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Locally derived indicators for evaluating sustainability of farming systems

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Introduction

The basic motivation for developing methods to assess sustainability is the fact that many land-use systems degrade the natural resources and cannot be sustained over a longer period. This paper reports about a study on the island of Leyte, Philippines. A great part of the land is officially not classified as arable land, but since many small-scale farmers are lacking alternatives to sustain their livelihood, and due to population pressure, many of these areas are actually used for agriculture (GÖLTENBOTH and HUTTER 2004). Therefore there is a need to compare different farming systems and evaluate which ones might be sustainable. But in order to be of consequence, local objectives and understanding of the term sustainability have to be analysed, since even the most sustainable land-use system is of no use if nobody is using it.

Extensive research has been undertaken with regard to identification of suitable indicators for evaluating sustainability of agriculture, but only few studies have involved local objectives (REED *et al.* 2005). Several expert-led frameworks have been developed, such as the Framework for evaluation of sustainable land management (FESLM), introduced by SMYTH and DUMANSKI (1993) or the framework by OECD (2001). While both frameworks explicitly include social aspects, they still focus strongly on measurable agro-environmental and economical indicators.

For this study project the Sustainable Rural Livelihoods (SRL) Framework has been used to organise the search for indicators (Figure 1). It approaches the analysis of links between livelihoods and natural resource use and has been widely discussed in recent years (SCOONES 1998). It has, i.e., been applied by WOODHOUSE *et al.* (2000) in the specific context of sustainability indicator selection. It assumes that rural people depend on five different "capital assets" (natural, human, physical, social and financial capital) to sustain their livelihoods.

According to this concept, rural livelihoods are regarded as sustainable when they can "cope with and recover from stresses and shocks and maintain or enhance [their] capabilities and assets both now and in the future, while not undermining the natural resource base" (CARNEY 1998:4). The SRL framework focuses on all dimensions that comprise a livelihood.

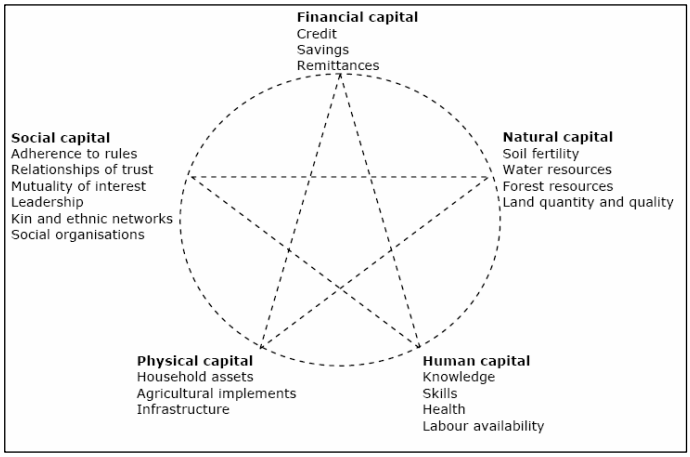

Figure 1. The five capital assets of the Sustainable Rural Livelihoods Framework (CAMPBELL *et al.* 2001)

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Material and Methods

The island of Leyte belongs to the Eastern Visayas, a group of islands in the central Philippines. The main source of income for the majority of the population on the island comes from the production of crops (main cash crops/products are copra and abaca), livestock and marine products. The western part of Leyte has no pronounced rainy season but a drier season for about two months between March and May.

The results presented here are from the first phase of an ongoing study project. Eight focus group discussions (FGDs), distributed over five municipalities and six barangays (smallest administrative district) were carried out, all located on the west side of the island where Visayan is the dialect spoken (see Table 1 for details). Six groups consisted of farmers participating in a development project and two groups of farmers not being involved in any project. Two translators were assisting, one being responsible for moderation of the discussion and one for taking notes.

Table 1. Overview over respondents in group discussions (from north to south)

Municipality, Barangay	Type of project	Duration of project	Responsible for project	Comments
Tabango, Omaganhan	Lumber trees/none	4 years/NA	ICRAF/NA	Quite infertile soil, no irrigation, a lot of livestock
Ormoc, Lake Danao	Sustainable vegetable production	1 year	Pagtinabangay found. (NGO)	700m asl, cooler climate, bad public transport, typhoon area
Albuera, Tabgas	Abaca and Rainforestation Farming[1]	2 years	LSU	Cooperative (Abaca and Rainforestation), remote location
Baybay Patag	Rainforestation Farming	11 years	LSU	Rainforestation in farmers association, very small farms
Mailhi	Agroforestry	12 years	LSU	Individual agroforestry
Hindang, Anahaw	Lumber trees/none	7 years/NA	ICRAF/NA	Rice and upland farming

NA = not applicable

1: A type of Agroforestry which has been developed by the GTZ and the Leyte State University and is based on the use of native trees only.

