

Methodological Framework
**An internal scoping report of the project Strategies for Increasing
Human Resilience in Sudan: Lessons for Climate Change
Adaptation in North and East Africa**

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Methodological Framework

An internal scoping report of the project *Strategies for Increasing Human Resilience in Sudan: Lessons for Climate Change Adaptation in North and East Africa*

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This report has been developed to serve as an internal “blueprint” for the research component of the joint HCENR/SEI-B project. Here, we scope out the terms of our project methodology, to be revisited and revised as internal understanding of the work grows.

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1. Background

This project is motivated by the observation that existing resilience-building strategies – whether directed toward household, community, sectoral, or even ecosystem resilience – can be effective at increasing the capacity to cope with and adapt to climate-related impacts, and that these strategies could be built upon for climate change adaptation. More specifically, the project is based on the following premises:

- a) increasing the coping capacity of the most vulnerable groups to *today's* climate-related impacts must be a pre-eminent goal of adaptation;
- b) developing countries are especially in need of adaptation strategies that are consistent with national sustainable development goals;
- c) methods have been developed in separate fields of practice – sustainable livelihoods, environmental management, disaster mitigation – which can meet both of these needs;
- d) if the needs of the most vulnerable people are prioritized in national decision-making, then small-scale, community-level strategies will be needed to supplement the large-scale, technical/structural approach that is likely to dominate adaptation planning. However, there is a need to provide decision-makers with information on these small-scale strategies;
- e) and lastly, these sorts of strategies – i.e., that increase the adaptive capacity of the most vulnerable people while mitigating near-term environmental impacts (e.g., slowing desertification) – can diversify and strengthen national adaptation plans of developing countries.

It is these types of strategies that we intend to identify, explore and discuss, making them accessible, understandable and useable to the policy-making process. Case studies, including a policy analysis component, will serve as the primary research tool for this purpose.

Research Goals

In essence, the project hypothesis is that sustainable livelihoods can fill the practical and conceptual gap that exists between local vulnerability to climate change and national/intergovernmental policy processes. More specifically, just as the term ‘sustainable livelihoods’ is used to describe both an approach to human development and a framework for analysis, the project’s hypothesis consists of two similar elements: first, that the sustainable livelihoods *approach* can respond, on the ground, to climate change adaptation needs of the most vulnerable groups, and second, that the sustainable livelihoods *framework* can facilitate the process of adaptation assessment, policy-making, and implementation. The project aims to respond to this hypothesis by employing the framework to assess the impact of the approach on community resilience *and*, by using policy process analysis, to define the linkages of the approach to the larger policy process.

With this in mind, the purpose of the case studies – the central research element of the AIACC Sudan project – is to enable the project to show that certain sustainable livelihoods (SL) measures operate as climate change adaptation options and that such measures can (and should, given the numerous co-benefits) be integrated

- into the planning of national adaptation strategies. So that the project can make this claim, the goal of the case studies is to clarify and establish the following:
- (a) that certain sustainable livelihoods (and natural resource management) measures increase a community's resilience to today's climate-related shocks. To show this, case studies will involve collection and analysis of 'resilience indicator' data – data on the protection and promotion of livelihoods.
 - (b) and on a methodological level, that it is possible to determine how such measures can be effectively implemented, supported and up-scaled, for lasting impact. To show this, each case study will provide an assessment of the local and national policies and conditions, as well as the implementation strategies that support or inhibit successful measures.

Within these overarching project goals, the case studies themselves have the following specific objectives:

- (a) Identify vulnerable communities (i.e., vulnerable to drought, other climate impacts) where successful SL measures have been put in place and using community consultation, confirm the success of the measure.
- (b) Generate informative background material on each community's unique context, vulnerabilities, assets, coping strategies, etc.
- (c) Within each community, employ a suite of quantitative and qualitative methods to measure community resilience to climate-related impacts, with and without SL intervention.
- (d) Employ policy and cross-scale analysis techniques to explore the relationship between community resilience-building activities and micro-, meso- and macro-scale policies, institutions and processes.
- (e) From the above, draw lessons for increasing community resilience with SL strategies – while achieving multiple additional benefits – that can be applied to adaptation and related processes.

Research Scope

Drawing from existing research platforms, the project research consists of three interlinked processes – the *empirical*, in which background information is gathered and organized, the *analytical*, in which case studies are carried out, and the *participatory*, in which community input, validation and guidance is sought.¹ Within the analytical process, the project will use the sustainable livelihoods framework to enable researchers to measure resilience at the local level to climate-related impacts. With this approach, the following research scope is proposed:

- a) The project will undertake four separate case studies in Sudan. Case studies will be concerned with current and recent historical experience, and are likely to focus on the experience of the 1980s through to the present.²
- b) To ensure adequate coverage of Sudan's rural circumstances, and adequate representation of the Sahel, as well as North and East African circumstances, each case study will focus on a distinct ecosystem sub-type (such as rangelands, forested

¹ See, e.g., the *Strategic Environmental Framework for the Greater Mekong Subregion* (SEI and ADB, 2002)

² This wide time horizon has been chosen to capture the infamous drought of 1983-1984 (persistent regional drought) that severely impacted Sahelian Africa.

lands (e.g., the gum arabic belt), semi-arid plains) or agricultural system type (such as gum arabic production, rain-fed shorgum production, animal husbandry) along the agricultural-pastoral continuum.³

- c) Each case study will focus on a single community or group of communities within an ecological/agricultural system as its unit of research.
- d) Each case study will explore examples where “local” knowledge (e.g., traditional, indigenous, autonomous, informal) and/or “external” knowledge (e.g., formal, technical, directed) has been applied within a target community, in the form of an SL strategy, to enable the community to cope with or adapt to climate-related stress.
- e) Case studies will compare a community’s vulnerability to climate extremes, pre- and post-SL intervention. In cases where collection of historic information is not possible, “signal” events (i.e., major historic climatic events) and role-playing will be relied upon.
- f) Case studies will be conducted by commissioned researchers, through desk-based and field research, over a four-month period.
- g) Finally, it is important to note that the project will select case studies based in part on advance knowledge that the case represents a *successful* example of SL measures reducing community vulnerability to drought. The project will accept, based on the output of an initial scoping exercise and direct community consultation (discussed below), that a set of measures is effective, and will focus instead on (1) the extent to which these measures increased resilience, and (2) why? (i.e., because of what local, national, regional policies and conditions?)

