative and qualitative) that there is a very strong correlation between land degradation (in our case it was through analysis of land use analysis in marginal lands) and poverty. Some of these observations have been published. However, more substantial questions such as why marginal lands are cultivated and why in some cases (in our study area) suboptimal land use occurs. The balance between land degradation and livelihoods of subsistence farmers has to be found through alternative activities, off farm income sources mainly aided by a supportive and enabling policy instruments.”

Indirectly reported by one of the LADA local professionals in Senegal from the minutes of an FAO meeting: “Land degradation assessment is essential in the drylands of West Africa in order to meet the aspirations of local people to have technologies designed for their particularly harsh conditions.”

Finally, it is worth noting statements made about the veracity of assessments of the status of the environment and the linkage to poor people.....

Bjorn Lomborg as reported in *New Agriculturist*. “.....environmental organisations deliberately misrepresent statistical evidence in order to give an exaggerated picture of environmental dangers. Whether the subject is food production, forest depletion, or water scarcity, [Lomborg, himself a statistician, argues that] the world is in a far better state than is generally admitted, and that on the whole, prospects for the future are of continuing improvement. Those areas where trends are least encouraging are the poorest areas. Countries burdened by huge debts cannot afford to think long term; nor can farmers living below the poverty line. Uncontrolled and damaging exploitation of natural resources may be their only option for survival and, since only rich people can afford the luxury of environmental conservation, if the world wishes to prevent further destruction, it must support the long term economic growth of the poor.

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## Environmental Impact

### **H. Environmental impact**

*24. What are the direct and indirect environmental benefits related to the output(s) and their outcome(s)?*

*This could include direct benefits from the application of the technology or policy action with local governments or multinational agencies to create environmentally sound policies or programmes. Any supporting and appropriate evidence can be provided in the form of an annex.*

The tools and techniques are intrinsically ‘environmental’ and are about the promotion of sustainable use. It is useful to note that the widest take-up has been through projects funded by the Global Environment Facility. This

implies that the analytical techniques are accepted as useful for environmental goals.

25. *Are there any adverse environmental impacts related to the output(s) and their outcome(s)?*

No.

26. *Do the outputs increase the capacity of poor people to cope with the effects of climate change, reduce the risks of natural disasters and increase their resilience?*

NRSP ran a final project on adaptation to climate change (R8494) with the view to enhancing adaptive capacity. The following is an edited version of the Key Messages statement by Michael Mortimore and Adam Manvell, made relevant for land degradation assessment:

Helping poor people to strengthen their livelihoods improves their capacity to adapt to variability (the most urgent symptom of climate change). Land degradation discriminates between different areas. It is greatest on steep lands and difficult climates, where most poor people also live.

The capabilities of poor people, rather than their vulnerability *per se*, provide a starting point for demand-led research for development that can moderate the negative effects of climate change, and empower them to take hold of opportunities. A new research strategy is needed to provide focused scientific and external support. This strategy should evolve beyond 'more of the same' to respond flexibly to new challenges. An example of this would be the new concepts of integrated soil fertility management

Significant knowledge gaps should be addressed, in: measuring the uptake of innovations more effectively; understanding the political–economic context of development in specific times and places; understanding how poor people can optimise new knowledge in a context of competing demands; incorporating economic drivers in models and in advice; taking forward the growing understanding of institutional issues; linking livelihood diversification strategies with natural resource management; and fulfilling the need for a strategy addressing longer term ecosystem change.

A systems approach to climate change adaptation research is advocated for: combining action with research; building partnerships between research, development and policy; linking democratic accountability, governance, planning and natural resource management; identifying creative entry points in multi-sectoral livelihood systems; and combining risk reduction with productivity objectives. Linking land degradation and production (or yield) decline is an urgent priority.

It is important to optimise the management of a diminishing natural resources sector. Robust, diversified livelihoods have good adaptive capacity (there are trade-offs with risky specialisation). Success in building livelihoods often correlates with access to non-farm options, and income may be transferred between the two sectors. Poor people therefore need to increase the income share derived off-farm and research should reflect a multi-sectoral

standpoint.

Links with regional partners (to ensure effective uptake) need to be defined and formed between climate change adaptation research and related activities, and between scales ranging from the local (where much of the research has been conducted) to the global (where policy debates are active and instruments such as conventions are formed).

(Source: Mortimore and Manvell, 2006, p.1)

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