Impact Monitoring & Assessment

Instruments for
Use in Rural Development Projects with
a Focus on Sustainable Land Management

Volume 2: Toolbox

Karl Herweg & Kurt Steiner

2002

IMPACT MONITORING & ASSESSMENT

Instruments for
Use in Rural Development Projects with
a Focus on Sustainable Land Management

Volume 2: Toolbox

Authors: Karl Herweg (CDE), Kurt Steiner (GTZ)

Contributing Institutions:
Centre for Development and Environment (CDE, Switzerland), Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ, Germany), Swiss Agency for Development and Cooperation (SDC, Switzerland), Intercooperation (Switzerland), Helvetas (Switzerland), Rural Development Department of the World Bank

Contributors (in alphabetical order):
Peter Bieler (SDC), Lukas Frey (CDE), Markus Giger (CDE), Matthias Görgen (consultant), Charl Goodwin (Dpt. of Land Affairs, RSA), N.R. Jagannath (SDC, Bangalore, India), Andreas Kläy (CDE), Adrian Maître (Intercooperation, ATICA, Bolivia), Peter Meier (SDC), Hans-Peter Müller (SDC, PDR Korea), Dieter Nill (consultant), Cordula Ott (CDE), Stephan Rist (CDE), Jochen Schmitz (Helvetas), Kai Schrader (consultant), Sigfrid Schröder-Breitschuh (GTZ), Francis Shaxson (consultant), Thomas Stadtmüller (Intercooperation), Brigitta Stillhardt (CDE), Georg Weber (Intercooperation, Nepal)

Layout: Lukas Frey

Drawings & Cartoons: Karl Herweg

Printed by: Buri Druck AG, 3084 Wabern, Switzerland

ISBN: 3–906151–59–X

Please address comments, suggestions, orders, etc. to:

Dr. Karl Herweg
Centre for Development and Environment
Hallerstr. 12
CH-3012 Bern
Tel.: +41 31 631 88 22
Fax: +41 31 631 85 44
E-mail: herweg@giub.unibe.ch

Dr. Kurt Steiner
GTZ
Dag-Hammarskjöld-Weg 1-5
D-65760 Eschborn
Tel. & Fax: +49 6196 79 10 81
E-mail: kurt.steiner@gtz.de

Table of Contents


WE'VE BUILT THESE LATRINES TO IMPROVE OVERALL HYGIENE!
INDEED..., THE TOOLS LOOK CLEAN...

Step 1: Involvement of Stakeholders and Information Management

NARMS (Pilot Project Natural Resource Management by Self-help Promotion) **1996**. Process Monitoring (ProM), Work Document for project staff, GTZ, department 402, (402/96, 22e NARMS); Eschborn.

PASOLAC / INTERCOOPERATION **1999**. Evaluación participativa por productores. Programa para la agricultura sostenible en laderas de América Central; Doc. No. 216: 58 p.; Managua.

PASOLAC / INTERCOOPERATION **1999**. Evaluación participativa por productores. Programa para la agricultura sostenible en laderas de América Central; Doc. No. 200: 33 p.; San Salvador.

Pretty, J.N., Guijt, I., Thompson, J., Scoones, I. **1995**. Participatory Learning and Action. A Trainer's Guide. IIED Participatory Methodology Series; London.

PROASEL / INTERCOOPERATION **1999**. Evaluación participativa por productores. Programa Suizo con organizaciones privadas para la agricultura sostenible en laderas de América Central; Doc. No. 57: 30 p.; Tegucigalpa.

Schönhuth, M., Kievelitz, U. **1994**. Participatory Learning Approaches – Rapid Rural Appraisal; Participatory Appraisal; An Introductory Guide. Ed. GTZ. Schriftenreihe No. 248.

Zweifel, H. **1998**. The realities of gender in sustainable land management. Inputs for reflection and action. Development and Environment Reports, No. 16: 54 p.; Bern.

Matrix: Stakeholders and Information Management

Stakeholders	Provision of information	Information needs	Preferred form / media	Dissemination	Storage

Step 2: Review of Problem Analysis

Participatory Systems Analysis

Objective and Brief Description of the Method

A network or systems analysis is more appropriate than a simple cause-effect analysis for understanding how a project context functions, why problems occur, why an intervention does or does not lead to achieving a goal, etc. However, a sound scientific systems analysis would be too costly and too complicated for most development projects. In this sense, the Participatory Systems Analysis (PSA) presented here is a manageable compromise.

PSA led to interesting results in several workshops. A variety of stakeholders defined important elements of a project context and their relationships during a participatory exercise, based on their specific backgrounds, knowledge, expertise and experiences. After some initial astonishment and learning about how different perceptions of the same context can be, PSA always stimulated fascinating discussions among participants. It is a good starting point for obtaining more complex views of reality, particularly for people with little experience in systems thinking. PSA is a first step in moving away from "repair-shop thinking" towards more flexible management of an unpredictable project context.

PSA complements problem analysis (e.g. problem tree), it serves as a basis for further project planning, and finally, it helps to structure the project planning matrix. It is designed to evaluate the relationships among relevant elements within a project context. It reveals which elements can be potential starting points for project activities, and which ones may require further investigation and better understanding (e.g. field trips, discussions, interviews, transect walks; cf. Step 5).

PSA is neither a mathematical model nor a scientific method and does not reveal a "right" or "wrong" way of looking at a project context. Rather it reflects the perceptions and knowledge of the participants. The more seriously the elements are chosen and their relationships are evaluated, the more realistic will be the results.

Procedure / Steps – and an Explanatory Example

(1) Setting the stage

- The exercise should be carried out in groups with no less than 5 or 6 persons, in order to incorporate differing points of view and to stimulate worthwhile discussions. Homogeneous groups are likely to arrive at the expected results and may miss the chance to look at the context from different angles! Even though the ratings of the relationships are done jointly, the results can often be surprising and provoke a debate. This may require a repetition of the exercise with improved ratings.

- A participatory systems analysis can be carried out with a random number of elements, but our experience indicates that the optimal number is 12. Less than 12 elements may not represent the complexity of the context sufficiently, while more than 12 elements are difficult to manage in a short time.
- In order to incorporate the idea of "sustainability", we propose including all dimensions of sustainability. In the example, we have selected 4 ecological, 4 economic and 4 social / institutional elements. But the number of elements in each dimension does not need to be 4; it can vary according to the project context. It is more important that no dimension be neglected if sustainable development or sustainable resource management is mentioned in the project goal or purpose.
- The ratings (2 = strong influence; 1 = moderate influence; 0.5 = weak influence; 0.1 = very weak influence) are experiential values and do not reflect scientific knowledge. They may be changed, but this will only influence the scales and not the relative location in the system of co-ordinates. The rating 0 (= no influence) cannot be used because calculations include a division. All elements in a system are assumed to have at least a weak and indirect influence on each other.

(2) Selecting the elements of the project context

The elements of the project context in question are listed. The justification of a selection is the basis for a common understanding of why exactly these elements were chosen and how the relationships were estimated. It is particularly helpful at a later stage when details will be forgotten.

Example

Selection of important elements in a project context: a smallholder village in the rangelands of the southern part of Africa. The elements represent the three dimensions of sustainability.

No.	Dimension of sustainability	Element	Description / Justification
1	Ecological	Water availability	Low due to rainfall, no maintenance of supply pipeline
2		Overgrazing	Low rainfall and uncontrolled grazing
3		Soil erosion	High on crop and grazing land
4		Water quality	Poor because wells are not maintained
5	Economic	Household (HH) income	Low due to declining yields and market prices
6		Off-farm jobs	Limited, no small-scale industries, handicrafts, etc.
7		Crop production	Low due to subsistence agriculture, no external inputs
8		Distance to market	Difficulties in marketing of products
9	Social / institutional	Level of education	Low because teachers not motivated to work here
10		Social conflicts	Increasing social disparities
11		Access to land	Limited due to insecure land use rights
12		Innovative potential	Low due to out-migration of young men

Matrix: Participatory Systems Analysis

No.		1	2	3	4	5	6	7	8	9	10	11	12		
	Elements													**Active sum (AS)**	**Degree of interrel. (AS·PS)**
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
12															
	Passive sum (PS)														
	Activity ratio (AS/PS)														

(3) Determination of the relationships between all elements: completing the matrix

Rating:

2.0 strong influence
1.0 moderate influence
0.5 weak influence
0.1 very weak influence

The basis for the PSA is the matrix presented on the previous page. To fill in the matrix, it is important to start with **line No. 1** (not the column!) and to ask: **what is the "influence" of element No. 1 on elements No. 2 (column 2)**, No. 3 (column 3), etc. Whether the influence is positive or negative plays only a minor role at the moment. After the rating is completed, each line will reflect the influence that the element in question has on the other elements of the system. This can be called the **active** character of an element. Similarly, each **column** reflects the influence of all other elements on the element in question. This can be called the **passive** character of an element.

No.		1	2	3	...
	Elements	*Water availab.*	*Over-grazing*	*Soil erosion*	...
1	*Water availability*				
2	*Overgrazing*				
3	*Soil erosion*				
...	...				

N.B. Start with **line No. 1** and the influence of element No. 1 on elements No. 2 (column 2), No. 3 (column 3), etc.

(4) Calculation of active sum and passive sum

Adding up all values of one **line** results in the **active sum** of the element in question.

No.		1	2		12	
	Elements	*Water availab.*	*Over-grazing*	...	*Innovative potential*	**Active sum (AS)**
1	*Water availability*		*2*	➤	*0.5*	***11.9***
2	...	...		...	...	**...**

Adding up all values of one **column** results in the **passive sum** of this element.

No.		1	2
	Elements	*Water availab.*	...
1	*Water availability*		...
2	*Overgrazing*	2	
...	...		...
12	*Innovative potential*	2	...
	Passive sum (PS)	***8.0***	**...**

(5) Calculation of the degree of interrelation and the activity ratio

Multiplying the active sum by the passive sum of each element gives its **degree of interrelation** within the system. This reflects how strongly or how weakly an element is "networking" within the project context. A high degree of interrelation implies, for example, that there are many direct and indirect ways to influence this element.