Each of these points is discussed below in some detail.

Methodological Approach

The following major elements comprise the project’s methodological approach. Specific steps involved in the case studies are outlined in section five.

Climate variability and extremes as a proxy for climate change:

Despite tremendous progress in the science surrounding climate change scenarios, it is not currently possible to rely upon existing scenarios for Sudan (see, e.g., the First National Communications (HCENR, 2001)), or for many countries to confidently assess the impacts of climate change on vulnerable communities. Instead, vulnerability to *current* climate variability is increasingly being used as a reliable proxy for vulnerability to climate change. This approach does not equate present climate extremes with future climatic conditions; rather, a number of sources have suggested that the degree to which a sector, community, or system is adapted to today’s climate extremes and variability can serve as an indicator of how vulnerable or resilient that system is likely to be to future climate change conditions. According to the

³ The project is likely to favor the use of agricultural systems, as these tend to be most representative of other locations at the national and regional levels. Data on agricultural systems is more readily available and tends to be more reliable. Moreover, much of the traditional knowledge developed by communities for drought-proofing is oriented around crop and food production systems.

IPCC WG II (Summary for Policy Makers, 2001), for example, “Experience with adaptation to climate variability and extremes can be drawn upon to develop appropriate strategies for adapting to anticipated climate change”. In other words, for vulnerable communities and agricultural systems, the most logical first step in adapting to climate change is to assess and, where necessary, increase their level of adaptation to current climate-related stressors.

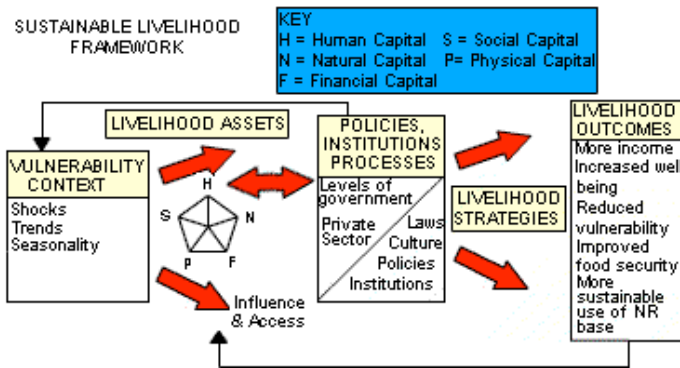
For each case study, a discrete climate-related event - past or ongoing - will be identified, around which the case study will be constructed. Where possible, the impact on a community of *two* separate events will be assessed – one pre-intervention, one post-intervention. In cases where more recent interventions are being examined, a historic climate stressor may be used as a “signal” event, which the community can project onto its current circumstances through role-playing, for the purposes of considering its current resilience to similar hypothetical impacts.

Sustainable livelihoods approach, framework and assessment tools:

The sustainable livelihoods approach sees poverty as vulnerability to shocks, and seeks to reduce vulnerability by building on the livelihood assets of households, increasing their access to a blend of assets and gradually building household resilience. Basically, the approach seeks to enhance existing coping and adaptive strategies in the manner most suited to the community’s needs. The present project seeks to clarify the potential role of the SL approach for increasing people’s resilience to climate change, thus enabling them to adapt.

Over the past decade, the sustainable livelihoods approach has gained prominence in development work and has begun to be used in a great number of settings. Several major development agencies (e.g., DFID, CARE, UNDP) have developed their own unique frameworks for describing and applying the approach (i.e., for presenting the primary influences on people’s livelihoods, and the typical interactions between these), though each adheres to a core set of ideas (as outlined in Annex 5). The AIACC Sudan project is not wedded to a single framework and is instead using its own variant (outlined in section 5), drawing methods from those used by major development agencies (DFID, CARE and UNDP) and from a variety of past assessment experiences. Some of the benefits of using an SL framework are that it “provides a checklist of important issues and sketches out the way these link to each other; draws attention to core influences and processes; and emphasizes the multiple interactions between the various factors which affect livelihoods” (see DFID Guidance sheets). But as DFID suggests, SL frameworks should be used flexibly and adapted to suit specific contexts. The AIACC Sudan project will use the DFID model outlined below, along with the notion of the five capitals (natural, physical, human, social and financial), in order to capture perceptions of resilience in the data collection process. See section 5 for more detail.

DFID's Sustainable Livelihoods Framework:

