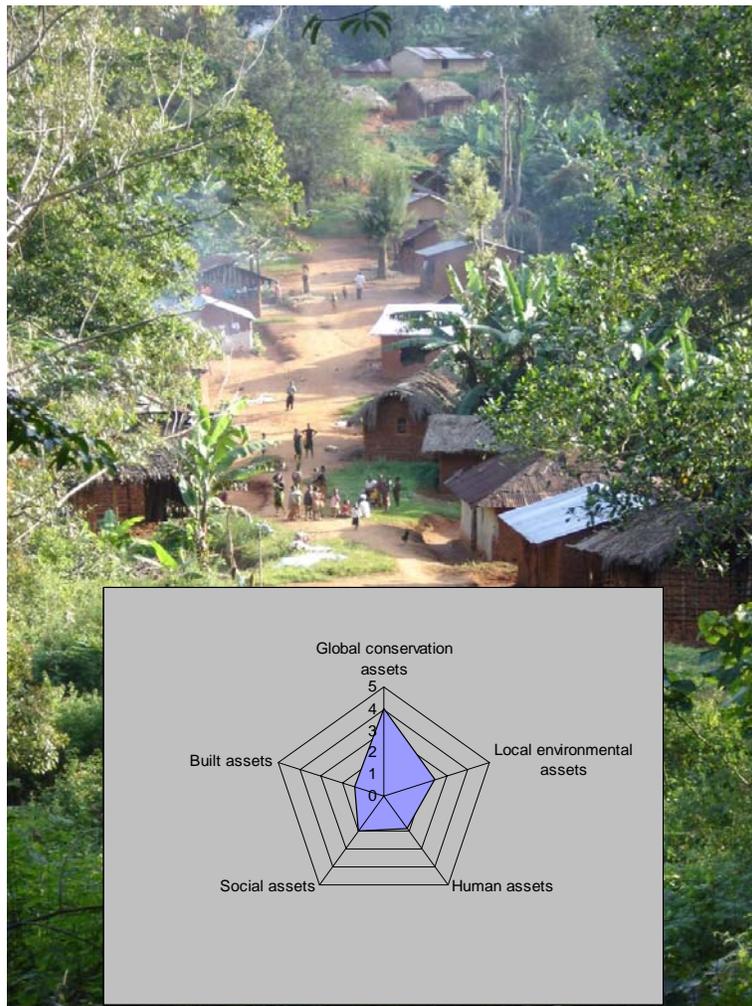




## In Practice

### *Landscape Outcomes Assessment Methodology*

### **“LOAM”**



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**WWF Forests for Life Programme**  
**May 2007**

## List of Contents

I	Introduction .....	3
II	How and Where is the LOAM being used? .....	4
III	How to go about implementing the LOAM process .....	6
IV	Dealing with trade-offs .....	10
V	Presentation of Results .....	12
VI	Analysis and Use of Results.....	13
VII	Key References.....	14
	Annex 1: The Assets Framework.....	15
	Annex 2. Examples of Indicator measurement descriptions .....	17
	Annex 3: More examples of first Indicator sets .....	21
	Annex 4: How to create Radar diagrams in Excel.....	23

### **Please Note: Your input and comments are very much appreciated**

The LOAM – Landscape Outcomes Assessment Methodology – is still very much a work “in progress”. The guidance and ideas expressed in this paper are based on experience gained to date in developing the approach, but we recognize that there is much more learning to be done from further practical implementation. Therefore we see this paper as very much a “Living Document” which will be updated and improved in due course.

Therefore given that this paper is still very much in a dynamic process of development, we are very open to and would greatly appreciate your feedback and comments on its clarity and how useful you find it, and any thoughts on how it might be further developed in future.

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## I Introduction

Conservation and development agencies, including WWF, IUCN and the World Bank, are increasingly focusing efforts on developing programmes at a landscape level (sometimes described as priority conservation area). One of the biggest challenges of working at the level of a landscape is identifying key values or functions of the landscape as a whole, as well as measuring and monitoring outcomes of development programmes in terms of biodiversity, livelihoods and environmental services.

In response to these challenges, the Forests for Life (FFL) Programme of WWF has developed the LOAM – Landscape Outcome Assessment Methodology. This aims to measure, monitor and communicate the nature and extent to which a landscape is changing over time with respect to a small number of agreed conservation and livelihood outcomes.

What is especially important about the LOAM is that it is not only a tool or framework, but also the process itself that can provide potentially significant results and outcomes by building common understanding and consensus between different stakeholders within and out-with the landscape.

LOAM uses the Capital Assets/Sustainable Rural Livelihoods Framework of Carney et al. (1988; further explained in Annex 1). This is based around 5 assets – natural, human, physical (or built), social, and financial (or economic). The process identifies through a stakeholder process, a small representative set of locally appropriate indicators grouped under each of the 5 assets. A scoring system is then applied to measure, monitor and communicate the nature and extent to which the landscape is changing over time.

Application of the LOAM approach is generating considerable interest around the WWF network and with stakeholders. There are already clear signs that the LOAM process can help us and other stakeholders to understand better how conservation projects can have an impact at a landscape scale. Indeed the very process of bringing the different stakeholders together to discuss and debate their views and aspirations for the future of their landscape, can quickly help to build a shared understanding of each other's values and needs from the landscape, as well as a common interest in developing ways of sustainably managing and regularly monitoring the condition of the key assets.

## II How and Where is the LOAM being used?

Experience to date is showing that the expectations and needs of what the LOAM can deliver are very different depending on the situation in each landscape. It is very important that these expectations are clarified at the outset so that the LOAM is applied for the purpose it is intended, rather than as a proxy for something else.

- It **IS** about working with others who have a stake in the landscape to help identify and agree a set of desired outcomes for the landscape (recognising that this can be a long-term process).
- The LOAM process **IS** about developing an understanding of landscape change and facilitating discussion and negotiation with, and between, the range of stakeholders about futures for the landscape.
- It **IS** about working with others to track the nature and extent to which conservation and other interventions are having an impact at a landscape scale. It may therefore provide a basis for deciding on adaptive management interventions.
- LOAM is **NOT** about monitoring and evaluation of individual projects and tracking the direct impacts of their interventions. There are other well defined techniques for doing this including the WWF Network Standards (reference list).