Dividing the active sum of each element by its passive sum gives its **activity ratio**. This reflects the proportion of active influences and passive influences in each element and indicates whether an element plays a rather active role (> 1) or a rather passive role (< 1) within the project context. Passive elements, for example, are not the best starting points for changing a context.

No.		1	...	12		
	Elements	*Water availab.*	...	*Innovative potential*	**Active sum (AS)**	**Deg. of interrel. (AS·PS)**
1	*Water availability*		...	...	***11.9***	***95.2***
...	...	...	...	...	...	...
12	*Innovative potential*	...	...		***10.3***	***80.3***
	Passive sum (PS)	***8.0***	**...**	***7.8***		
	Activity ratio (AS/PS)	***1.5***	**...**	***1.3***		

Participatory systems analysis: a complete rating for a smallholder village in the rangelands of the southern part of Africa

No.		1	2	3	4	5	6	7	8	9	10	11	12		
	Elements	*(WA)*	*(OG)*	*(SE)*	*(WQ)*	*(HI)*	*(OJ)*	*(CP)*	*(DM)*	*(LE)*	*(SC)*	*(AL)*	*(IP)*	**Active sum (AS)**	**Degree of interrel. (AS·PS)**
1	*Water availability (WA)*		2	1	2	2	0.1	2	0.1	0.1	2	0.1	0.5	***11.9***	***95.2***
2	*Overgrazing (OG)*	2		2	1	1	0.1	0.5	0.1	0.1	1	0.5	0.1	***8.4***	***110.0***
3	*Soil erosion (SE)*	1	1		1	2	0.1	2	0.1	0.1	0.1	0.1	0.1	***7.6***	***96.5***
4	*Water quality (WQ)*	0.1	0.1	0.1		1	0.1	0.1	0.1	1	1	0.5	0.5	***4.6***	***38.2***
5	*Household income (HI)*	1	2	0.5	1		0.1	0.5	0.1	2	2	2	0.5	***10.7***	***214.0***
6	*Off-farm jobs (OJ)*	0.1	2	2	0.5	2		0.5	0.1	2	0.5	0.5	1	***11.2***	***37.0***
7	*Crop production (CP)*	0.1	0.5	1	0.1	2	0.1		0.5	0.1	2	0.1	0.1	***6.6***	***73.3***
8	*Long distance to market (DM)*	0.1	0.5	0.1	0.1	2	0.1	0.5		2	0.1	0.1	2	***6.6***	***15.8***
9	*Level of education (LE)*	0.5	1	2	0.5	2	1	2	0.1		1	0.1	2	***12.2***	***104.9***
10	*Social conflicts (SC)*	2	1	1	1	2	1	1	1	1		2	1	***13.0***	***158.6***
11	*Access to land (AL)*	0.1	2	1	0.1	2	0.1	1	0.1	0.1	2		1	***9.5***	***48.5***
12	*Innovative potential (IP)*	2	1	2	1	2	0.5	1	0.1	0.5	0.5	0.1		***10.3***	***80.3***
	Passive sum (PS)	***8.0***	***13.1***	***12.7***	***8.3***	***20.0***	***3.3***	***11.1***	***2.4***	***8.6***	***12.2***	***5.1***	***7.8***		
	Activity ratio (AS/PS)	***1.5***	***0.6***	***0.6***	***0.6***	***0.5***	***3.4***	***0.6***	***2.8***	***1.4***	***1.1***	***1.9***	***1.3***		

(6) Establishing the system of co-ordinates

In order to get an overview of all elements and their role within the context, the **degree of interrelation** and **activity ratio** are positioned in a system of co-ordinates. This illustrates the "relative" position of each element vis-à-vis the others (cf. Figure 12).

- The **Y-axis** has a linear scale, and the length of the axis is determined by the highest **degree of interrelation** obtained in the exercise (rule of thumb: calculated maximum degree of interrelation + 20 to 30 to round it up).
- To keep the size of the system of co-ordinates small, the **X-axis** (**activity ratio**) has a logarithmic scale with a total length of 10, while the middle of the X-axis is 1.

Example *Co-ordinates of elements*

No.	Elements	Activity ratio	Degree of interrelation
1	*Water availability*	1.5	95.2
2	*Overgrazing*	0.6	110.0
3	*Soil erosion*	0.6	96.5
4	*Water quality*	0.6	38.2
5	*Household income*	0.5	214.0
6	*Off-farm jobs*	3.4	37.0
7	*Crop production*	0.6	73.3
8	*Long distance to market*	2.8	15.8
9	*Level of education*	1.4	104.9
10	*Social conflicts*	1.1	158.6
11	*Access to land*	1.9	48.5
12	*Innovative potential*	1.3	80.3

(7) Interpreting the results of the PSA

The system of co-ordinates is divided into four main sectors. Each sector implies a certain character or function within the system (see Figure 11). Note that in reality the "borders" between the four sectors are gradual transitions and not sharp lines. As all numerical values reflect the experiences and knowledge of the participants (and not a mathematical algorithm), it is the relative (and not the absolute) position of each element in relation to others that is important!

- A **symptom** is an element that is greatly influenced by other elements but may not have much power to change the system itself. Symptoms can be useful indicators of context changes, but development activities in this sector may only amount to a "treatment of the symptom, not the cause".
- A **buffer** is characterised by low importance in the context. It is rather unremarkable because it neither influences other elements much nor is it influenced much by others. Development activities in this sector are expected to have little impact on the context.

- A **critical element** is an accelerator or catalyst in the system. It changes many things quickly, but may also create many unexpected and undesired side effects. Development activities in this sector can be highly uncertain, and impacts may be unpredictable. Therefore, critical elements have to be treated very carefully. It is particularly important to formulate impact hypotheses for this sector (cf. Step 3)!
- A **motor** or **lever** is an active element with predictable impacts. This is the most interesting sector for development activities.

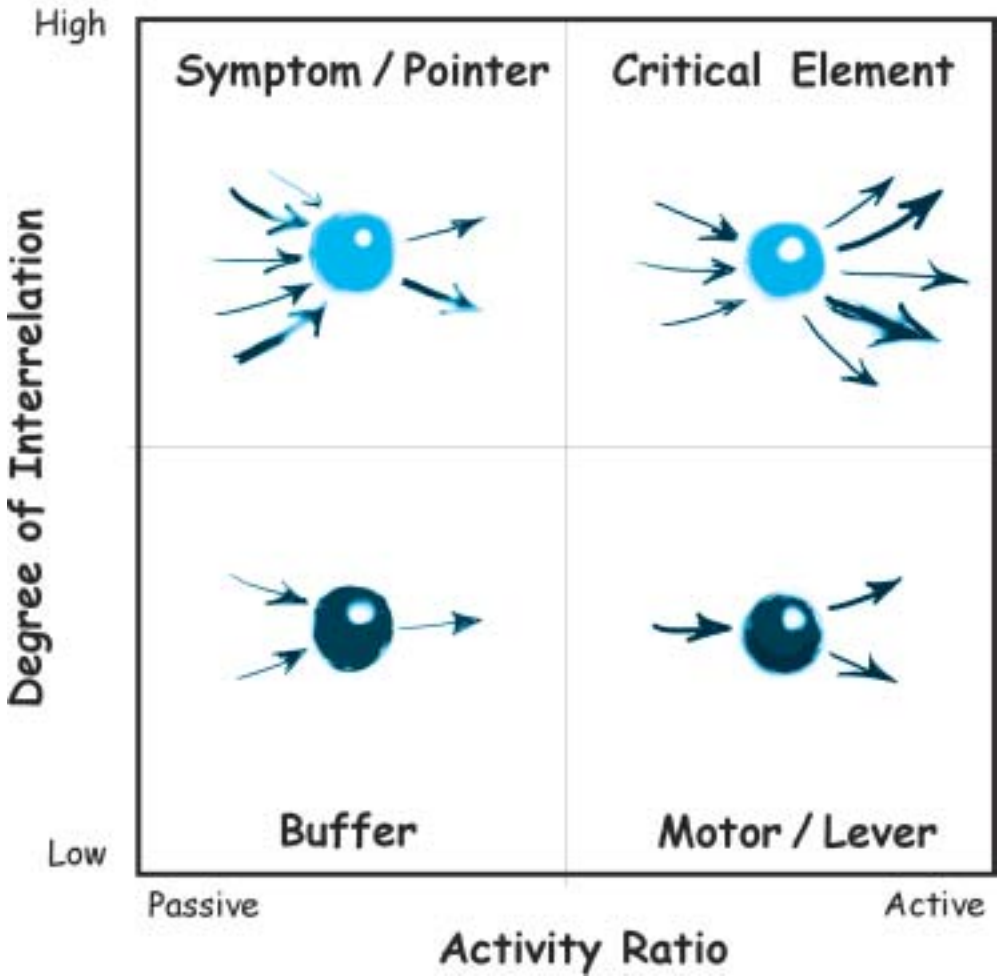


Figure 11: The functions of elements within a project context

- Elements in the two sectors on the left **(symptom & buffer)** are rather passive, i.e. they are influenced by other elements more than they influence others.
- Elements in the two sectors on the right **(critical element & motor)** are rather active, i.e. they influence other elements more than they are influenced.
- Elements in the two lower sectors **(buffer & motor)** are rather weakly interrelated.
- Elements in the two upper sectors **(symptom & critical element)** are rather highly interrelated.