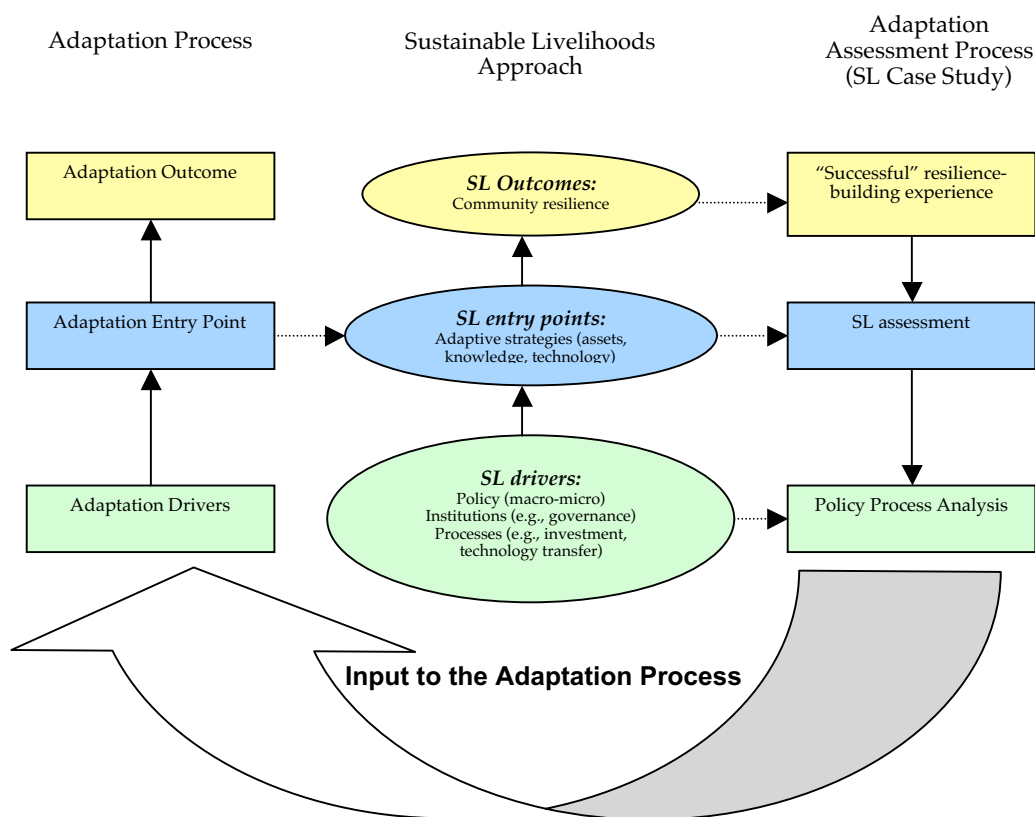


Source: http://www.livelihoods.org/info/guidance_sheets_pdfs/section2.pdf

As use of the SL approach has expanded, organizations have developed and applied assessment tools – impact assessment, monitoring and evaluation, etc. – in order to measure the effectiveness of projects in actually lowering people’s vulnerability. From the range of assessments undertaken, a general approach has taken shape which draws heavily from a number of existing methods.

Sustainable livelihood assessment is intended to generate an understanding of the role and impact of a project on enhancing and securing local people’s livelihoods. As such, it relies on a range of data collection methods, a combination of qualitative and quantitative indicators and, to varying degrees, application of a sustainable livelihoods model or framework. Though differences exist, most assessment strategies apply some form of an asset-based approach; most encourage examination of micro-macro linkages; most employ some degree of participatory research methods. By and large, the way that these assessment methods frame the problem and respond to the question of livelihood impact make them highly suitable to the goals of the current project.

The image below uses an adapted version of the UNDP approach to sustainable livelihoods to outline the way in which the project is conceptualizing the SL assessment process and its linkage to the larger



process of adaptation. The UNDP approach to sustainable livelihoods may be the most compatible with the project's overall research goals, while the DFID framework provides a useful tool for use within the case study process itself.

Successful resilience-building experiences:

The AIACC SUDAN project is motivated in part by an understanding that successful examples exist (notably, in the linked fields of sustainable livelihoods and natural resource management) of efforts to increase the resilience of communities to climate-related shocks. Numerous reports exist, documenting project impacts and assessing success. It is therefore not the goal of the present project to establish *whether* selected SL strategies have been successful, but rather to clarify (a) the nature of that success, and (b) its enabling factors behind that success.

Success, however, is a subjective term, requiring judicious use. The AIACC Sudan project will therefore study only those experiences that the communities themselves deem to be successful – according to community-

defined terms such as ownership, impact on asset base, sustainability, institutional linkages, etc. If necessary, multi-criteria assessment may be used to generate a comprehensive picture of the “success” of a given activity in increasing a community’s resilience. The criteria used in this process can also serve as the basis for developing resilience indicators (at a later stage) on the part of the community.

Thus, the project is entirely bypassing the process of vulnerability assessment. This is in part because climate vulnerability in much of Sudan is extremely homogeneous – i.e., communities are by and large vulnerable to the impacts of low rainfall and drought.

Targeted Participation:

Stakeholder participation is seen as a key component of research that seeks to directly address human needs. Though the current project is one step removed from direct community-level development activity, the reliance of the case studies on a locally-driven assessment of resilience makes it essential that community participation be a mainstay of the work. The challenge to the AIACC Sudan project arises from the limited funds and short time-span available to the case study process: there is neither budget nor time for extended direct observation and multiple community consultations. As a compromise, the project will make use of a range of the most appropriate participatory tools, including participatory rural appraisal (e.g., ‘word picture’ development), household surveys, intra-household interviews, role-playing, and community-wide validation workshops.⁴

Resilience indicators:

Borrowing from C.S. Holling and colleagues, we refer to resilience here as the capacity of a system (social and/or ecological) to tolerate disturbance without collapsing into a qualitatively different state. Resilient communities, therefore, can withstand shocks and rebuild themselves if necessary.⁵ With this thinking, we can see vulnerable (often poor) communities as those incapable of withstanding and recovering from climate impacts, and conversely, resilient communities as those that *are* capable of coping with them and recovering. Bearing in mind the sustainable livelihoods literature, which equates poverty with vulnerability and prescribes the fostering of sustainable livelihoods as a mechanism for enhancing coping and adaptive capacity, the role of sustainable livelihoods in increasing resilience to climate impacts becomes clear. But how to measure this role? The AIACC Sudan project is relying on several existing tools, developed for monitoring and assessing the impact of sustainable livelihoods on communities; with the guidance provided therein, the project has adopted a fairly simple approach to developing and using resilience indicators, as outlined in section 5.2.

⁴ See, e.g., Bond and Mukherjee (2002); Turton (2001).

⁵ See The Resilience Alliance: <http://www.resalliance.org/whatisresilience.html>.