LOAM can also help us to understand better how our projects or programmes can have an impact at a landscape scale and guide project design and implementation accordingly. We talk about developing and delivering programmes at a landscape scale, but in reality it is usually not realistic to expect or try to solve all the conservation and development problems of a large landscape. What we can do however is work to ensure that our activities are implemented in ways that support improved outcomes both for conservation and for the well-being of the people who live in the landscape. This means that we have to understand what is important for the people in the landscape and we have to know how the landscape is changing and why. That way we can adapt our own activities so that, along with all the other things that influence the future of that landscape, they help it to develop in a positive way.

Figure 1 shows an interpretation of where the LOAM approach fits in a spectrum of scale from a site, through landscape up to the ecoregion or regional level. It also illustrates its recommended role as fitting between project level monitoring at the smaller end of the spectrum, and full-blown inter-sectoral scenario building at the regional or ecoregional level. However, the boundaries are not absolutely distinct and the approaches may overlap slightly with each other in some cases. The diagram shows some of the other key features of the LOAM.

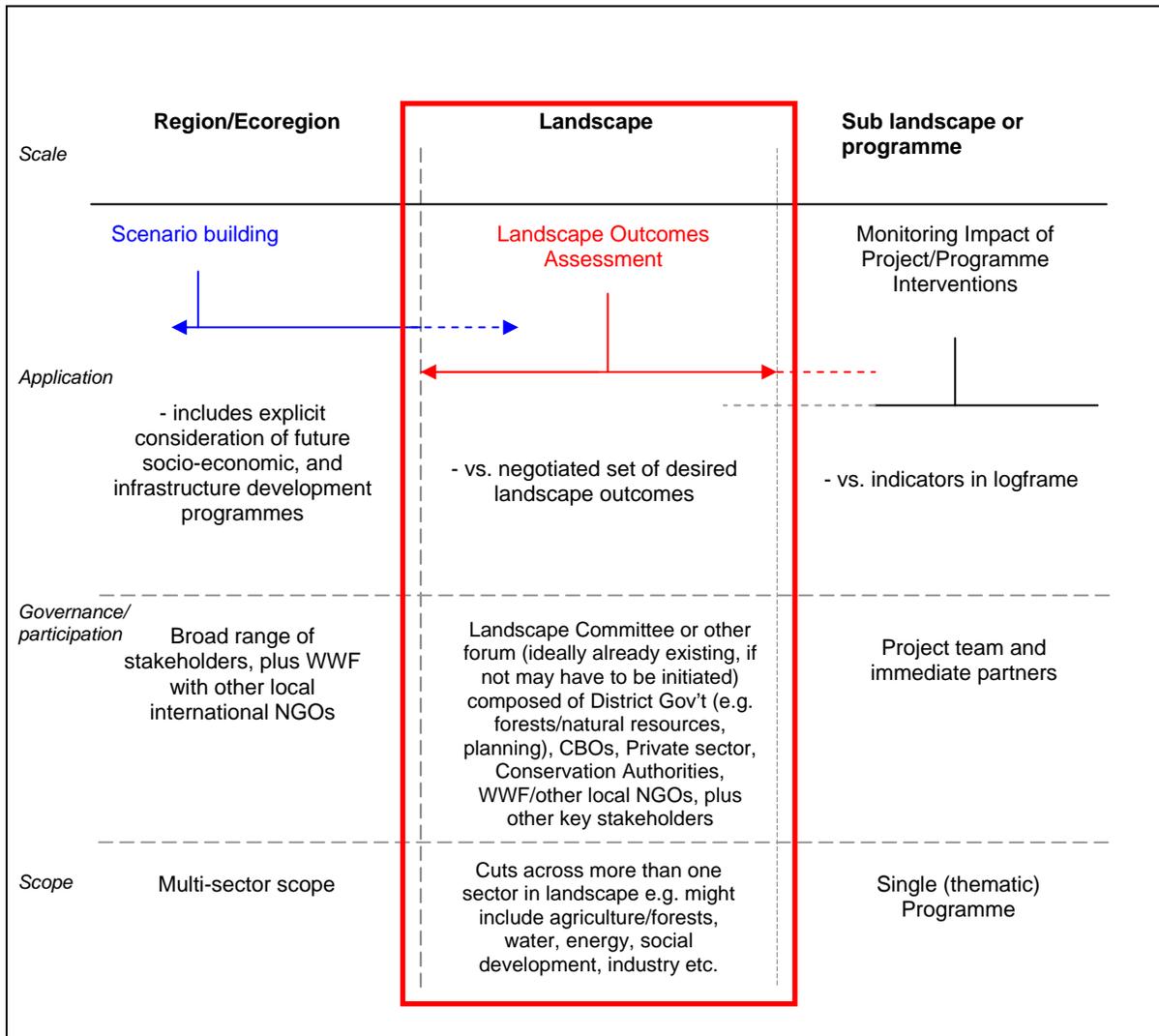


Figure 1. Relative positioning of LOAM with respect to scale and some key features

### Where is it being used?

The most developed use of the LOAM to date is in the Congo Basin where annual workshops focused around the Tri-National de la Sangha landscape, have taken place in Bayanga, CAR (2005) and Mambéle, Cameroon (2006), and with a third planned in the Republic of Congo for June 2007. In addition, workshops have taken place and follow-up work is ongoing in both Kwale District, Kenya, and East Usambaras, Tanzania. Workshops have also been held in Chaouen, Morocco and Mondulkiri, Cambodia, with subsequent visits to Lao and Vietnam. Future workshop locations being planned include the Fandriana-Marolambo landscape in Madagascar.

The LOAM approach is also of interest to private sector companies who own or manage plantations, most notably those committed to improving biodiversity conservation and socio-economic values of their plantations in the broader landscape. Workshops have taken place in Portugal, South Africa and Uruguay.