Example

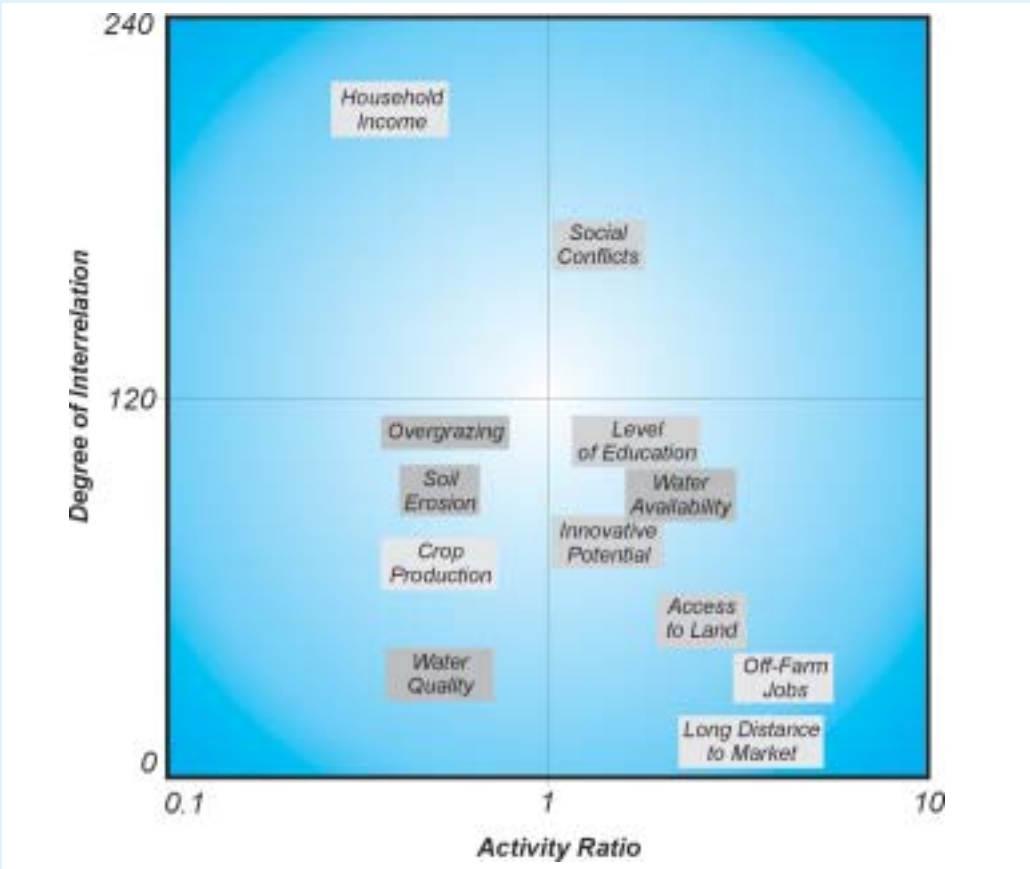


Figure 12: PSA in a Southern African rangeland context

Starting points for interpretation (Figure 12):

- *Household income appears to be a **symptom**, which means it can be influenced by many other factors. It would be a good indicator for a change in the project context.*
- *Most **buffers** are – surprisingly for some people – the ecological elements, which means that influencing them would probably alleviate the respective problem (e.g. soil erosion) but not change the context as a whole.*
- *Social conflicts are a **critical element**. Trying to solve them directly might produce unpredictable positive and negative impacts. This element requires more detailed analysis before intervening.*
- ***Motors** or **levers** of the system are mostly social / institutional and economic elements. These seem to be promising points of "intervention" for a development project. However, there is a need for careful monitoring to determine whether and how these and all other elements of the project context would change over time.*

Interpretation and conclusions based on the exercise are the subjects of an open discussion which automatically leads to Step 3, the formulation of impact hypotheses. For example, although soil erosion is characterised as a buffer in this case, some stakeholders may insist that it is a serious problem that needs to be addressed. The discussion should then focus on how to approach the problem. Erosion control may eventually be more effective if it is addressed through education and attempts to strengthen the innovative potential of the land users.

(8) Cross-checking the results

Even though the locations of the elements in the system of co-ordinates reflect the group's judgement and ratings, some results seem obvious while others may be surprising, and not everybody may agree. It must be kept in mind that the matrix and the system of co-ordinates reflect the participants' knowledge and perceptions. Therefore, there is no "right" or "wrong" way of looking at the context of a project as such, and nobody can claim to have a complete overview. Disagreements only indicate the need for further clarification and discussion. In this case, the group can cross-check the ratings again (strong, moderate, weak influence) and – if necessary and desirable – modify the matrix. Our experience indicates that this may change some details but rarely gives an entirely new picture of the system. However, the participants themselves must gain this experience in order to come to a common understanding. Disagreement should also be considered a pool of different development options for a project, which can then be treated as alternative scenarios.

Bookshelf

Messerli, P. **2000**. The Application of Sensitivity Analysis to Evaluate Key Factors for Improving Slash-and-Burn Cultivation Systems on the Eastern Escarpment of Madagascar. Mountain Research and Development 20, No. 1: pp. 32–41.

Ninck, A., Bürki, L., Hungerbühler, R., Mühlemann, H. **1988²**. Systemik – Integrales Denken, Konzipieren und Realisieren: 219 p.; Zurich.

Vester, F. **1986²**. Ballungsgebiete in der Krise. DTV: 151 p.

Step 3: Formulation of Impact Hypotheses

Examples of Impact Hypotheses: Sustainable Land Management

Sustainable land management (SLM) can be considered one of the ultimate and therefore indirect impacts of rural development projects. Formulated as a project goal or purpose, the desired situation might be "land management is more sustainable". But there is a need to clarify what is meant by "SLM". Is it increased production, decreased resource degradation, increased wealth and social well-being? SLM can be described by several dimensions of sustainability: an institutional, a social (socio-cultural), an economic, and an ecological dimension. The subdivision into dimensions prevents important aspects of sustainability from being forgotten. For practical purposes, some dimensions may be merged later on, such as socio-economic, or social / institutional.

Checklist 1: Fields of observation of sustainable land management

Level	*Dimensions of sustainability*			
	Institutional	*Socio-cultural*	*Economic*	*Ecological*
Household (including farm plot level)	• *Education and knowledge* • *Access to natural resources* • *Household strategies* • …		• *Household income, assets and consumption* • *Labour and workload* • *Land management and farming system* • …	• *State of natural resources* • …
Community	• *Local leadership* • *Local institutions* • *Producer and self-help organisations* • …	• *Gender issues* • *Conflict management* • *Innovation* • …	• *Markets, prices and credit* • *Public property* • …	• *Land use* • *Water resources* • …
		• *Social & economic disparities* • …		
District	• *Education, training and extension* • *Land and water rights, tenure* • …	• *Change in social values* • …	• *Employment opportunities / migration* • *Infrastructure* • …	• *Land cover* • *Off-site effects* • …

In the framework above (Checklist 1), SLM is segregated into "fields of observation", classified according to dimensions of sustainability and spatial decision-making levels. Attribution to a particular dimension or level may vary according to the specific project context. Elements can be formulated neutrally (e.g. socio-economic disparities), as a problem (e.g. increased disparities) or as a desired scenario (e.g. decreased disparities). They can also be used in problem analysis (cf. Step 2).

A development project may support activities related to all dimensions of sustainability, e.g. to increase the economic and social well-being of the population, to strengthen local institutions, and to develop environmental protection practices. On the following pages, Checklist 1 (fields of observation in SLM) is used as a framework (cf. Figure 13) to present examples of impact hypotheses (Step 3, Checklists 2a–2c) and impact indicators (Step 4, Checklists 3a–3c, and 4a–4c). It must be kept in mind that the checklists contain examples of hypotheses and indicators. "Positive" and "negative" formulations are context- and stakeholder-specific, which means they must always be adapted to the situation they are used in.

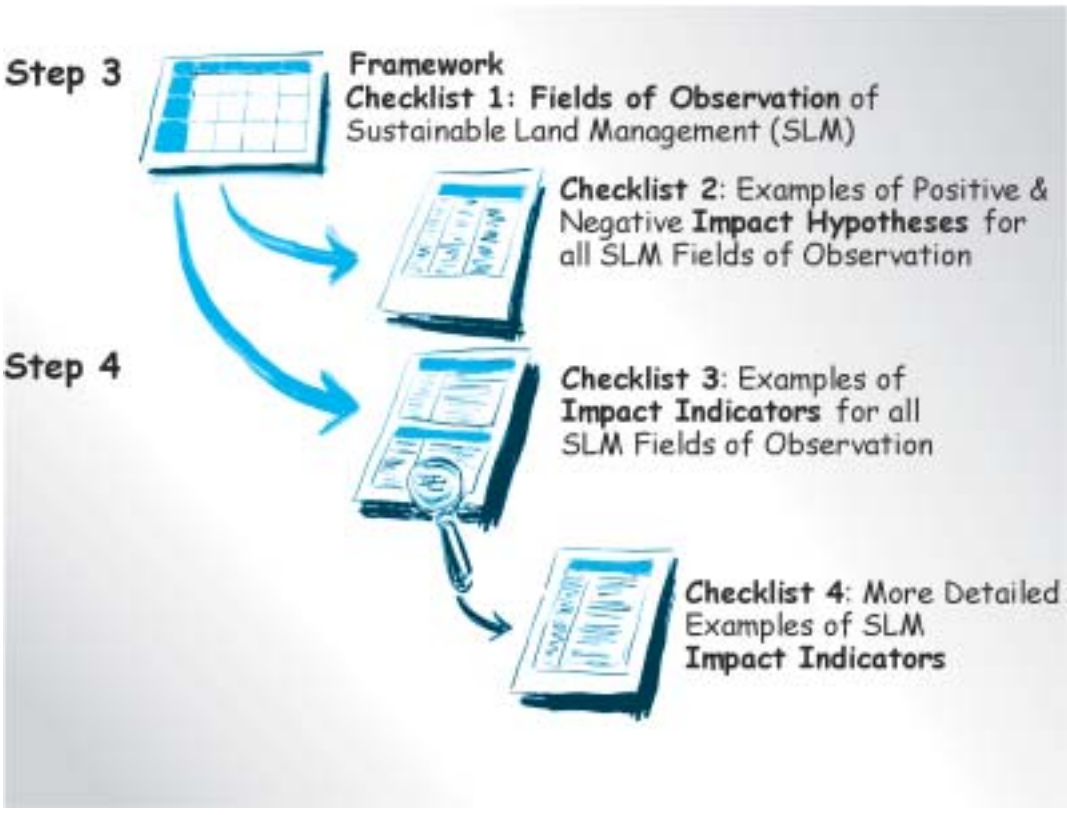


Figure 13: Checklists 1 to 4: Examples of impact hypotheses & impact indicators (Steps 3 & 4)

Checklist 2: Examples of positive and negative impact hypotheses for all SLM fields of observation