The use of indicators – to measure sustainable development, poverty reduction, ecosystem resilience, etc. – is a notoriously challenging task, tending to lean too far toward either the quantitative or qualitative extremes. However, consensus is emerging in the sustainable livelihoods field that application of an appropriately balanced blend of both types of indicators can offer up realistic and informative assessments of changes in livelihood security and community resilience.⁶ Both types will be combined for use with the LAST (livelihood asset status tracking) system (Bond and Mukherjee, 2002), outlined in section 5.2. This tool is essentially a quality of life index, combined with the SL framework's use of assets. In developing indicators of community resilience, the AIACC Sudan project is planning to use community consultation, word picture construction, and local informant validation, as outlined below.

Micro-Macro Linkages:

A primary goal of the AIACC Sudan project is to draw lessons from the micro scale that are relevant to the macro scale, and vice versa. By developing this understanding, project partners hope, ultimately, to inform a process of scaling up (or scaling out) of relevant SL activities for climate change adaptation. At the macro scale, the project seeks to influence key policy processes – particularly, national adaptation planning and relevant national decision-making in, e.g., poverty reduction, disaster mitigation, biodiversity conservation, water resources, forest management, etc. To do so requires an understanding of the interplay between local livelihood conditions and the “range of policies, institutions and processes which support or hinder them” (Goldman, 2000). This connection is of central interest in the sustainable livelihoods approach; however, there is no seminal guidance on how such lessons can be gleaned.

To develop this understanding, AIACC SUDAN case studies will involve a distinct step of policy process analysis. This analysis will be based on the approach developed by the project “Improving Policy-Livelihood Relationships in South Asia”.⁷ It should be noted that while the South Asia process is designed in part to understand how policies take shape and can be influenced, our focus is more narrowly focused on understanding the ways in which existing policy supports or inhibits sustainable livelihoods activity. Ultimately, we hope that this can enable supportive policies to be encouraged through the adaptation process, and inhibiting policies to be corrected.

Nested Assessment:

To facilitate the generation of case study lessons, particularly for the policy process, case studies will use a nested assessment approach. With this approach, researchers will focus analysis first on the household, next on the

⁶ See, e.g., Turton (2001), Marshland *et al.* (2001), Hussein (2000), Rennie and Singh (1996).

⁷ See <http://www.geog.leeds.ac.uk/projects/prp/>

community, and next, through the policy analysis process, on the micro-region, the sub-national context, and finally, the national or regional context.

Validation:

Given the subjective nature – and even sensitivity – of the data to be collected (e.g., measures of household income, assets and self-sufficiency), a validation or quality-check will be conducted at three levels. First, the community at large will be used as a sounding board for the general themes emerging from the data. At the community level, informal triangulation will be used to cross-check and confirm patterns and findings. Second, the local informant will provide a critical review of data. Third, task force members will conduct a careful examination of the data, seeking to identify and distinguish misleading information from that which it considers valid.⁸ Questions from the task force review will be referred back to the case study researcher for clarification and validation.

Case Study Protocol

The project involves four separate case studies – each involving travel, fieldwork, data collection, analysis and writing. Commissioned experts will conduct the research and writing with the support and close collaboration of the project partners. It is expected that case study reports will be prepared in such a way that their results can be compared and synthesized into a set of project findings. Given this, it is clearly critical that each case study researcher closely follow a carefully designed research protocol, as outlined below.

It is anticipated that each case study will require modest adaptations of the project's data collection methods outlined below, in order to suit the unique community context. The goal in developing and using this instrument is to identify the richness of a community's experience and avoid reductionism, while at the same time, gathering comparable information. Nevertheless, it is expected that the main components of our approach will be applied. Case study research is divided into four main stages, as outlined below:

- **Background/preparation**
- **Fieldwork**
- **Policy analysis**
- **Progress reporting**
- **Synthesis**

⁸ Though not a strictly independent reviewer, the TF is relied upon for its role as an objective participant in the project and is expected to be able to carry out this task in an unbiased manner.

Background and Preparation

Case study selection criteria: Case studies will be selected by project partners and the project Task Force based on the following criteria:

- **Representative climate-related events:** Case studies will involve past or ongoing climate-related events that are representative of projected future climate change, as outlined most recently in the IPCC TAR, as well as the Sudan First National Communications (e.g., prolonged drought). Past or ongoing climate-related events will be used as proxies for future climate extremes. Scientific records will be relied upon to establish the magnitude of the event.
- **Representative systems:** Case studies will involve circumstances that are representative of a particular productive system. Each case study will focus on an agricultural system or ecosystem and dependent communities therein that have been exposed to a climate stressor. The term “agricultural system” is used here to capture a localized system of agricultural production that is at least partly responsible for sustaining the local population. Examples of such systems might include rainfed sorghum production, gum arabic production, or rangelands-based animal husbandry.
- **SL applications:** Case studies will explore specific examples of community-level SL applications (e.g., collaborative management, soil conservation, water harvesting) that have been applied in Sudan, and could be applied in other countries.⁹ The list below represents *examples* of the types of SL measures which could be studied within the above context.¹⁰ Note that these are generally applied as packages of measures, referred to here as SL ‘strategies’¹¹:
 - *Soil Management* - This approach to increasing the stability and productivity of soil is a general term which involves a range of specific techniques such as fallow cycling, forest buffering, selective planting, managed grazing, etc. Soil management is recognized as central to combating desertification.
 - *Water harvesting* - Around the world, this approach has many variants - from the construction of johads (earthen dams) in Northwest India to rooftop collection in the Caribbean, to the forest zai in West Africa - and many champions. Water harvesting techniques have been used as a drought-proofing tool to increase water available for households, irrigation, as well as baseline water flow for watershed restoration. (In Western Sudan, for instance, the trunk of the *Adansonia digitata* tree is used for water harvesting, purification and storage.)
 - *Windbreak Construction* - As wind erosion contributes significantly to the process of desertification, a number of natural resource management methods have been applied, both through formal

⁹ As this is considered the key criteria that will be used to distinguish one case from another, the project may select the same target system twice if different measures are applied in different settings within.

¹⁰ The identification of the natural resource management approach to be studied would occur in tandem with the identification of agricultural/ecological systems (described above).