During FGDs farmers were asked, in an opening round, how they judge if a farming system is sustainable/successful. To facilitate ranking of criteria afterwards, answers were written down on cards. Thereafter more probing questions were asked related to the different capitals, i.e.: *How can farmers be successful despite natural misfortunes? How would you recognise a successful farm (a failing farm) from its appearance? What social advantages and/or responsibilities does a successful farmer have in the community?* The FGDs lasted around two hours and were usually carried out in the morning, followed by a common lunch. The groups were either organised by an extension worker from the University or a development organisation, depending on the project, or by the barangay captain. It was preferred that no development worker was present during the discussions to minimize bias, although this could not always be achieved.

The nine other stakeholders, consisting of governmental extension agents, representatives from development organisations, University staff and local authorities, were interviewed individually, following roughly the outline of the FGDs. Interviews were conducted in English.

For the groups ranking was done by the whole group (no individual ranking), while for the other stakeholders the ranking was individual. The "indicators" presented here are not already measurable indicators, but more criteria or raw indicators. But for simplification, the word indicator is used throughout this report.

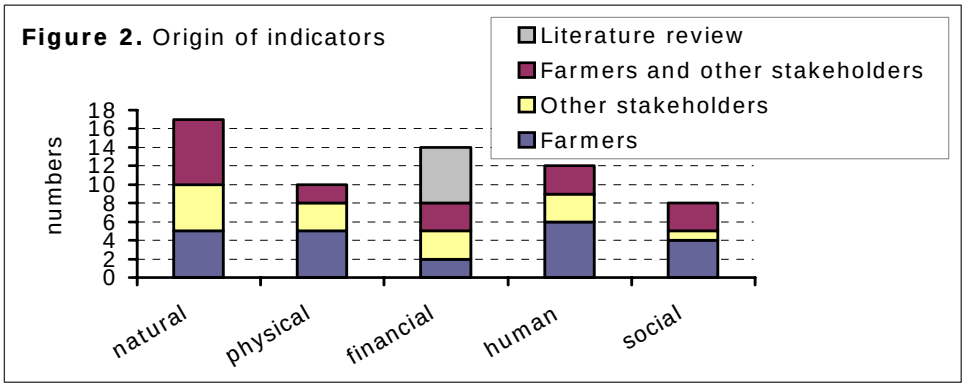
Results and Discussion

The SLR framework with its five types of capital was used to organise the indicators identified during the FGDs and interviews. The most important ones were then ranked. Overall, 51 indicators were identified from the FGDs, the interviews and from literature review (Figure 2).[1] Farm-

[1] For later analysis the list of indicators will be reduced, but this topic will not be discussed further here.

ers identified 46 and other stakeholders 34 indicators, while 6 exclusively financial indicators were identified by literature research. While there is quite substantial overlap, still several indicators were either solely named by farmers or other stakeholders. For farmers these were normally more personal indicators (i.e. farm size, closeness of fields to house, education of children), while other stakeholders considered broader concerns (i.e. biodiversity, cleaner air and water) and influences from outside (i.e. dependency on external inputs).

Figure 2. Origin of indicators



Comparing farmers groups ranking with other stakeholders, grouped according to type of capital, the high prevalence of farmers for natural capital indicators is obvious, while other stakeholders focus was strongly on financial indicators (Table 2). Although, looking at the sheer number of indicators out of each asset, natural capital reached first place for both groups and financial capital second.

Table 2. Importance of different types of capitals perceived by farmers groups and other stakeholders

	1st rank	2nd rank	3rd rank	4th rank	5th rank
Farmers groups	Natural	Social	Financial	Physical	Human
Score[1]	55	23	20	12	10
No. of times mentioned in FGDs or interviews	44	22	33	21	23
Other stakeholders	Financial	Natural	Human	Physical	Social
Score[1]	52	27	26	13	13
No. of times mentioned in FGDs or interviews	18	33	11	11	17

1: The first indicator out of the five ranked got 5 points, the second 4 and so on.