For further information and contacts on where LOAM is being used please contact Mark Aldrich, e-mail: [maldrich@wwfint.org](mailto:maldrich@wwfint.org)

LOAM is also generating interest with other partners – WWF is facilitating a number of workshops jointly with CIFOR – the Center for International Forestry Research – with funding from MacArthur Foundation, and other work is in progress with Ecoagriculture Partners and IUCN (with funding from PROFOR). For more information please contact Jeff Sayer, e-mail: [Jeffrey.Sayer@iucn.org](mailto:Jeffrey.Sayer@iucn.org)

### III How to go about implementing the LOAM process

The LOAM process consists of seven steps. These are illustrated in Figure 2 and described in more detail below.

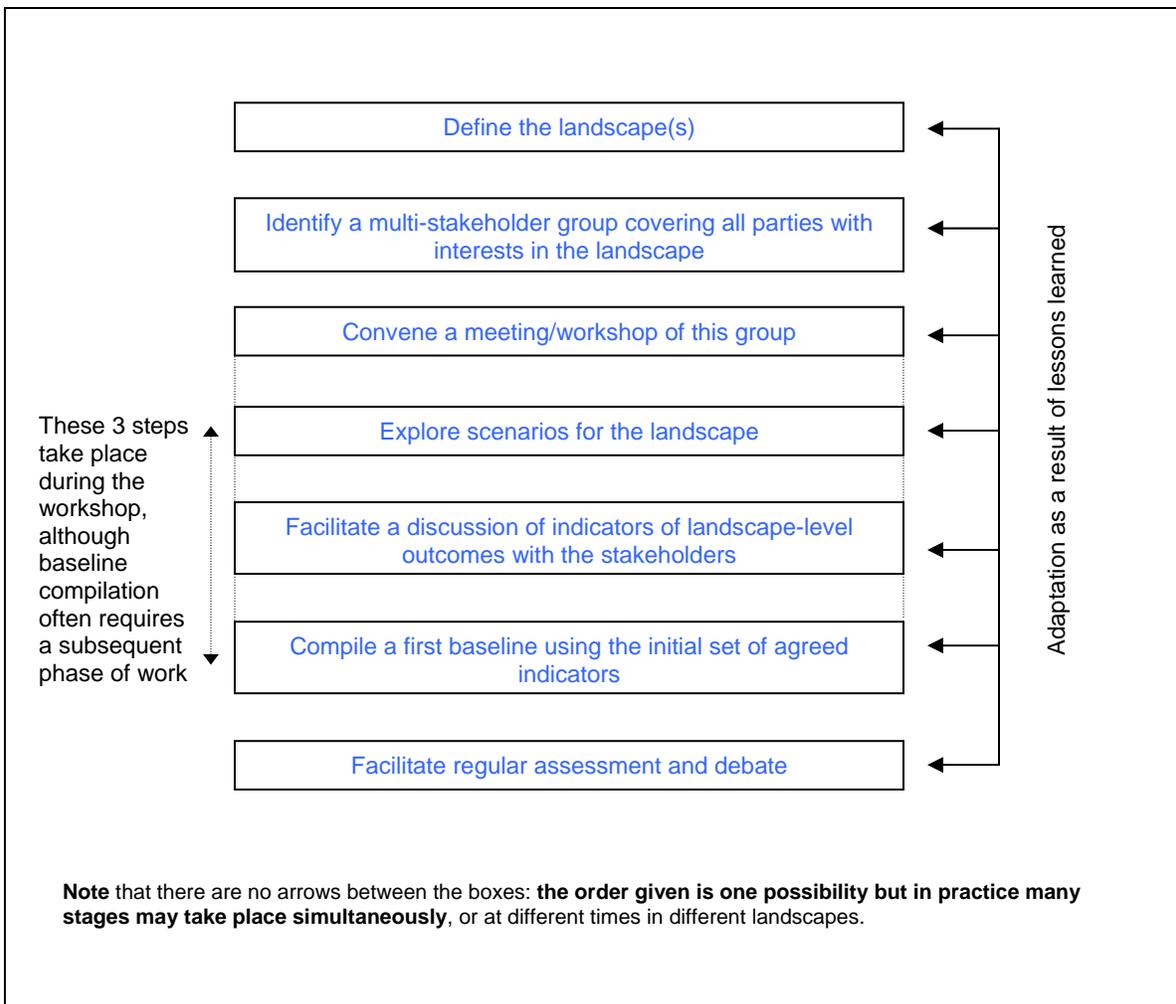


Figure 2. Flow chart outlining a proposed series of key steps for the LOAM process

1. **Define the landscape:** The landscape can be defined in terms of a geographic area or something like the “seasonal range of habitats of a key species”. For the purposes of LOAM the landscape need not have a hard boundary, as they rarely exist as independent bounded systems, and may be defined quite differently from the perspective of different stakeholders. The agreed landscape may often result from the overlay of different perspectives – in keeping with the following definition:

*“A Landscape is a geographical construct that includes not only the biophysical components of an area but also social, political, psychological etc components of that system.”*

2. **Identify a multi-stakeholder group covering all parties with interests in the landscape:** The group should include not only WWF conservation partners but also other interest groups (e.g. social development NGOs, Government representatives from key sectors, private sector, and local community groups), some of whom may have very different visions for the future of the landscape.
3. **Convene a meeting/workshop of the multi-stakeholder group:** try to gather as many representatives from the group above as possible to an initial workshop. Experience has shown that it is rarely possible to get all interests equally represented from the start, but what is important is to initiate a process even with a relatively small group. Then other people may join later as the process develops, and one can also think about employing other approaches to encourage the input of others over time.
4. **Explore scenarios for the landscape:** This should be a facilitated multi-stakeholder process. A good way to start is to ask participants to write on cards those things that would constitute for them the worst possible future of the landscape and those things that would constitute the best possible future for the landscape. Then discuss the “drivers of change” or external factors that will influence the future of the landscape. For example, ask "what will take it to the worst case scenario?" and "what might take it to the best case scenario?"