¹¹ For this reason, we do not propose to disaggregate and quantify the specific impact of individual measures, but rather (a) whether or not packages of measures increase community security and (b) what factors enable this.

desertification projects and autonomous activities of farmers, to reduce its effect. Replanting of indigenous trees and shrubs for windbreaks, as well as ridging, mulching and rock bunds, are but a few methods.¹²

- *Intercropping* - The technique of planting selected food crops within stands of trees (e.g., in the case of Sudan, gum arabic stands) is suggested to provide local communities with added food security and income through livelihood diversification, while at the same time reducing deforestation and desertification.

The many additional approaches that might be considered include collaborative management, microcatchment management, selective biomass regeneration, rangelands management, livestock diversification, gully control, and organic matter management (to name but a few).

- **Successful examples:** Case studies will explore examples of community-level SL applications that are considered successful by government and/or civil society groups, and are *confirmed* as successful by the communities themselves.¹³ As described above, selected systems will be those in which an SL approach has been previously applied - i.e., an SL technique has been used in the system by individuals or organizations seeking to increase system resilience and/or productivity. To select such systems, project partners will survey a country for sustainable livelihood/natural resource management experiences that are considered successful by communities, NGOs, government agencies, etc. and select these as our case studies (in the case of Sudan, this will involve those sets of measures that have effectively responded to community drought-proofing needs). Our researchers will then carry out field research to determine the *nature* of this success, and to determine how the SL strategy was implemented, what helped it succeed, what challenges it faced, etc.

Climate data collection: Local project coordinators will compile information on recent (last 20 years) extreme climatic events, including geographic extent, intensity, duration, etc., from e.g., WMO and FAO datasets. (Note: It may be that only major extreme (e.g., persistent regional drought) will be identified and put forth to the task force for consideration.)

Case study scoping: Local project coordinators will investigate a number of sources for information on SL strategies that have been recently applied in response to drought vulnerability and/or impacts associated with one of the above climatic events. The information collected could include:

- a) the category of practice (e.g., agriculture, conservation, water supply, etc.),
- b) the type of action (e.g., autonomous, directed),
- c) the specific action (e.g., intercropping, windbreak construction, rangelands management, water harvesting),
- d) the implementing group (e.g., government agencies, NGOs, community groups, individual farmers, etc.),

¹² See, e.g., IPCC Working Group II (2001) "Africa". Chapter 20 in the *Third Assessment Report*. IPCC.

¹³ "Success" will be confirmed through site visits and assessment of community ownership of the intervention in question, as discussed below.

- e) the intended beneficiaries (e.g., communities, nomadic groups, individual farmers),
- f) the location and duration of use.

Sources of this information may include community groups, local, regional and international NGOs, government agencies, university departments, bilateral and multilateral development agencies, etc.

Case study selection: Having met the basic criteria, case studies will then be chosen through the following basic selection process:

- **Based on information gathering outlined above, project partners will cull from a master list, a preliminary set of the most promising SL “success stories” (e.g., 10 to 12).**
- **Project partners will conduct a rapid assessment of case study feasibility, based on data needs, available documentation, location and local context, etc., and rate each candidate case study accordingly.**
- **Project partners will conduct a rapid assessment of the potential issue coverage of each candidate case study and its potential contribution to major project goals – i.e., regionally applicability, ease of use in adaptation planning, representation of vulnerable communities, etc. – and rate each candidate case study accordingly.**
 - **Based on these rankings, the top eight cases will be selected and prioritized.**
- **This list, along with a justification of selection, will be submitted to the Task Force members, each of which will independently select and justify its top four choices, and will prioritize and justify its four back-up choices. Task Force members will be asked to validate, as a group, the “success” of case studies based on the material provided, and to outline (as needed) specific information that should be gathered in the initial site visit in order to confirm this success.**
- **Based on the TF member input, the final four case studies will be selected, and four back-ups will be prioritized.**
 - **Initial site visits will be conducted by the case study researchers, to each of the four selected sites, in order to ascertain the community’s perception of the effectiveness of the SL measures. Effectiveness, or “success,” will be determined based on community feedback regarding changes in vulnerability, and on an assessment of the level of community ownership of the measures/project. Cases that are considered successful will then be expanded into**

full case studies. Back-ups will be selected (and verified) for cases that are shown to be unsuccessful.

Workplan development: The project team expects that each case study researcher will prepare a case study workplan in advance, outlining:

- (a) desk-based research on data availability, the climatic event, agricultural system, natural resource management measure, and potential resilience indicators,
- (b) preliminary selection and justification of target systems,
- (c) Groups and individuals to be interviewed/ researched,
- (d) Data collection and sampling methods to be used (government record review, questionnaires, etc.)
- (e) Travel plans, and
- (f) Budget.

Generic indicator development: (See Annex I for an outline of the project approach to indicators.) The AIACC Sudan project will attempt to develop and apply indicators of community “resilience” to explore the way in which SL projects lower a community’s vulnerability to climate-related shocks. To do so, the project is relying on several existing tools, developed for monitoring and assessing the impact of sustainable livelihoods on communities. With the guidance provided therein, the project has adopted a fairly simple approach to developing and using resilience indicators. In developing indicators of community resilience, the project is planning to use community consultation, word picture construction, and local informant validation, as outlined below.

Box 1: Quantitative versus qualitative indicators

The use of indicators to measure sustainable development, poverty reduction, ecosystem resilience, etc. is a notoriously challenging task, tending to lean too far toward either the quantitative or qualitative extremes. However, consensus is emerging in the sustainable livelihoods field that application of an appropriately balanced blend of both types of indicators can offer up realistic and informative assessments of changes in livelihood security and community resilience.¹ Both types will be combined for use with the LAST (livelihood asset status tracking) system (Bond and Mukherjee, 2002), outlined in section 5.2. This tool is essentially a quality of life index, combined with the SL framework’s use of assets.