The indicator ranked highest in group discussions was security of tenure (Table 3). This was perceived to be of utmost importance by tenants and landowners alike and was often named by tenants as reason for not investing in soil conservation methods or tree based production systems. It is remarkable that under the seven highest ranked indicators, there is only one (soil quality) which was ranked by farmers and other stakeholders alike.

Table 3. Indicators ranked highest by farmers groups and other stakeholders

Farmers groups			**Other stakeholders**		
Capital	Indicators ranked high	Score[1]	Capital	Indicators named most often	Score[1]
S	Security of tenure	18	F	Income	27
F	Access to credit (for farm inputs)	16	H	Health	12
N	Climate/weather	10	S	Access to training	11
N	(sufficient)Farm size	9	H	Knowledge	9
N	Soil quality	8	F	(less) Dependency on external inputs	9
N	Use of soil conservation methods	8	F	Income diversification	7
N	Incidence of pests	7	N	Soil quality	7

N=natural capital, F=financial capital, S=social capital, P=physical capital, H=human capital
1: The first indicator out of the five ranked got 5 points, the second 4 and so on.

Regarding natural capital farmers often felt there is not much they can do, i.e. regarding the weather, but also regarding infertile soil and pests. Farmers being involved in a development project were less fatalistic and believed that there are ways to improve their farming systems and

adapt better to climatic conditions. Several times farmers mentioned the use of biological fertiliser, composting and organic production methods, but it sounded more like something they were told very often than something they believed themselves, since one of their main constraints was lack of finance to buy fertiliser and pesticides. Furthermore, results from a survey carried out after the FGDs confirm that many farmers use pesticides and mineral fertiliser while only few rely on biological protection (results of the survey are not presented here). Farmers never mentioned the practice of cash advance during FGDs when asked for constraints they face, unless being asked for directly. Most farmers get inputs or cash before the harvest from traders or farm-supply shop owners and are therefore forced to sell their harvest to before agreed conditions to the creditor. More comments regarding the different type of capitals are listed in Table 4.

Table 4. Issues raised by the respondents in relation to capitals

Form of capital	Local farmers' perceptions	Comments/contradictions
Natural	Organic agricultural practices should be applied (i.e. manure only, no pesticides)	Sounds like an answer they are expected to give, since they prefer to have access to fertilizer and pesticides
Financial	Farmers only mentioned the practice of cash advance as a problem when being directly asked for	Being stuck in debts seems a problem when trying to alter farming techniques or harvest new products, or influence time of sale
Human/ Social	Expect that training would help them (or their children) to farm more sustainably	It seemed often that they were more looking for support in money or in assets, than that they were interested to be told what they can do better
General	Decisions only depend on themselves	No mention of traders (abaca), although prices depend on them

Conclusions and Outlook

Farmers groups ranked different indicators high than other stakeholders. This might partly be caused by the methodology, since for the FGDs translators had to be used while the interviews could be conducted without the help of research assistants. And it is likely that the worldview of the other stakeholders included in this study is closer to the view of external "experts", coming mostly from a scientific background as well. In the next phase therefore, more stakeholders and farmers will be asked for individual ranking to increase the number of participants and verify the outcome achieved in this phase.

Acknowledgements

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References

CARNEY D (1998, ed.). Sustainable Rural Livelihoods. What contribution can we make? DFID, London.

GÖLTENBOTH and HUTTER (2004). New options for land rehabilitation and landscape ecology in Southeast Asia by "rainforestation farming". *Journal for Nature Conservation* 12:181-189.

OECD (2001). Environmental Indicators for Agriculture: Methods and Result, Exec. Summary, OECD press, Paris.

REED MS, EDG FRASER, S MORSE and AJ DOUGILL (2005). Integrating methods for developing sustainability indicators to facilitate learning and action. *Ecology and Society* 10(1):r3. Online in December 2005 under URL:http://www.ecologyandsociety.org/vol10/iss1/resp3/

SCOONES I (1998). Sustainable rural livelihoods: A framework for analysis. IDS Working Paper No. 72, Institute for Development Studies, Brighton, UK.

SMYTH AJ and J DUMANSKI (1993). FESLM: An International Framework for Evaluating Sustainable Land Management. Word Soil Resources Report no. 73, FAO, Rome.

WOODHOUSE P, D HOWLETT and D RIGBY (2000). A Framework for Research on Sustainability Indicators for Agriculture and Rural Livelihoods. Sustainability Indicators for Natural Resource Management & Policy Working Paper No. 2. Department for International Development, University of Bradford, UK. Online in August 2005 under URL: http://les.man.ac.uk/ses/research/CAFRE/indicators/wp2.pdf