Three other techniques that can be used to explore scenarios are:

- a. **Analysis of the historical context:** Ask different stakeholders to mark on a long sheet of paper in chronological order the major events in the past that have influenced the landscape. This can lead to a useful debate about why the landscape is in its present state and what might influence its future.
- b. **Drawing the landscape:** Encourage people to draw on a large paper the landscape as they see it. Get them to draw in the things that for them are important in the landscape. It can be useful again to draw worst case and best case landscapes. Make sure that everyone, including marginal and special interest groups get a chance to draw their vision. Getting women and men to draw on separate sheets can be interesting. Lots of variations are possible. Again the idea is to provoke a debate about what is important, what is good and what is bad.
- c. **Develop simulation models:** This can be a powerful tool for developing understanding about the relationship between different parts of the

landscape. We usually use STELLA software but others use SIMULE and lots of options are available. The modelling should be kept as simple as possible – so that the model does not become the “property” of the modeller. With skilled facilitation less well educated people can also actively and effectively participate. The models can be used to explore the flows of benefits (incomes, clean water, biodiversity etc.) from different states of the landscape.

5. **Facilitate a discussion of indicators of landscape-level outcomes:** encourage a discussion with all the stakeholders of what would be indicators of “improvements” in the landscape. It is good to start with flash cards. Give each stakeholder 5 coloured cards and ask them to write down their own list of indicators of progress in the landscape. (It can also be useful to give them cards to list indicators of deterioration). Then group the cards on a board around shared themes or ideas. This can lead to a useful discussion of “*what constitutes success*” This process can take several days and involve field visits etc. It will link closely to the historical analysis, drawing and modelling.



*LOAM workshop in Kwale District, Kenya (East African Coastal Forests), May 2006*

Once there is general agreement on ideas for indicators, proceed to a more formal discussion guided by the points below:

- a. **List the indicators on an excel spread sheet:** group them under five categories (based upon the Capital Assets, or Sustainable Rural Livelihoods Framework used by DFID).

The assets framework<sup>1</sup> encompasses all of the features of a landscape that are likely to be of concern to both WWF and local stakeholders. It makes explicit the fact that some declines in natural values may be necessary, and desirable, in order to achieve gains in human, social and built assets. The assets are:

- i. **Human assets** – e.g. access to education and/or health care facilities;
  - ii. **Social assets** – social organisations, village environmental committees;
  - iii. **Built/physical assets** – quality of housing, access to clean water, roads/accessibility;
  - iv. **Local natural assets** – forest quality, access to water, soil fertility, NTFPs;
  - v. **Global conservation assets** – biodiversity, habitats and environmental services e.g. carbon, water of global value;
  - vi. **\*Financial or economic assets** - household income, level of employment, access to credit.
- b. define about 5 indicators for each of these asset categories: It simplifies things if indicators are defined in ways that allows them to be given a score out of 5
- c. agree the scoring: for each indicator the group must agree and write a definition of what state the indicator would be in to get a score of 1, 2, 3 etc.(1 at the lowest end through to 5 at the top end).

e.g. if the indicator is “Frequency of forest fires”, the scoring might be:

1. Biannual fire penetrating the forest;
2. One fire per annum, some penetrating forest;
3. One fire per annum but stops at forest edge;
4. <1 fire per annum, not penetrating forest;
5. No fire

Other examples of how this has been done in some landscapes can be found in **Annex 2**.

- d. agree on the current score: the scores are then discussed by the group and agreement is reached on what the score is for that point in time. The scores can be combined in several ways and presented graphically using excel graphics techniques – see **section V** below.

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<sup>1</sup> **Note**: The standard assets model includes financial or economic capital as one of the 5 assets. Whilst in many landscapes financial assets are an important element, in some of the studies conducted to date (particularly in rural situations in tropical developing countries), we have found that financial capital is not usually accumulated by the people, and therefore its use appears limited. Conversely in some cases we have found it necessary to add a category of “global conservation” assets (which motivate the presence of international conservation, and other organisations) to distinguish them from “local natural or environmental” assets which clearly yield benefit flows to local people. More discussion on both of these aspects can be found in Annex 1, but essentially the decision on which, and how many assets to use should be made based on what seems to be relevant and appropriate in a specific landscape.

6. **Compile a first baseline using the initial set of agreed indicators:** Whilst a well facilitated and productive workshop may achieve good consensus on a first indicator set and scoring ranges, it is more likely that the framework produced will only be partially complete. For example the latest data for a specific indicator may not be immediately available, or in the most extreme case need to be collected. Therefore it is best to plan for the time of a technically skilled person<sup>2</sup>, or ideally a small team, for post-workshop follow-up to: complete the indicator set and the scoring scales; gather and/or collect the required data; and compile the first baseline assessment. This process in itself will provide a first feasibility test of the proposed indicator set.
7. **Facilitate Regular Assessment and Debate:** After a suitable interval – we have done this yearly – reconvene the group and see if the scores have changed: Two things can happen when you reconvene. First people will challenge the indicators, they will argue that other indicators would have been better or they can challenge the scoring matrix. Debate this – this debate is part of the process. Second you may find that the group has difficulty on agreeing on changed scores. This does not matter; again it is part of the sharing of understanding. What matters finally is that there is a structured debate about whether progress has been made or not.

At these periodic meetings people will argue about what sort of impact various activities, including conservation interventions are having in terms of helping to improve the landscape vis-à-vis the desired outcomes. **This is the most valuable part of the entire process.** It is the key to adaptive management. A major outcome of these periodic meetings should be a revisiting of the (WWF) work plan – are we really improving the landscape? If not, what should we be doing differently?

#### IV Dealing with trade-offs

Not all stakeholders will agree with the importance given by WWF to the biodiversity values of the landscape: There will need to be trade-offs. The indicators should ideally represent the best compromise between what WWF wants and what others want. In some cases you may just have to agree to differ: some stakeholders may refuse to buy-into the process. We have to confront this honestly and openly. There will be cases where there is no shared agreement on what constitutes the “best” landscape. In these situations you simply have to recognise this fact and continue to work on it.