Checklist 2a: Household level (including farm plot level)		
Fields of observation of SLM	***Positive impact hypotheses***	***Negative impact hypotheses***
Education and knowledge	*Indigenous knowledge is recognised and strengthened*	*School leavers ignore local knowledge and refuse farm work*
Access to natural resources	*There is adequate and secure access to natural resources for all HH – women and men*	*Giving attention to farmers causes further marginalisation of landless people*
Household (HH) strategies	*HH give equal importance to production and protection aspects*	*Increasing market demand for certain crops leads to over-exploitation of land resources*
HH income, assets and consumption	*HH income increases; assets are increasingly re-invested in conservation-effective practices*	*Increased HH income strengthens men's dominance over women; assets are spent for consumption of alcohol and prostitution*
Labour and workload	*Labour income for women and men increases*	*Women's workload increases*
Land management and farming system	*New practices increasingly integrate production and protection*	*Production factors are used inefficiently*
State of natural resources	*Soil fertility is maintained and improved; soil degradation is minimised; agro-biodiversity is maintained; livestock rates are adapted to the carrying capacity*	*Inadequate soil and water conservation technologies increase soil degradation*

Example

Checklist 2b: Community level

Fields of observation of SLM	Positive impact hypotheses	Negative impact hypotheses
Local leadership	Local leadership permits access to resources and regulations are enforced	Conflicts among community members increase due to nepotism
Local institutions	Local institutions are actively involved in resource protection	Local institutions are an obstacle to better land management
Producer and self-help organisations	Land users increasingly organise themselves	Self-help groups are inefficient because of bad management
Gender issues	Women are increasingly organised and involved in decision-making processes	Women face problems in the family due to their commitments
Conflict management	Local institutions / regulations for conflict management are functional	Conflicts are used by influential groups to maintain their position
Social and economic disparities	Social and economic disparities decrease	Profitable production encourages influential stakeholders to appropriate land
Innovation	Experimentation and innovation are recognised as integral parts of the land management system; innovators are socially accepted	Innovators are socially isolated
Markets, prices and credit	Products are sold at a profit and necessary inputs are available	Repair services for maintenance of new technologies are not available
Land use	Land use becomes more conservation-effective, i.e. degradation processes are controlled	Reduced grazing on private land triggers degradation of communal pasture land
Water resources	Sufficient water of adequate quality is always available	Water resources are not equally available to all community members

Example

Checklist 2c: District level

Fields of observation of SLM	*Positive impact hypotheses*	*Negative impact hypotheses*
Education, training and extension	*Extensionists, teachers, land users and children are increasingly trained in sustainable land management*	*Indigenous knowledge is marginalised by formal education*
Land and water rights, tenure	*Rural population is increasingly involved in decision-making regarding land and water rights*	*By-laws are not enforced*
Change in social values	*Social control and negotiation mechanisms are maintained despite changes in social values*	*The younger generation loses its orientation and social roots*
Employment opportunities / migration	*Non-agricultural employment opportunities improve*	*Out-migration from the villages (loss of indigenous knowledge) increases due to more attractive income opportunities*
Infrastructure	*Infrastructure (roads, markets, transport, banking, etc.) improves and supports sustainable land management*	*Prostitution, diseases, drug trafficking and crime spread quickly*
Land cover	*Vegetative cover of the land increases*	*Farming expands to marginal lands due to higher product prices*
Off-site effects	*Off-site effects of resource degradation decrease*	*Floods affecting urban centres increase due to reduced land cover; water reservoirs are filled with sediment*


PM
PPM

Step 4: Selection of Impact Indicators

Examples of Impact Indicators: Sustainable Land Management

Checklist 3: Examples of impact indicators for all SLM fields of observation

Checklist 3a: Household level	
Fields of observation of SLM	***Impact indicators***
Education and knowledge	*% of school children / No. of school drop-outs (separate for boys and girls), No. of people with school leaving certificate*
Access to natural resources	*No. and size of plots managed by women and men, management of communal land*
Household (HH) strategies	*HH structure, labour division, changes in perceptions and behaviour, innovations*
HH income, assets and consumption	*HH income, male and female earnings, gross margins, clothing, housing, nutrition, purchasing power, spending power, months of food security, re-investment in new farm implements, seeds, etc.*
Labour and workload	*Labour division, labour income*
Land management & farming system	*Labour income, change in farming system, adapted farming practices, abandoned technologies, application rate of conservation-effective practices*
State of natural resources	*Soil fertility status, soil erosion, salinity, compaction, water availability and water quality, biodiversity, plant growth, plant cover, pests & diseases, No. and quality of animals*

N.B. that the formulation of the impact indicators needs to be adapted to the specific project situation!

Example

Checklist 3b: Community level

Fields of observation of SLM	Impact indicators
Local leadership	Access to natural resources by women / men, actions taken when local by-laws are neglected
Local institutions	Active participation, survival rates of trees, conservation structures maintained without incentive, representation of social strata
Producer and self-help organisations	No. of farmers' associations, representation of social strata
Gender issues	% of women in decision-making institutions and meetings, % of women with land titles; gender-specific access to credit, workload, income
Conflict management	Conflicts over natural resources, taboos with regulatory character, binding local agreements
Social and economic disparities	Wealth, status of minorities, clothing, housing, % of landless people
Innovation	No. of innovative technologies, social status of innovators
Markets, prices and credit	Distance to markets, new shops and businesses, No. of credits, interest rates
Land use	% of cropland, pasture, forest / bush land & other, visible signs of resource degradation, deforestation rate, cultivation of marginal land, overgrazing, abandonment of cropland
Water resources	No. of people suffering from water-borne diseases; No. of conflicts over water resources, water colour, months when springs and rivers have water

Example

Checklist 3c: District level

Fields of observation of SLM	Impact indicators
Education, training and extension	District radio programmes with environmental messages, farmers' and school children's environmental awareness
Land and water rights, tenure	Environmental laws, regulations, land titles, land price, local taboos with regulatory character, enforcement of regulations
Change in social values	Crime, conflicts between generations; social status of farmers
Employment opportunities / migration	Unemployment rate, vacancies, in- & out-migration, No. of female HH heads
Infrastructure	Access to markets, schools, services, credit, scholars per family, frequency, price and reliability of transport, frequency of power cuts
Land cover	% of crop, pasture, forest land
Off-site effects	Flash floods, sedimentation of dams, water quality, destruction of roads and bridges

Checklist 4: More detailed examples of SLM impact indicators

Checklist 4a: Institutional, socio-cultural, and economic aspects of SLM

Institutional / socio-cultural aspects	
Education and knowledge	*% of school children / No. of school drop-outs (separate for boys and girls), No. of people with school leaving certificate, % of illiterate people per social strata, No. of women and men with further education & training, success rate (people trained with certificate), No. of people applying their training, No. of people instructed by those who received training (self-dissemination)*
Access to resources (natural, financial, agri-services, information)	*No. of households (HH) with owned, rented and leased land, land holding size per social strata (e.g. poor farms, wealthy farms), use of credits, use of production inputs*
Institutions, organisational capacity, management	*No. of planned development activities carried out, rate of uncompleted workdays, duration of administrative procedures, transparency of administrative procedures, application of laws and by-laws (e.g. tax recovery, declared and sanctioned violations), public reputation of institutions, No. of binding / respected local agreements on resource use, No. of groups applying sanctions in case of violation of regulations, No. and % of functional organisations, No. of groups initiating self-help activities independent of external assistance*
Gender issues	*% of female HH heads, % of women in decision-making meetings, % of women with access to land, % of women in land user groups, % of women with access to extension services, % of women with access to credit, average daily workload of men and women, female and male earnings*
Economic aspects	
Household income, micro-economy	*Net HH income, alternative income options, % of agricultural products sold on markets, gross / net margins of individual (men's, women's) production system components, internal rate of return, purchasing and spending power, No. of (truck) loads with products arriving at local markets, No. of merchants coming to markets, quantity of produce offered on markets, fluctuation of market prices, No. of people with bank accounts, No. of houses with corrugated iron roofs, No. of people with status symbols (e.g. radio, TV, bicycle, motorcycle, etc.)*

It is not possible to define "sustainable land management" globally. But it is possible to develop a vision of land management at the **local level** in terms of what is **more** or **less sustainable**, compared to previous years. This vision must be jointly developed with stakeholders, e.g. when planning a project. Since different actors have diverse perceptions of what they think is sustainable, it is not easy to select indicators of sustainability (e.g. environmental health). In contrast to this, indicators of unsustainability (poverty, overgrazing, symptoms of resource degradation, etc.) are usually easier to identify. But it must be kept in mind that the absence of indicators of unsustainability alone does not mean that land management is sustainable. It is therefore important to use both types of indicators.

- **Indicators of environmental health** describe a **vision** of greater sustainability of land management. They help formulate goals and indicate the directions to take.
- **Indicators of unsustainable land management** suggest that something is going wrong and serve as an **early warning system**. They show the need to confront problem issues and spend time to find the reasons as well as potential solutions.

Indicators represent a complex reality. For example, crop yield may be taken as an indicator of soil fertility. However, yield is influenced by many other factors, such as pests and diseases, rainfall variability, etc. Therefore, single indicators cannot represent a project context sufficiently. Only a **set of indicators** will provide plausible information on whether land management is moving towards or away from sustainability.