- (a) The first step in developing resilience indicators will be for the **project team to assemble lists of generic quantitative and qualitative indicators** – i.e., those that are relevant to rural, drought-prone settings in Sudan. The project team will attempt to construct sample indicators around the five capital assets in the sustainable livelihoods framework: human, financial, natural, physical and social capital. The team will also strive for indicators that represent balance between productivity, equity and sustainability. In this way, a core set of ten to fifteen generic quantitative, ‘expert-derived’ indicators will be developed by the project team and task force, as well as a core set of qualitative indicators.

- (b) These indicators will be revised and refined for each case study by the researchers and communities in question, in order to better reflect their specific circumstances. Thus, the second step in developing indicators is for the **case study researchers** to review the generic indicators in a community forum and **to guide the community members through a process of reflection and revision, resulting in a set of locally-derived indicators**. In the initial site visit, communities will be consulted to consider the sample *qualitative* indicators and to develop their own sets (for simplicity, quantitative indicators will be revised during the second site visit and word picture construction, outlined below). As part of this process, historic events and their effect will be considered.¹⁴ Communities will be asked to use these indicators to define the net impact of the SL activity on their level of resilience to climate extremes. (In the second site visit, these indicators will be used as the basis for comparison between community vulnerability prior to the SL activity, and following the activity.) These steps are outlined further below.

Fieldwork

Case study fieldwork will be conducted through at least two and preferably three site visits. The duration of these visits will most likely be between 2 days (in the case of the initial site visit) and 5 or 6 days (in the case of the second site visit). In all, fieldwork is expected to be conducted and concluded within a 2-month period.

Major goals of the fieldwork are the following:

- Gain community trust, commitment and participation in the case study
- Confirm success of SL project
- Finalize resilience indicators
- Finalize and carry out data collection strategy
- Fill data gaps and validate findings
- Initiate policy process analysis

The anticipated fieldwork process is outlined below.

Initial site visit: The purpose of the initial site visit is four-fold: (1) to garner community trust, interest in, and support of the project and the approach, (2) to confirm the success of the SL activities from the community's perspective (and thus, justify the case study), (3) to scope and schedule subsequent fieldwork (including participatory framework), and (4) to identify and contract a local informant. Given the skill of commissioned researchers, tasks (1), (3) and (4) will likely be straightforward, though special attention will need to be paid to creating a plan for community participation that is sensitive to relevant social barriers (gender, class, ethnicity, etc.). However, the second activity

¹⁴ For example, impacts of the 1983-1984 drought, such as livestock loss, dry wells, unemployment, will be examined to tease out useful indicators of resilience.

will require a well-considered approach. Project partners recommend the following:

- CSRs should undertake the initial site visit prepared to share and discuss (a), a particular climate extreme(s), to which the community has been exposed, in order to establish the project context and objectives; (b), a set of generic, expert derived qualitative indicators (discussed below) that can help to describe aspects of people’s livelihoods that can be impacted by climate events; and (c), a process, including selection criteria, through which the community can consider and revise these indicators to better describe their context.
- For its part, the community will be asked to (a), develop criteria for indicator selection, based on a brainstorming exercise (**see Annex 3 for more information**); (b), refine and expand the set of indicators based on these criteria; and (c), informally assess the impact of the SL activities on those indicators. (At this stage, the indicators are intended to be qualitative, to allow for rapid revision and appraisal on the part of the community.) Examples of criteria relevant to a local setting are outlined in the table below.

Table 1

Cells contain locally relevant criteria reflecting the productivity, equity and sustainability dimensions of each of the five capital assets	The five capital assets				
	Natural	Physical	Financial	Human	Social
Productivity	Soil fertility	Irrigation infrastructure	Income	Employment	Education and training
Equity	Access to crop land	Access to irrigation system	Access to credit	Individual/household rights	Access to decision-making
Sustainability	Land management	Water management	Savings and investment	Health	Local institutions

- These critical steps are intended to determine whether the community views the SL activity as successful in increasing their livelihood security and thus their resilience to climate impacts. It is important that the community clearly, if informally, (a) assesses itself as better prepared to cope with and recover from climate impacts, following the SL activity, and (b) attributes causality of resilience to the SL activity. The connection need not be absolute, but the researcher must be convinced that the SL activity has played the most significant role in recent improvements in community resilience.

Following the initial site visit, CSRs will prepare a short report for project partners and task force members which outlines their findings and conclusions about the appropriateness of the particular community experience for continued case study research.

CSR action items for first site visit:

1. Identify and contract local informant (prior to field visit if possible).

First meeting:

2. Organize introductory meeting to familiarize community with the project and with the SL concepts (SL approach, 5 capitals, etc.), answer questions, consider indicators, etc.
3. Within community meeting, discuss key climate extreme to which community has been exposed in order to frame project and establish objectives.
4. Guide community through process of outlining criteria for indicator selection, based on the 5 “capitals”.
5. Using criteria, guide community through process of revising generic qualitative indicators to better represent circumstances. Result should be revised lists of qualitative indicators for each of the 5 capitals. (See Box 2 for an example of natural capital indicators.)
6. Guide community through process of choosing qualitative indicators that best describe circumstances pre- and post SL-activity, in order to confirm project success (e.g., food stores pre- and post-SL activity).
7. Schedule subsequent fieldwork – community meetings, data collection process, etc.
8. Following meeting, assess community feedback and results.
9. Prepare report outlining (a) consultation process, (b) indicator criteria, (c) revised indicator set, (d) suitability of case to further study, and (e) data collection strategy.

Second site visit: The case study researcher will have some degree of flexibility in the data collection process, since both the indicators and collection methods are to be adapted to suit each case study context. However, we anticipate that case study researchers will (a) collect datasets of a certain minimum size for an agreed set of resilience indicators, (b) document data collection, (c) perform basic data analysis, (d) summarize findings and (e) document any limitations and biases in carrying out the protocol.