Ways forward can include:

- a. Introducing environmental service payments
- b. Compensating local stakeholders who are deprived of resource access
- c. Developing and applying laws – even if this is unpopular
- d. Seeking compromise
- e. Seriously questioning if we can succeed, and perhaps putting our efforts somewhere else.

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<sup>2</sup> **Note:** Such work can make an interesting student or intern project. However experience has shown that such an arrangement needs careful and close supervision. If someone from outside the landscape is hired to help, then it is imperative that a locally based counterpart is identified and trained alongside them, in order that the work continues to be locally owned, and there is follow-up when the technical support ceases or is reduced.

You may be disappointed that little change in the indicators is apparent over a year or two. This is often the case and is a reflection of the fact that either the combination of interventions in that landscape is wrong or the focus needs to be improved. Often we have learned that our ability to influence outcomes at these large scales also requires intervention through lobbying and advocacy on policy at the national or even international level.

What can emerge is that when significant changes do occur they may be provoked by external economic or political factors that in some cases are outside the influence or beyond the control of our interventions.

What all this means is that we should take opportunities to develop targeted advocacy work to influence governmental decision-making processes towards the outcomes we desire.

The LOAM can provide important evidence for colleagues working at the policy level about the impact (good or bad) that certain policies are having at the landscape scale, and therefore where there is need for them to target their interventions.

### **Commonly used indicators**

Similar indicators tend to emerge from these processes wherever we have applied them. However we strongly advise against going into a multi-stakeholder meeting with a pre-cooked list of indicators. The process of building shared visions requires that stakeholders can all contribute and feel ownership of the process.

However it does help if the facilitator has some experience of the sort of indicators that work and those that are difficult to reach agreement on or are difficult to measure objectively. Some examples of indicators that come up often are the following.

#### Global conservation assets

- Forest extent – or rate of deforestation/degradation
- Numbers of a key species – e.g. pandas or gorillas
- Frequency of forest fires
- Integrity of critical habitats – e.g. wetlands, grasslands, forests

#### Local natural assets

- Quality of water
- Accessibility of drinking water
- Availability of non-timber forest products
- Erosion

#### Human assets

- Child mortality
- Availability of health care
- Availability of education
- Skills and education levels, and opportunities

#### Social assets

- Levels of corruption
- Effectiveness of the administration

#### Social Assets (continued)

- Equity in application of laws
- Existence of community based resource management groups
- Respect for traditional resource management rules
- Social organisations

#### Built/physical assets

- Road access
- Plantations as providers of employment
- Quality of housing – number of tin roofs
- Local processing industries – sawmills etc.

#### Financial/economic assets

- Income from timber or NTFPs
- Employment from tourism, local estates
- Total household income
- Access to credit.

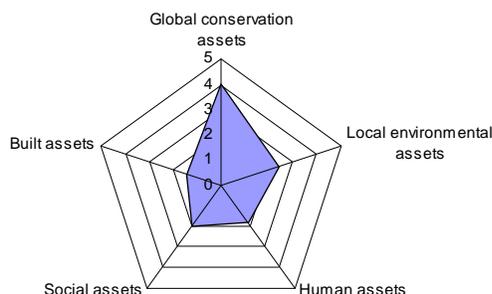
More examples of indicators identified by stakeholders in 3 landscapes where WWF is active can be found in **Annexes 2 and 3**.

## V Presentation of Results

The results of these indicator measures can be presented and analysed in several ways, depending upon the objectives and the audience. One way that we have found useful and easy to understand is in the form of a Radar diagram (see Figure 3 below) showing the scores of each of the asset categories separately. To do this the indicator scores have to be placed in an excel spreadsheet as in the Excel demo in Annex 4 (sheet 1). The average of the 5 indicator scores for each asset category are summarised in a separate Excel spreadsheet (sheet 2).

Click on the “Chart wizard” icon in the tool bar. Scroll down “chart types” to the “radar diagram” icon. Click on this and then follow the prompts.

Figure 3. A simple radar diagram output from an Excel spreadsheet, as described above.



Other methods of presenting results might include:

- Line graphs to show the change in a single indicator, or averaged asset value over time;
- Pie charts to show the ratio between two variables within an indicator, e.g. for type of roofing used: tin sheets vs. coconut fronds;
- Simple bar charts can be used, if it is useful to compare single indicator, or average asset values between different villages, or other sub-sections of the landscape, perhaps to show the impact of greater distance from main infrastructure services such as roads and mains water supply.

## VI Analysis and Use of Results

Regular assessments, perhaps on an annual basis, produced by an updated scoring of the selected indicators under each of the asset categories will again, when averaged, provide a series of radar diagrams at different points in time which can be compared. This will allow comparison between scores from year to year, and also allow more detailed analysis of changes at the level of individual indicator. One can then begin to draw conclusions on the changes in the landscape in terms of each of the key indicators and assets: are things improving, declining or about the same?

The radar diagrams also allow one to explore the interactions between the different assets. For example, if the baseline assessment shows a relatively high score for physical assets, but the natural asset score is low – does this mean that the landscape has experienced a significant amount of construction and infrastructure development at the expense of the natural environment? Does a landscape with a relatively high score for social and human assets, against a low economic score show that social and human assets are more highly valued, or that the landscape is relatively poor economically, because most of the natural assets have been removed or severely depleted?

Figure 4 shows radar diagrams for two different villages in Indonesia where it is interesting to compare the values for each asset within and between villages.