Example

Checklist 4b: Land use and farm management aspects of SLM

Land use types	*Environmental health indicators*	*Indicators of unsustainability*
Woodland	*Afforestation, high variety of non-timber forest products*	*Rate of deforestation, illegal cutting*
Cropland	*Appropriate tillage practices, good crop stand, crop rotation, integrated pest management, integrated soil and water conservation*	*Monoculture, inappropriate crop rotation, soil-borne parasitic weeds and nematodes, termites and leaf-eating ants, aggressive weed* (Imperata, Cyperus)*, decreasing length of fallow period, absence of conservation activities, abandonment of cropland, cultivation of marginal land (steep land with shallow soils)*
Pasture land	*Dense plant cover, high variety of species*	*Overgrazing, rangeland degradation, bare soil, trampled area, poor plant cover, change in species composition, increase of unpalatable species*
Farm management	*Good efficiency of farm resource management, high gross margins, increasing degree of organisation (farmers' organisations), high return on labour, good input use efficiency, application of conservation-effective practices*	*Rapid changes in farming system, low gross margins, absence of farmers' organisations, low return on labour, low input use efficiency, no application of conservation-effective practices*

Example

Checklist 4c: Ecological aspects of SLM (natural resources)

Resources	Indicators	Environmental health scenarios	Scenarios of unsustainability
Soils	Soil fertility, nutrient status (organic matter, acidity), toxicity	Dark, deep topsoil (humus), good drainage, high soil biological activity, earthworm casts, high earthworm density, high crop yield, high root density	Light, pale soil colour, indicator plants, yellow & red colour of plant leaves, small plants, poor soil drainage, no earthworms, low yield, low root density, limited rooting depth
	Creeping soil erosion: reduced topsoil depth (reduced water and nutrient retention capacity)	No indications of unsustainability	On-site: smoothened soil surface, accumulations, light soil colour, exposed plant roots, increased seeding rate. Off-site: brown rivers, sedimentation of water reservoirs
	Severe soil erosion, loss of entire topsoil		Erosion rills, gullies and large concentrated accumulations
	Wind erosion		Dust storms, mobile dunes, accumulations behind wind breaks
	Salinity & alkalinity		Salt, colour of plant leaves, level of salinity in water
	Compaction		Crust formation, increased runoff, less infiltration, difficult to plough
Water	Water availability	Sufficient water	Water shortage: depletion of groundwater table, drying wells, dying trees, increase of unpalatable species, excess water, increasing runoff, flash floods
	Water quality	Good water quality, good hygiene, clear colour, no odour	Algae, bad odour, brown colour, minimal variety of fish in rivers, human diseases
Vegetation	Biodiversity	Great variety of species	Minimal variety of species, high % of unpalatable species (pasture land)
	Biomass and nutritive value	Crop residues and dung remain on the field as fertilisers	Low crop yield and biomass, high yield variability, use of crop residues and dung as fuel
	Plant growth	Uniform plant growth, tall & dense stands, green, good crop	Low plant height & cover, pests and diseases, light green or yellow / purple colour of plant leaves, stunted corn, non-homogeneous ground cover
Animals	Quantity	Reasonable herd size, sufficient draught power	Overstocking: low grass cover on pasture land, encroachment on cropland
	Quality	Good livestock appearance, good productivity	Malnutrition & diseases, high mortality, low productivity, fodder shortage

Bookshelf

Bellows, B. **1996**. Indicators of sustainability. Workbook for the SUNREM CRSP. Washington State University / University of Wisconsin, USA.

Douglas, M. **1997**[2]. Guidelines for the monitoring and evaluation of better land husbandry. The Association for Better Land Husbandry: 28 p.

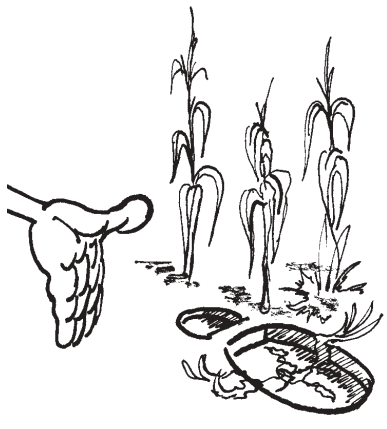
Dumanski, J., Gameda, S., Pieri, C. **1997**. Indicators of land quality and sustainable land management. Annotated bibliography. The World Bank, Agriculture and Agri-Food Canada: 157 p.

Kirsch-Jung, K.P., Görgen, M., Nill, D. (eds.) **2000**. Mesurer les effets des projets. Suivi d'impact et calcul de rentabilité économique. Contributions de trois ateliers sur la Gestion des Ressources Naturelles. GTZ, OE 45: 266 p.

Maître, A., Kuan, E. **1997**. La experiencia de PASOLAC con la metodología de la evaluación participativa por beneficiarios en la medición de la adopción de prácticas de conservación de suelos y agua. PASOLAC, PRM, PROFRIJOL. Memoria de taller de estudios de adopción. Managua.

Pieri, C., Dumanski, J., Hamblin, A., Young, A. **1996**. Land quality indicators. World Bank discussion paper No. 315. Washington D.C.

Romig, D.E., Garlynd, M.J., Harris, R.F. **1996**. Farmer-based assessment of soil quality: a soil health scorecard. In: Doran, J.W., Jones, A.J. (eds.) Methods for assessing soil quality. Soil Sc. Soc. Am. Spec. Publ. 49: pp. 39–60.



Step 5: Development and Application of Impact Monitoring Methods

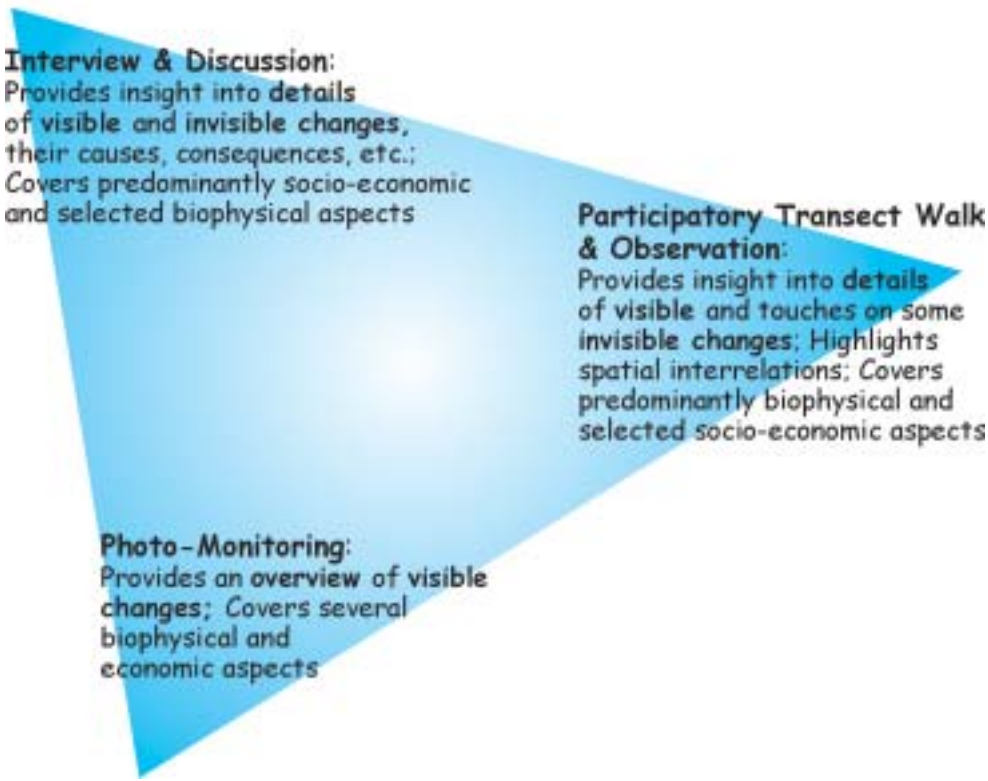


Figure 14: Triangulation

Interview and Discussion

Objective and Brief Description of the Method

Interview and discussion as participatory tools cover quite a wide range of indicators. They usually produce qualitative results and also serve as a cross-check on quantitative results, for example from structured interviews or biophysical measurements. The tools are used best in combination with complementary approaches and methods (triangulation) to ensure a quality of information appropriate for decision-making. They involve a shift of orientation in development cooperation, giving much more emphasis to indigenous knowledge systems. This is a shift from:

- dominance by Northern countries to facilitation, promoting assumption of responsibilities by local stakeholders (actors) for designing, monitoring and assessing their own development projects
- ready-made solutions to strategic diversity
- individual perception to group interests
- measurement to comparison
- data analysis to social interaction
- one-way data abstraction to mutual communication and learning

Procedure / Steps

(1) Local stakeholders have to be informed about the intentions of outsiders; procedures and the objectives of IMA activities have to be explained (even if the objectives are to be determined by local stakeholders). Participatory methods are two-sided processes: there is a need to get information from / about local people (for their own benefit!) who also want to know about outsiders. This forms the basis for a process of "mutual learning". It is not only results that count; reflection on processes is also important. 'Participatory' means involvement of all relevant social groups. Make a special effort to ensure that underprivileged groups are not neglected.

(2) Identify key persons who can provide advice, assist in applying some methods, and give valuable background information. This might also stimulate continuation of IMA by local stakeholders after projects have been phased out.

(3) Start by getting an overview of local circumstances first (e.g. participatory transect walk) before concentrating on specific issues. Don't start applying methods without a concept or an analytical framework into which the information can fit.

(4) Projects are more likely to be on the right track and results are more likely to be reliable if an appropriate mix of tools is applied in an analytical framework. Cross-checking is inevitable: as participatory methods are rather subjective, results have to be verified by different approaches (triangulation). Avoid standardised procedures, use the best possible judgement at all times. Only the specific situation can give hints about follow-up; stakeholders should decide how to go ahead.

(5) Repeat methods with different groups if they seem suitable.

(6) Discuss and determine where information will be stored and how to ensure access to it.

Potentials of the method	Limitations of the method
• can be used in all project phases • comparatively cost-effective, rapid, qualitative appraisals • integrates local / indigenous and external knowledge • allows in-depth investigation • hidden aspects can be discovered that are not obvious at first glance	• statistical evaluation is not necessarily ensured; need for verification by other methods • depends a lot on the behaviour, attitudes, values and beliefs of the surveyor; therefore, quality control is necessary to avoid abuse and to maintain certain professional ethics • methods have to be accepted and must be applicable by local stakeholders • exaggerated, standardised and routine use of participatory methods will "saturate" people • even if the tools / methods are allegedly participatory, there must be reflection about what ends are really served by the results: solution of locally perceived problems or project staff reports

Investments and prerequisites	
Essential equipment	• memo-block, cards, pens • materials found at the site (stones, seeds, etc. for visualisation)
Desirable equipment	• measuring instruments • tapes, cameras
Labour requirements	• survey team composition depends on the situation • well-trained, experienced and sensitised staff • several observers / interviewers would give a more objective picture • assistants are useful for some methods (e.g. semi-structured interviewing: someone who takes notes) • local stakeholders on the team facilitate access to and acceptance by a local community • it is essential that both women and men be on the team
Time expenditure	• little preparation time for the development of an analytical framework, but relatively time-intensive repeated visits and interviews. Local time schedules must be respected.