Beyond these parameters, the project approach to defining resilience indicators and collecting data is as follows:

- Building on the initial site visit (in which communities were asked to select and revise generic qualitative indicators and use these to assess project success), the second site visit will focus on finalizing and using indicators to describe household circumstances, pre- and post-SL intervention, in order to define the net impact of the SL activity on their resilience to climate extremes.

Box 2: Sample indicators of natural capital (quant. and qual.)

Indicator
Land ownership/ access (# ha)
Food stores (# seasons)
Fertility of land (soil quality)
Location of land (degree of slope)
Subsistence and cash crops (amounts of each; ratio)
Fodder production (amount)
Surplus seeds (ability to trade)
Access to irrigation water (type and degree of access)
Livestock holdings (# heads)
Supplemental agricultural income (type; amount)
Household food production (dairy? fruit?)
Access to forest produce (type and degree of access)

- **Indicators:** During the initial site visit or at the start of the second, full sets of qualitative and quantitative indicators will be identified and selected, based on the established criteria. Examples of both types of indicators are provided in the adjacent box. The indicators developed will be reviewed by the community and by the local informant under the direction of the case study researcher and adapted as needed to accurately reflect local circumstances and experience.
- **Word pictures:** At the outset of the second site visit, community indicator sets will be assembled into composites of both quantitative and qualitative indicators known as ‘word pictures’ (see Bond and Mukherjee, 2002). ‘Word pictures’ are descriptions of household circumstances. The main tool of the Livelihood Asset Status Tracking system, developed by Bond and Mukherjee (2002), word pictures are essentially quality of life indices, constructed around the SL framework concepts of assets. (See **Annex 3** for more information.)
- Sets of word pictures will be developed for each of the five capitals – natural, physical, financial, human and social. For each, one word picture will outline a best-case snapshot of household circumstances, another will outline a worst-case snapshot, and roughly three word pictures will be developed to describe household circumstances in between. An example of a set of word pictures describing household access to/ownership of natural capital is provided in the table below.
- Embedded in these word pictures are both quantitative indicators (such as cash income, crop productivity, livestock populations, year-round wells, local grain reserves, employment rates, and savings) and qualitative indicators (such as access to forest produce, rangelands, and fertile soil, or access to credit, seeds, and markets).
- An example of a list of indicators and resulting word pictures developed by a community is presented in the table below.

	Worst case					2	3	4	Best case				
Indicator	0	5	10	15	20	20-40	40-60	60-80	80	85	90	95	100
Land ownership/access	little or no land								X hectares land				
Food stores	one or two month's food available from own land												
Fertility of land	red soil with low fertility								more of black fertile soil				
Location of land	land is located on slope; rain water washes away seeds and top soil								fertile land with moisture retention capacity				
Subsistence and cash crops	use of traditional seeds								grows and sells cash crops; grows vegetables; availability of home grown food throughout year; grows high yielding variety seeds				
Fodder production	no land for growing fodder												
Surplus seeds									lends seeds to others				
Access to irrigation water	no source of irrigation								irrigation facilities available round the year				

Number of livestock	owns one or two livestock				many livestock,
Supplemental agricultural income					high returns from livestock;
Supplemental food production	no milk produced				many fruit trees
Access to forest produce	low access to forest produce				access to forest produce

- Tables such as this (one for each ‘capital’) will be used by households to assess their own resilience to climate impacts. To do so, households will assemble their own word pictures (one for each capital), drawing from the gradient of indicators agreed upon by the community.
- One of the requirements of this exercise is that all community members agree on a ‘signal’ event – a climatic event that had significant negative impacts and is firmly captured in community memory. Household assessments of their circumstances during the signal event will be compared to (a) circumstances during a more recent event, or (b) where no recent event exists, circumstances during a hypothetical event.
- In the case of (a), the impact of the SL activities will actually have been tested by a climate event. In these cases, the SL measures will have taken effect prior to the onset of a recent climate event, and the community will be able to assess the *change* in their ability to cope with the climate event, and thus assess the impact of the measures on their level of resilience. In these cases, individuals and households will be asked, through surveys and interviews, to develop one word picture that best describes household circumstances during the signal event, and one that best describes circumstances during the recent event.
- In cases where the SL measures have just recently been implemented, there may be no recent climate event to use for comparison. Instead, individuals, households and the community will be led through role-playing exercises. In these exercises, people will be asked to project the historic (‘signal’) event onto the current context and to develop a word picture that best describes the household circumstances they would expect to experience if the event were to occur today.
- A hypothetical example (from Bond and Mukherjee, 2002) of worst case and best case word pictures assembled by a household during the survey process is outlined in the box below. Based on the scores established by the community in the table above, both word pictures would have an associated

Box 3: Word picture of household’s access to natural resources (natural capital)

Pre-SL activity	Post-SL activity
Little or no land; one or two month’s food available from own land; quality of land is poor, having red soil with low fertility; land is located on a slope in such a position that rain water washes away the seed sown and the top soil and hence reduces its fertility; use of traditional seeds; some have given away land as collateral; no source of irrigation; no land for growing fodder for livestock; owns one or two livestock; no milk produced; low access to forest produce;	More of black fertile soil; more land; grows one’s own fodder on one’s own land; fertile land with more moisture retention power; more produce from land; grows and sells cash crops; grows vegetables; grows high yielding variety seeds; lends seeds to others; irrigation facilities available round the year; land is near the forest; access to forest produce; some have government permit to grow opium; has many fruit trees; availability of home grown food throughout the year; many livestock, high returns from livestock;

Source: Bond and Mukherjee (2002)

score, which would be used in the analysis process.

- Word pictures, and by extension, the role of the SL activity, will be examined in community forums, household surveys and targeted interviews, and are expected to enable the project to systematically organize community perceptions of resilience.

Though not a component of the livelihood assessment itself, the policy process analysis (see section 5.3) will begin during the second site visit. During community consultations, household surveys and targeted interviews, CSRs will collect information to help determine what policies, institutions and processes (e.g., land tenure policy, local governance arrangements, market access) have enabled the SL activity – and which have inhibited.