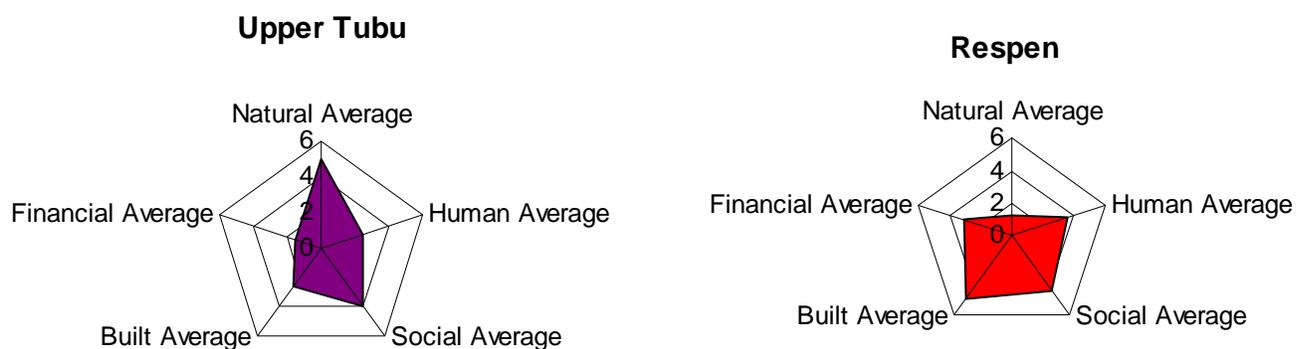


Figure 4. Radar diagrams for two villages in Indonesia (Source: Intu Boedhihartono – unpublished data.)

Repeated analysis over several years can begin to show how the assets scores and the balances between them are changing over time.

We are still very much at the piloting and development phase of the LOAM. To date, the number of landscapes where the LOAM process has been underway for one year or more is very small, so we are unable to draw too many conclusions at this point. Nevertheless there are already clear signs that initiating the LOAM process can help us, and other stakeholders, to understand better how conservation projects can and are having an impact at a landscape level.

Indeed the very process of bringing the different stakeholders together to discuss and debate their views and aspirations for the future of their landscape is beneficial. It quickly helps to build a shared understanding of each other's values and needs from the landscape, and helps develop a common interest in developing ways of sustainably managing and regularly monitoring the condition of its key assets.

Using this greater awareness and improving knowledge can help us to better plan and adapt our own activities to influence the activities of others, in order that we are having a positive impact on the future of that landscape, both for biodiversity conservation and also for the well-being of the people who depend on it.

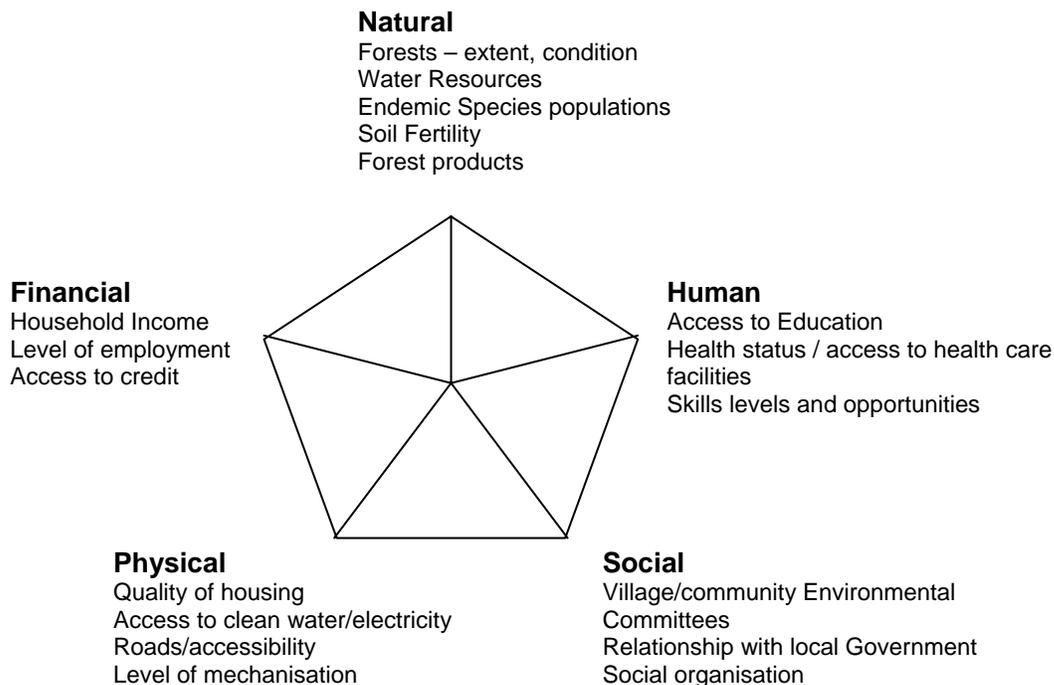
## **VII Key References**

**Carney D. et. al. (1998)** *Sustainable rural livelihoods: what contribution can we make?* Department for International Development, London

**Sayer J. et. al. (2006)** *Assessing environment and development outcomes in conservation landscapes.* Biodiversity Conservation DOI.  
<http://dx.doi.org/10.1007/s10531-006-9079-9>

## Annex 1: The Assets Framework

The framework is based around 5 capital assets – natural, human, physical (built), social, and financial\* and has widespread application in both private sector and rural livelihoods contexts. The term “capital” assets reflects use in an economic or business sector context – hereafter we will refer to them simply as “assets”. In the context of conservation and development projects, the assumption is that the long term well-being of people will be determined by the benefits that flow from these assets. The figure below lists some examples of those features or indicators which might typically contribute to the value of a particular asset.



The background and rationale for this approach is described in the ‘Sustainable Rural Livelihoods’ framework of Carney et al. (1998). Landscape scale projects attempt to enhance the assets in an area in order to achieve a better balance between natural assets (the environment) and the other assets (human, social, physical and financial) that are the usual targets of development projects. Many conservation projects attempt to enhance the flow of benefits to local people from innovative uses of natural assets. Ecotourism and sustained harvesting of natural products are common examples.

Use of the assets framework can also allow comparisons between the flows of benefits from natural assets and those from the other assets, for example whether increasing the natural asset reduces the benefit flows from the other assets and conversely whether increasing flows of benefits from, for instance, physical assets, inevitably reduces the flows from natural assets.