Albrecht, H., Bergmann, H., Diederich, G., Großer, E, Hoffmann, V., Keller, P., Payr, G., Sülzer, R. **1989**. Agricultural Extension, Volume 1, Basic Concepts and Methods. In: Rural Development Series, TZ-Verlagsgesellschaft; Rossdorf.

Bollinger, E., Reinhard, P., Zellweger, T. **1992**. Agricultural Extension. Guidelines for extension workers in rural areas. Beratungszentrale Lindau (LBL), Direktion für Entwicklungszusammenarbeit und Humanitäre Hilfe (DEH); Bern.

Chambers, R., Pacey, A., Thrupp, L.A. (eds.) **1989**. Farmers First. Intermediate Technology Publication; London.

FAO **1990**. The Community's Toolbox. The Ideas, Methods and Tools for Participatory Assessment, Monitoring and Evaluation in Community Forestry. Community Forestry Field Manual 2. FAO Regional Wood Energy Development Programme in Asia, Bangkok. FAO; Rome.

Pretty, J.N., Guijt, I., Thompson, J., Scoones, I. **1995**. Participatory Learning & Action. A Trainer's Guide. IIED Participatory Methodology Series; London.

Schönhuth, M., Kievelitz, U. **1994**. Participatory Learning Approaches – Rapid Rural Appraisal; Participatory Appraisal; An Introductory Guide. Ed. GTZ. Schriftenreihe No. 248.

Van Veldhuizen, L., Waters-Bayer, A., De Zeeuw, H. **1997**. Developing Technology with Farmers. A Trainer's Guide for Participatory Learning. Zed Books; London.

Werner, J. **1993**. Participatory development of agricultural innovations. Procedures and methods of on-farm research. GTZ/SDC, Schriftenreihe der GTZ, No. 234: 251 p.; Eschborn.

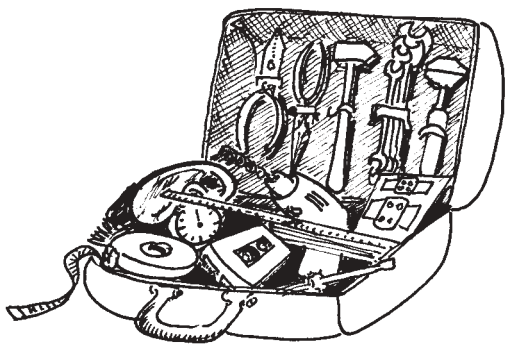


Photo-Monitoring

Objective and Brief Description of the Method

Development projects are implemented to improve selected components of a context, for example to achieve better living conditions, improve training and education for rural people, to achieve better production and resource protection, etc. Many of these changes are visible, and photo-monitoring (PM) is a good method for recording these **visual changes**.

Procedure / Steps

(1) Preparatory work

- Clarify the **reasons** for PM: In the present case, the purpose of PM is to monitor changes in order to assess the impact of a project. Photos encompass visible changes in the context, not only the direct and indirect impacts of the project activities in question, but also the influence of other factors (other projects, national policies, etc.). Photos alone do not constitute proof, but they can trigger a fruitful discussion among project stakeholders about changes.
- Clarify the **objects** of PM: The objects of PM correspond with **visible** impact indicators (cf. Step 4). Rural development projects should contribute, for example, to higher household income and living standards, which can be seen in terms of better housing and clothing, more children going to school, better means of private and public transport, etc. Similarly, if land use has changed and land management has improved, this should be visible in the form of improved crop stands, controlled soil degradation, conservation measures, etc.

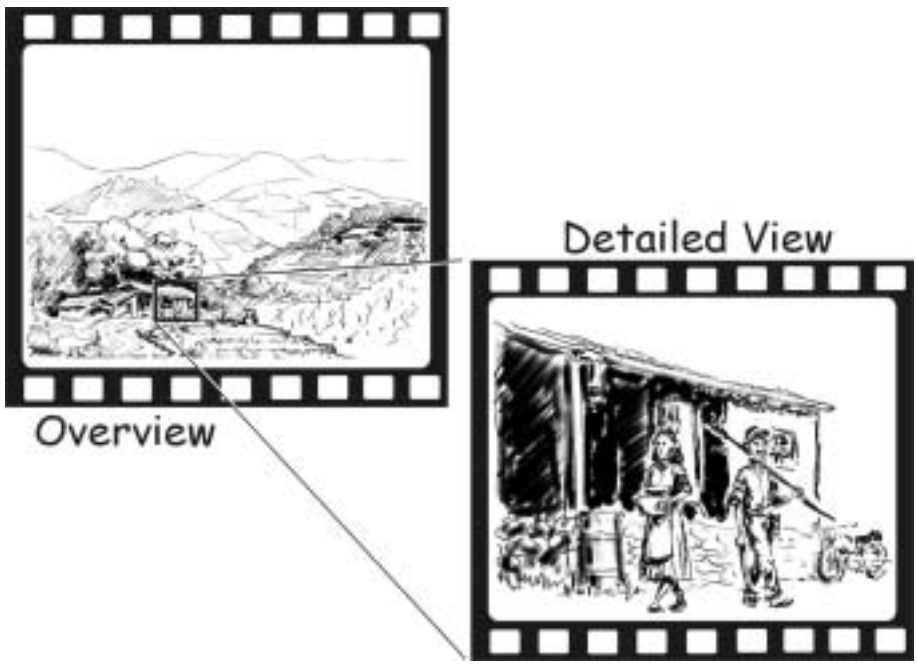


Figure 15: Photo-monitoring – overview and detail

- Determine the **locations** of PM: The examples of "better housing and clothing" and "better land management" constitute quite different photographic objects which require different types and scales of photography (Figure 15):
  - **Overviews**, showing a large part of the project area, e.g. the land use of a valley, an entire slope, a village, etc.
  - **Detailed views**, showing important particulars in the area, such as people, houses, rooms, agricultural technologies, constructions, means of transport, etc.

  This scenario refers to locations and indicators where visible changes can be expected (systematic monitoring). Additional photos should be taken whenever and wherever remarkable changes occur (occasional monitoring).
- Determine the **timing** of PM for each location: The timing depends on the indicators of change seen in the photos. For example: Quality of housing can be documented at any time. People can be documented every year, but always during the same activities or weekdays. Agricultural production can be documented shortly before or during harvest. Soil degradation can be documented shortly after the onset of the rains when vegetation cover is low.
- Determine the **responsibilities** for PM and its documentation.
- Plan discussion and **interpretation** of the photographs with stakeholders.
- It becomes clear that only those locations where changes are expected can be determined in advance (systematic monitoring). Any occurrence of new indicators or unexpected events and changes (occasional monitoring) requires an **adaptation** of the locations and the timing.

(2) Field work

Slides are the preferred film material, because they are more appropriate for oral presentations during stakeholder meetings. Prints of any size can also be produced from slides. Field work begins by finding the best standpoint (photo-viewpoint) to take pictures in accordance with the impact indicators (chosen in Step 4). In order to be able to take subsequent photos from the same spots in the future, the standpoints must be identified clearly. The best way to do this is to choose standpoints near a noticeable landmark or benchmark, such as a tree, the edge of a building, etc. Alternatively, standpoints can also be permanently marked in the field by (iron) poles, piles of stones, and the like. However, these "landmarks" might be removed. A third option is finding the standpoint with a global positioning system (GPS) or compass bearings, which requires additional equipment, training and experience. In any case, the definite standpoints and the directions of view of all photos are indicated on a map (Figure 16). A good sketch is a minimum requirement if there is no map available. Additional details such as the date and time of day, film and photo No., name of the location, focal length, etc. are documented on the field form (see below).

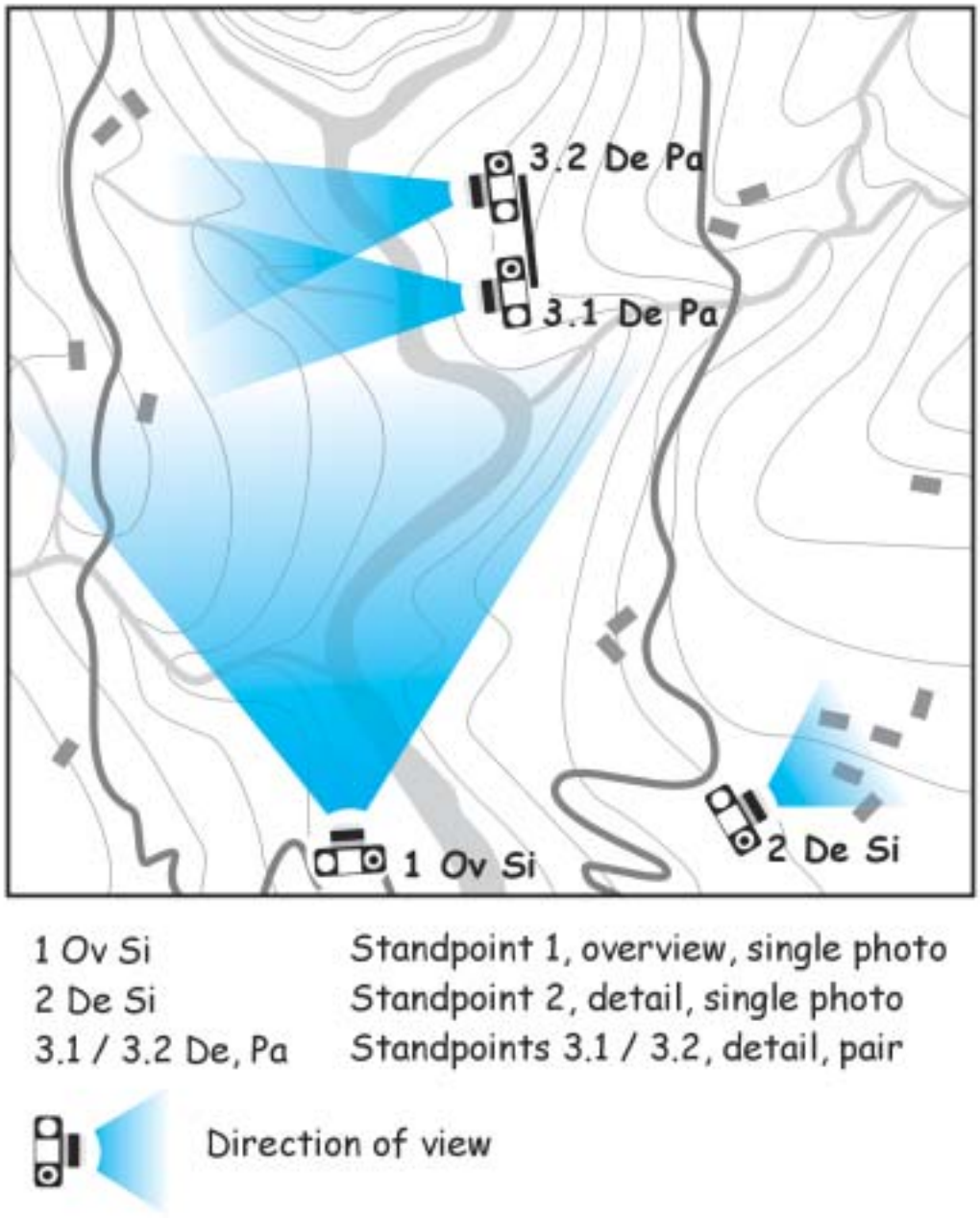


Figure 16: Photo-monitoring – map of standpoints

While detailed views (a house, a room, a person, a conservation measure, etc.) may require only one photo at a time, overview photos may comprise a sequence of adjacent pictures (Figure 17) made one after another by choosing a slightly different angle for each photo.

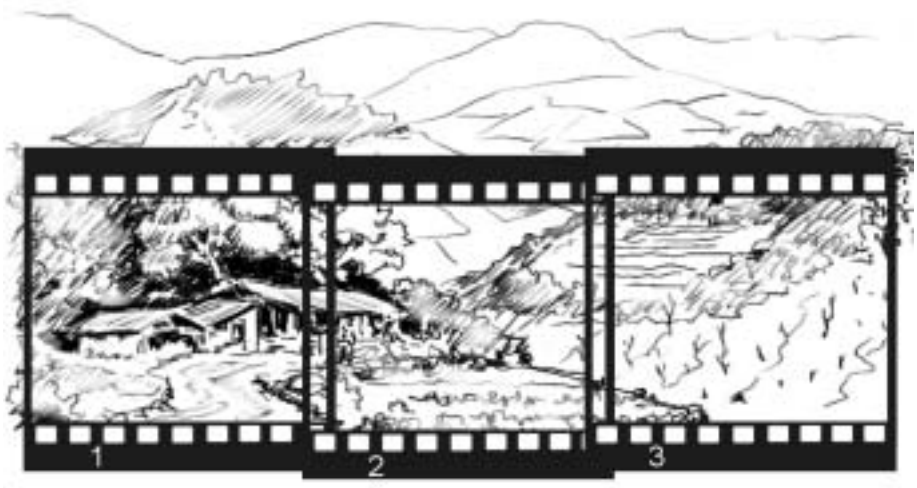


Figure 17: Photo-monitoring – photo sequence

In case a three-dimensional view and partially quantitative interpretation is desired, pairs of photographs of the same object are taken (Figure 18). Both photos are made from two adjacent standpoints, i.e. from the endpoints of an approximately 30-m-long "baseline". This line is preferably located on the slope opposite the object. The same object is thus taken from two slightly different angles, which allows a 3-dimensional view with the help of a stereoscope. The baseline, and its endpoints (standpoints) and the direction of view, are also indicated on the map (Figure 16), and further details are documented on the field form.

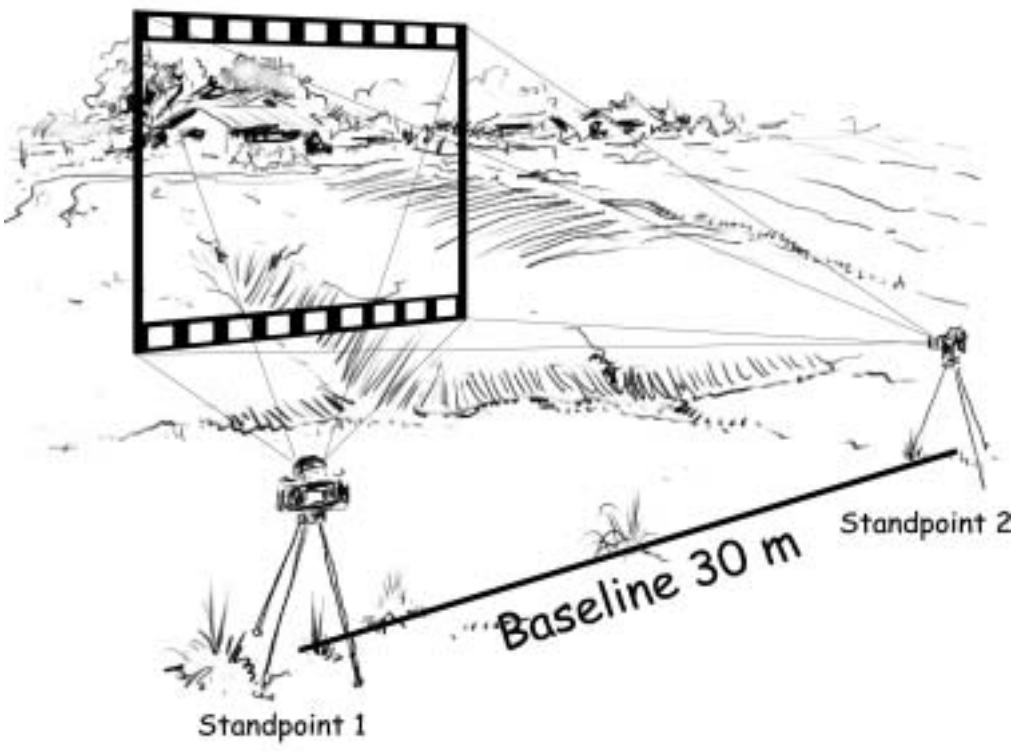


Figure 18: Photo-monitoring – taking a pair of photos (stereo photos)

Field Form: Photo-Monitoring

Name of area / village: **Photographer:**

Film No.	Photo No.	Type of photo*	Date	Time of day	Focal length (mm)	Stand-point No.	Direc-tion of view**	Description of subject, other information
	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	10							
	11							
	12							

* Type of photo: **Ov** = Overview; **De** = Detailed view; **Si** = Single photo; **Se** = Photo sequence; **Pa** = Pair of photos
** Direction of view: North, Northeast, East, etc. or any other description (towards main road, etc.)

(3) Documentation

Slides and photographs should be kept in files together with maps, field forms and other notes and materials. Reactions and interpretations when the pictures are discussed with the stakeholders are part of the impact assessment (cf. Step 6), which can be done together with the presentation of results obtained through other monitoring methods. The entire outcome of such discussions will be stored together with other IMA data and information.

Potentials of the method	Limitations of the method
• comprehensive and fast method • professional manpower or sophisticated equipment would improve the quality but are not necessary (reflex camera desirable, but pocket camera can also be used)	• restricted to visual changes; should be used together with other monitoring methods

Investments and prerequisites	
Essential equipment	• camera • field forms • 100–200 ASA film
Desirable equipment	• reflex camera (35-mm camera, changeable lenses, filters, tripod and cable release) (Costs of sophisticated equipment are estimated at US$ 1,200–2,200) • filing cabinet for slides and photos • light box for examination of negatives or slides • large-scale topographic maps or altimeter and compass • (pocket) stereoscope is needed only for pairs of photos (stereo photos)
Labour requirements	• people with basic experience in photography
Time expenditure	• time input depends on the number of sites and distance to sites

Bosshart, U. **1997**. Photo-Monitoring. Centre for Development and Environment, University of Bern: 44 p.; Bern.

Swiss Agency for Development and Cooperation **1992**. Photography in project work. Uses and limits in photo-observation: 50 p.; Bern.

Participatory Transect Walk and Observation

Objective and Brief Description of the Method

A participatory transect walk is conducted by a team to observe and talk about issues of local importance. The area under study is systematically traversed by experts (outsiders) and local informants (insiders). The team is preferably composed of people representing different disciplines – biophysical and socio-economic – in order to cover a wide range of topics during the walk. The walk follows a specific route, e.g. from the highest to the lowest point, from north to south, etc. Everything mentioned by the informants and everything observed and questioned by the outsiders is discussed and noticed. The walk supplements "official" information (reports, secondary literature, etc.) with subjective and lateral observations and experiences. This method can be used for a qualitative approach as well as for a rapid semi-quantitative assessment.

The participatory transect walk is a particularly good chance to get an overview of visible resource degradation as a sign of unsustainable land management: Which degradation processes prevail, when do they occur, and where are areas of particular hazards (hot spots)? Such visible signs are a starting point for further informal discussions with local and other stakeholders on the spot, and consequently for understanding different perceptions of the same issue. Socio-economic topics are already subject to interviews and discussions, but may also be taken up during the walk.

Procedure / Steps

(1) Local key informants are asked to form an observation team together with outsiders.

(2) A route is identified by the group.

(3) If possible, the team develops its own norms for group behaviour (team contracts).

(4) The transect walk is planned (definition of the subjects, methods used). To identify signs of unsustainable land management, for example, the attached field form (see below) will give initial hints about what to look at. Discussions prior to and during the walk may give further clues about observable symptoms and indicators.

(5) The timing of the walk depends on the subject. For example, soil erosion can best be observed at the beginning of a rainy season, crop pests and diseases during the cropping period, crop yield before harvesting, water problems during dry and rainy seasons, etc.

(6) During the transect walk, new findings are considered and pursued if they seem to be important to the overall subject.

(7) Different land units (slope, level terrain, forest, cropland, natural sites, village, etc.) and problem areas (erosion hazards, water problems, malaria, etc.) are distinguished. During the walk, relevant observations are marked on the map and accompanied by extended remarks and descriptions in a field book. Sketches of the area enhance detailed observation more than photos. Like photographs, sketching can be used to visualise impressions or changes after a certain period of time.