Note: re. practical application at the scale of landscapes

In applying the assets framework to conservation and development interventions at the scale of landscape mosaics we have encountered a number of problems that have led us to adapt the approach. The principle adaptations are as follows:

1. In rural situations in tropical developing countries we have found that financial capital is not usually accumulated by the people. Such financial capital as may exist is very unevenly spread amongst the population and is not amenable to measurement by outsiders. Financial capital has never emerged as an indicator of the state of livelihoods in the participatory processes that we have conducted. We have therefore ceased to attempt to measure financial capital. Household income is frequently an indicator of livelihood status but is always derived from and thus an indicator of one of the other asset categories.

Conversely in scoping out the potential application of the LOAM approach with a private sector company owning/managing plantations across the landscape (and keen to monitor the wider impact in terms of biodiversity and livelihoods) in an industrialised country and employing local people living in the landscape, it was felt essential to include financial capital in the assets framework here.

2. Global environmental values such as rare or endangered species, carbon stocks etc were almost never identified in participatory processes as environmental assets that indicated livelihood status. In participatory processes such natural assets as clean water, lack of soil erosion, availability of non-timber forest products, bushmeat etc. were often identified. Natural or environmental assets therefore fell into two distinct categories, those that yielded benefit flows to local people and those that motivated the presence of international conservation organisations (our clients). We have therefore found it practical to distinguish local natural assets and global natural assets. The identification of the global natural asset indicators thus falls outside the participatory process and is the role of the conservation organisations.

However as above, in the industrialised country context there was a different perception, where it was felt that any global environmental values were incorporated into consideration of natural/environmental assets and therefore there was no need for a separate global category.

\* \* \* \* \*

## Annex 2. Examples of Indicator measurement descriptions using the Likert Scale from 1 - 5

### LIVELIHOOD INDICATOR MEASUREMENT DESCRIPTIONS – EAST USAMBARA MOUNTAINS (TANZANIA)

	1	2	3	4	5	Change since previous year (+ 0 -)
<b>NATURAL CAPITAL</b>						
Village forest reserves	no progress	discussion initiated village level	approved by village	approved by district council	management plan implemented	
Water riparian strips protected	no protection	awareness of need for protection	some protection	widespread protection	all riverbanks restored	
Presence of trees in gaps (corridors)	no trees	discussion about planting	nurseries established	some tree planting	lots of tree planting	
Native species planted in corridors	no native species	discussion about planting	nurseries established	some tree planting	lots of tree planting	
Enhancing/encouraging natural regeneration in corridors	no enhancement	some enhancement	enhancement	significant enhancement	abundant natural regeneration	
<b>SOCIAL CAPITAL</b>						
Village (environmental) NR committees	not established	some discussion of establishment	committee established	committee active	committee effective	
Village participation in landscape level	no networks	establishment of networks	local networks effective	establishment of landscape level networks	landscape level networks effective	
Joint Forest Management	no JFM	initiation of JFM discussions	JFM established	JFM agreement signed	fully operational JFM	
Awareness of zones/boundaries	no awareness	some uncertainty	some progress in recognition	boundaries mostly recognised	boundaries clearly recognised	
Management of village finances	very poor management	some management capacity	intermediate management	good management	excellent, transparent process	
<b>HUMAN CAPITAL</b>						
Education (primary school distance)	no access to school	school more than 1 hours walk	school outside village, but < 1 hour walk	school in village, but facilities poor	good quality school accessible	
Health (e.g. no. clinics)	no access to health service	health service > 1 hours walk	health service < 1 hour walk (but not in village)	health service in village, but facilities poor	good quality health service	
Skill levels and opportunities	no access to skill opportunities	limited access to skill opportunities	average access to skill opportunities	above average skills and access to skill opportunities	good level of skills and skill opportunities	
Health status of village	significantly below average	below average	average	above average health	good health	
Involvement in innovative projects	no involvement	some involvement	average involvement	much involvement	a lot of involvement	

	1	2	3	4	5	Change since previous year
<b>PHYSICAL CAPITAL</b>						
Quality of housing	very poor housing/deteriorating	all houses with grass roofs	some houses with tin roofs	many tin roofs	all concrete/brick houses with tin roofs	
Water supply	1 hour or more to access water	periods of water shortage	access to (nearby) water all year	piped water available to some people	piped water available to all	
Electricity	no electricity or generators	minimal access to generators	many with access to generators	some people with access to grid electricity	all people with access to grid electricity	
Roads/accessibility	bad quality - Seasonal access by 4WD only	4WD access all year	average access	good all weather access	all weather saloon car access	
Telecommunication	none	very few people with cell phones	some with cell phones	average number with cell phones	Most people with cell phones	

<b>FINANCIAL CAPITAL</b>						
Income from tree forest products (on-farm)	no income	minor income source	moderate income source	significant income source	major income source	
Income from tree forest products (off-farm)	no income	minor income source	moderate income source	significant income source	major income source	
Income NTFPs (medicinal plants, honey, butterfly )	no income	minor income source	moderate income source	significant income source	major income source	
Income from agriculture/livestock	no income	minor income source	moderate income source	significant income source	major income source	
Employment (e.g. tea estates)	no income	minor income source	moderate income source	significant income source	major income source	
Employment from other activities (e.g. tourism etc)	no income	minor income source	moderate income source	significant income source	major income source	

## CONSERVATION INDICATOR MEASUREMENT DESCRIPTIONS - FOR EAST USAMBARA MOUNTAINS (TANZANIA)

	1	2	3	4	5	Information source	Available information
<b>BIODIVERSITY INDICATORS</b>							
<b>Deforestation</b>	<0.1 % loss per annum	<0.05 % loss per annum	<0.025 % loss per annum	Stable	Gain	CMEAMF/CI/CABS/BirdLife/WCS	product under development
<b>Fragmentation</b>	number of gaps increasing	Stable	Decline from 6 to 5 gaps	Decline from 6 to 4 gaps	Decline from 6 to 0 gaps	WWF/TFCG project	GIS under development
<b>Forest condition</b>	>3 trees and >10 poles per 50 m section (no canopy)	>1 tree and >1 pole cut per 50 m section	1 tree and 1 pole cut per 50 section	<1 tree and <1 pole cut per 50 m section	Zero tree or pole cuts (canopy intact)	??	Some old data from Frontier and CMEAMF
<b>Forest condition</b>	Biannual fire penetrating forest	One fire per annum some penetrating forest	One fire per annum but stops at forest edge	<1 fire per annum, not penetrating forest	No fire	??	CMEAMF
<b>Forest condition</b>	Invasive species occupy more than 50% of former natural forest	Invasive species increasing	Invasive species stable	Invasive species declining	Invasive species eliminated		
<b>Biodiversity value (lowland)</b>	Sokoke scops owl not relocated	Sokoke scops owl major decline	Sokoke scops owl minor decline	Sokoke scops owl stable	Sokoke scops population increasing	CEPF small grant SD4	Baseline from 1994 for lowlands (Tom Evans)
<b>Biodiversity value (lowland)</b>	Group of indicator taxa not relocated	Group of indicator taxa major decline	Group of indicator taxa minor decline	Group of indicator taxa stable	Group of lowland indicator taxa increasing (Swynnertons robin, East coast akalat, Pale-breasted Illadopsis)	CEPF small grant SD4	Link to Newmark/Cordeiro index of change for the montane species

<b>BIODIVERSITY (Continued)</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Information source</b>	<b>Available information</b>
<b>Biodiversity value (upland)</b>	Group of indicator taxa not relocated	Group of indicator taxa major decline	Group of indicator taxa minor decline	Group of indicator taxa stable	Group of upland indicator taxa increasing (Spot throat, Dabble mountain robin, Olive thrush, Long billed tailor bird, Amani Sunbird, Banded Sunbird, Usambara Hyliota and Tanzania Mountain Weaver)	CEPF small grant SD4	Newmark/Cordeiro netting studies data and Cordeiro/WCST monitoring LoI
<b>Biodiversity value (general)</b>	Eastern Arc endemic and near-endemic species not found		All Eastern Arc endemic and near-endemic taxa persist		Healthy populations of all Eastern Arc endemic and near-endemic taxa		

### Annex 3: More examples of first Indicator sets defined through scoping workshops with key stakeholders in 2 landscapes

CHEFCHAUOEN LIVELIHOOD INDICATORS (MOROCCO)	CONGO BASIN LIVELIHOOD INDICATORS (Central African Republic)
<b>SOCIAL CAPITAL</b>	<b>SOCIAL CAPITAL</b>
Community NRM institutions	Community based initiatives e.g. CBNRM
Local networks in landscape	Gouvernance étatique (effectif d'ONG en activite)
Awareness/transparency of boundaries/zones	Gouvernance traditionnelle (litiges, participation de toutes les composantes sociales a la gestion des affaire de la communauté, efficacité du chef...)
Co-operation b/n local institutions & forestry dept.	Corruption (niveau de corruption de la fonction publique)
	Niveau d'activité associative
<b>HUMAN CAPITAL</b>	<b>HUMAN CAPITAL</b>
Education (e.g. number of schools/distance to schools)	Quality of clinics/health care
Health (e.g. incidence of death from serious disease)	Quality of education
Capacity building for women	Number of qualified people
Local sustainability initiatives	Taux de mortalité infantile
	Connaissances traditionelles
<b>PHYSICAL CAPITAL</b>	<b>PHYSICAL CAPITAL</b>
Rural access to roads	Moulins à manioc
Mechanisation (number of...)	Qualité d'habitation
Housing quality	Nombre de Commerces
Rural electrification	Nombre de point d'eau potable
Village water supply	Accessibilité
	Moulins à manioc
<b>NATURAL CAPITAL</b>	<b>NATURAL CAPITAL</b>
Forest reserves available to village	Taux de deforestation
Level of erosion	Incidence feux
Water health	Population elephants
	Populations Gorilles
	Forêt certifiée

<b>MOROCCO</b>	<b>CENTRAL AFRICAN REPUBLIC</b>
<b>FINANCIAL CAPITAL</b>	<b>FINANCIAL CAPITAL</b>
Income from NTFP's (e.g. cork and honey)	Nombre d'emploi au secteur formel
Income from timber	Revenue des ménages
Income from agriculture	Evolution des prix des 3 produits de base
Total household income	Nombre de tontines
Employment from tourism	Evolution du cheptel

## Annex 4: How to create Radar diagrams in Excel

(N.B. See also the Excel file which accompanies this paper)

**Sheet 1:** Indicator scores are placed in an excel spread sheet

<b>Global conservation assets</b>			
Indicator 1	4		
Indicator 2	3		
Indicator 3	4		
Indicator 4	4		
Indicator 5	5		
<b>Average</b>		<b>4</b>	
<b>Local environmental assets</b>			
Indicator 1	3		
Indicator 2	2		
Indicator 3	2		
Indicator 4	2		
Indicator 5	3		
<b>Average</b>		<b>2.4</b>	
<b>Human assets</b>			
Indicator 1	2		
Indicator 2	1		
Indicator 3	1		
Indicator 4	3		
Indicator 5	2		
<b>Average</b>		<b>1.8</b>	
<b>Social assets</b>			
Indicator 1	3		
Indicator 2	2		
Indicator 3	2		
Indicator 4	1		
Indicator 5	2		
<b>Average</b>		<b>2</b>	
<b>Built assets</b>			
Indicator 1	1		
Indicator 2	1		
Indicator 3	2		
Indicator 4	1		
Indicator 5	2		
<b>Average</b>		<b>1.4</b>	

**Sheet 2:** The average of the 5 indicator scores for each asset category are summarised in a separate Excel spread sheet.

Click on the “Chart wizard” icon in the tool bar. Scroll down “chart types” to the “radar diagram” icon. Click on this and then follow the prompts, in order to produce the radar diagram shown below.