(8) Symptoms of unsustainable land management, for example, will be observed within their topographic sequence, with a continual search for possible interrelations or causes of degradation up- and downslope, or up- and downstream.

(9) Information is shown on a general transect map. Sketches, photos and notes can be used to reflect on the mapping and for discussions with others who did not see the location. Sketches can be used on the same day, while photos may take longer to be developed. In view of the long-term nature of IMA, field maps may need to be redrawn on clean paper while the field impressions are still vivid, preferably on the evening of the field day.

Potentials of the method	Limitations of the method
• provides a good overview and a rather intensive impression of a new location • closely considers the local knowledge base • all local land users can participate • important new issues arise which may have been overlooked • provides basically qualitative results, but some indicators can be quantified • signs of unsustainable land management can be mapped within a topographic sequence, which reveals spatial interrelations of bio-physical and socio-economic processes	• subjective information; mapping reveals only what is visible to the person who applies the method • quantitative statements, in particular, must be supported by additional investigations

Investments and prerequisites	
Essential equipment	• field book, pens • clip board • topographic maps, sketch maps • compass, altimeter
Desirable equipment	• large sheets of paper • camera, binoculars • metre, measuring tape • spade, soil auger • field pH meter
Labour requirements	• depending on the subject: 1–3 persons, with background in both social and natural sciences
Time expenditure	• one person or team needs approximately one day for detailed mapping of 3–4 km^2

Bookshelf

Germann, D., Gohl, E., Schwarz, B. **1996**. Participatory impact monitoring. Booklets 1–4. Gate/GTZ.

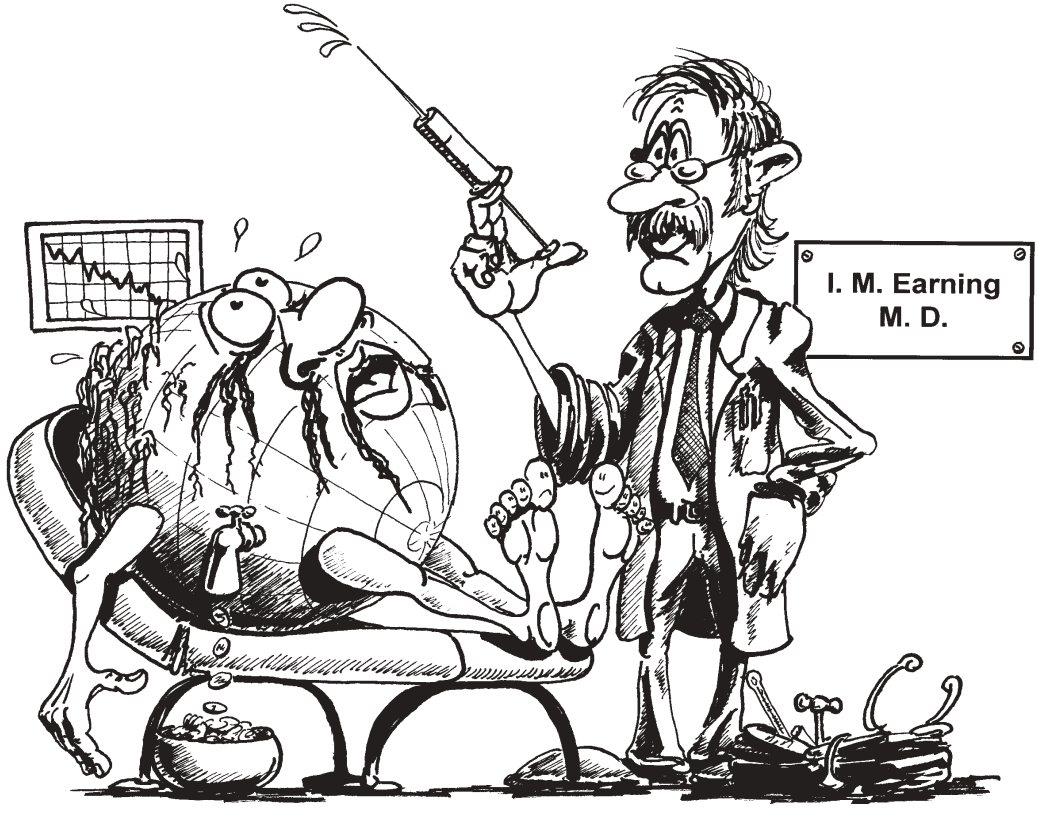
Pretty, J.N. **1990**. Rapid catchment analysis for extension agents. Notes on the 1990 Kericho workshop for the Ministry of Agriculture, Kenya. IIED; London.

Field Form: Participatory Transect Walk and Observation

Checklist: Signs of unsustainable land management

Signs of unsustainable land management	Indicators (what to observe)	x
Soil fertility decline	changing colour of plant leaves	
	reduced plant cover / production	
	salt on soil surface	
	abandonment of cropland	
	soil colour changes	
	decreasing root density	
	poor soil drainage	
	compaction: crust thickness, strength (break by hand)	
	indicator plants	
	…	
Degradation of plant resources (possibly as a consequence of soil / water degradation)	changing colour of plant leaves (yellow)	
	pests and diseases	
	low plant ground cover (estimation in %)	
	low variety of plants / high variety of weeds (species composition)	
	…	
Soil erosion by water	exposed plant roots (cm)	
	rills, gullies and accumulations (No., density, volume)	
	reduced topsoil depth (spade or drill)	
	change in soil colour indicates subsoil exposure	
	increasing runoff, periodic flash floods (time)	
	sedimentation of reservoirs, deposition visible during low water table	
	water turns brown	
	increased seeding rate	
	increasing stone cover (topsoil already washed away)	
	…	
Wind erosion	dust storms, mobile dunes (pegs as reference points)	
	nutrient depletion (incl. acidity), toxicity (pH)	
	…	
Declining water quality and quantity	water has brown colour (soil erosion)	
	algae	
	bad odour	
	months of water shortage	
	diminishing groundwater table	
	drying up of wells, springs and rivers	
	dying trees	
	more unpalatable weeds – fewer fodder species	
	…	
Degradation of animal resources (possibly as a consequence of plant degradation)	changing No. of livestock per household or village	
	malnutrition / shortage of fodder	
	animal diseases	
	…	
Land use changes	increasing % of cropland	
	deforestation	
	shortening fallow period	
	pasture turned into cropland	
	…	

... list of indicators should be supplemented

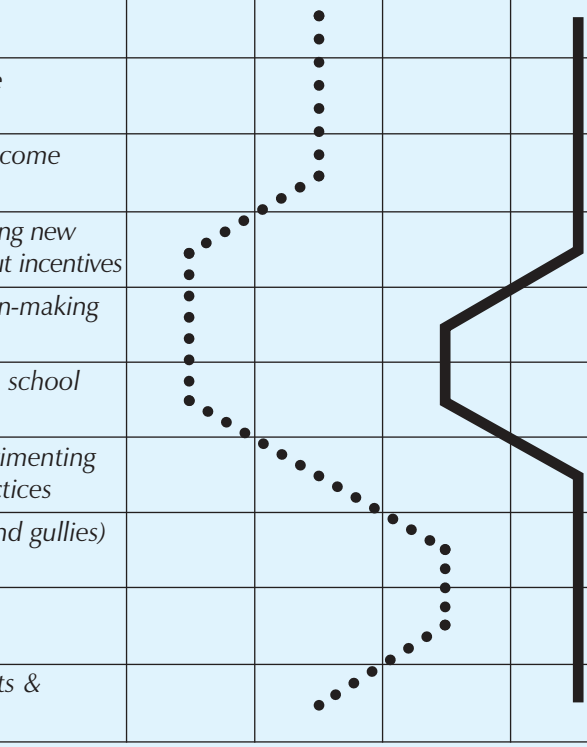

I. M. Earning
M. D.

Step 6: Impact Assessment

Example

As an alternative to the spider diagram, changes in the context can also be visualised as an impact profile.

	Impact indicators	Rating				
		1 Very bad	2 Bad	3 Moderate	4 Good	5 Very good
economic	Crop yield (maize)					
	Household income					
	Women's labour income					
social / institutional	% of farmers adapting new technologies without incentives					
	Household decision-making					
	Boys and girls with school leaving certificate					
	% of farmers experimenting with cropping practices					
ecological	Soil erosion (rills and gullies)					
	Soil fertility status					
	Occurrence of pests & diseases					



Initial scoring: ••••••••••

Scoring after 10 years: ——————

Bookshelf

Douglas, M. **1997**[2]. Guidelines for the monitoring and evaluation of better land husbandry. The Association for Better Land Husbandry: 28 p.

Gohl, E. **2000**. Prüfen und lernen. Praxisorientierte Handreichung zur Wirkungsbeobachtung und Evaluation. Association of German Development NGOs: 104 p.

Herweg, K., Slaats, J., Steiner, K. **1998**. Sustainable land management – guidelines for impact monitoring. Working documents for public discussion. Workbook 79 p. and Toolkit 128 p.; Bern.

IUCN. **1997**. An approach to assessing progress towards sustainability – Tools and training series. IUCN / IDRC; Gland.

McMay, V., Treffgarne, C. (eds.) (**no date**). Evaluating Impact. DFID, Education research, Serial No. 35.

Mutter, T. **2000**. Evaluieren NGOs anders? Die Folgen von Partnerautonomie und Organisationsgrösse. Entwicklung und Zusammenarbeit, No. 12: pp. 351–353.

Neubert, S. **1999**. SWAP – ein neues System zur Wirkungsanalyse armutsorientierter Projekte in der Entwicklungszusammenarbeit. Entwicklung und ländlicher Raum, 1/99: 25–28.

PASOLAC / INTERCOOPERATION **1999**. Evaluación participativa por productores. Programa para la agricultura sostenible en laderas de América Central; Doc. No. 216: 58 p.; Managua.

PASOLAC / INTERCOOPERATION **1999**. Evaluación participativa por productores. Programa para la agricultura sostenible en laderas de América Central; Doc. No. 200: 33 p.; San Salvador.

PROASEL / INTERCOOPERATION **1999**. Evaluación participativa por productores. Programa Suizo con organizaciones privadas para la agricultura sostenible en laderas de América Central; Doc. No. 57: 30 p.; Tegucigalpa.