CSRs will prepare a short report for project partners and task force members, following the second site visit, which outlines the experience, initial findings and validation needs for the next/final site visit.

CSR action items for second site visit:

1. Organize second meeting with aim of revisiting/finalizing indicators and developing ‘word pictures’.

Second meeting:

2. Guide community through process of revising generic set of quantitative indicators, using established criteria.
3. Using revised indicators, guide community through process of developing ‘word pictures’.
4. To the extent possible, develop separate sets of ‘word pictures’ to describe each of the five “capitals”:

Data collection:

5. Finalize survey content (questionnaire, interview questions) based on ‘word picture’ construction.
6. Using stratified sampling methods and local informant advice, finalize data collection strategy.
7. Distribute questionnaires and conduct surveys and targeted interviews (households, individuals, key groups) in which respondent develops ‘word picture’ that best describes household circumstances in times of drought – both prior to and following the SL intervention.
8. Prepare report outlining (a) word pictures exercise (b) data collection process, and (c) early

Third site visit (or extended second visit)

Findings generated through data collection and analysis will require validation by the community as a whole, prior to finalization of the case study. Through simple dialogue, or using participatory methods such as role playing, preliminary findings regarding the role of SL/NRM measures in building local resilience to climate impacts will be reviewed, discussed and as appropriate, adjusted. This will be a key opportunity to discuss causality and to explore caveats and biases of the inquiry.

The third visit will also provide an opportunity for CSRs to follow up on specific questions or concerns posed by the project team and task force regarding the preliminary findings.

Lastly, the third site visit will provide an additional opportunity for CSRs to conduct interviews and consultations with key local stakeholders to gather additional perspectives for inclusion in the policy process analysis (see below).

CSR action items for third site visit (or extended second visit):

1. Organize third meeting with aim of clarifying and validating preliminary findings.

Third meeting:

2. Using participatory methods, guide community through process of reviewing and discussing output of data collection process.
3. Facilitate discussion on key questions raised by project team, TF or CSR.
4. Facilitate discussion on causality and enabling factors – i.e., (a) the extent to which the SL activities in question are responsible for increased resilience and (b) the policies, institutions, etc. that supported or challenged the activity within the community.

Targeted interviews:

5. Conduct targeted interviews to explore questions of causality and enabling factors.

Policy Process Analysis

Analysis of the policy process will begin during the fieldwork stage and continue following conclusion of the fieldwork. This stage of case study development will conclude within one month of the final site visit. The purpose of the analysis is to essentially back-cast from successful sustainable livelihoods outcomes, to try to determine what factors – primarily policy and institutional factors – enabled that success.

This phase of the research will involve of a modified version of the steps presented in the "Livelihood - Policy Relationships in South Asia" Working Paper Series,¹⁵ as outlined here. In "A Methodology for Policy Process Analysis", Springate-Baginski and Soussan (2001) outlined a series of six steps. Drawing heavily upon these, but reversing their order, the AIACC Sudan project will pursue the following:

- *Determining outcomes and impacts for livelihoods:* this step is essentially the livelihood assessment process undertaken through the fieldwork described above. With an assessment of impacts on local livelihoods, the researchers will assemble a series of policy and institutional linkages through the subsequent steps. (see above)
- *Identifying key policy and institutional issues and defining their relationship to the sustainable livelihoods project:* this step will involve identification of policies and institutions (at the macro, meso and micro-scales) that are seen as important to the development, implementation and success of the SL project and carefully exploring the relationship. At the macro-scale, land tenure reform, for instance, may play a critical role in certain projects, just as lack of reform may have challenged project implementation. At the

¹⁵ <http://www.geog.leeds.ac.uk/projects/prp/downdocs.htm>

micro or meso-scale, a sound framework for participation in local governance may pave the way for robust project participation and lasting project ownership.

This step will rely largely on interviews with key stakeholders (from government, civil society, etc.), household surveys, and community consultation.

- *Exploring the policy development process:* once key enabling factors have been identified, the challenge is to explore how and why these came to be. In the present step, researchers will examine how the policies and institutions of interest were developed, seeking insights into the process such as key actors and common strategies.

This step will involve primarily interviews with key stakeholders and desk-based research.

- *Establishing a picture of the policy, institutional and process contexts:* this step is intended to clarify *why* enabling factors came to be. This series of nested pictures will describe first the micro, focused on the village or village council scale; next the meso, focused on the district or sub-national scale; and finally the macro, focused on the national or regional scale. By developing these pictures of the SL project context, the AIACC Sudan project will be able to better understand the sort of groundwork that needs to be in place in order for certain SL activities to take root.

For the micro and meso-scales, this step will involve interviews with key stakeholders, community consultation, and desk-based research. For the meso and macro scales, it will rely on interviews with key stakeholders and desk-based research.

- *Creating a history of key policy milestones:* lastly, it will be instructive to anchor the analysis emerging from the above steps to a policy and institutional heritage. By piecing together the preceding information, it will likely become apparent that certain instances of landmark legislation, reform, etc. play a direct role in enabling SL activity today. It may be valuable for climate change adaptation activity to build off of or link to these policies and processes.

This step will rely on interviews with key stakeholders and desk-based research.

The information assembled above will be developed into a policy process analysis document, which will serve as a major component in the final case study report.

Progress reporting

Researchers will provide project partners with two interim reports. The first report (5-10 pages) will follow the initial site visit. This report is intended to *confirm the suitability of the community* for case study, to outline the key community assets, describe the selection of a local informant, outline a provisional set of indicators adapted to the community context, and indicate any adjustments to the workplan.

The second report (5-10 pages) will be prepared subsequent to the primary community consultation and household interviews and will *provide preliminary analysis of the findings*. This report is intended to serve two purposes: to provide project partners with an indication of the kind of findings that the case study is yielding (to which they can provide comment, request additional information, suggest follow-up action, etc.) *and* to provide researchers with the basis of the draft case study report.

Synthesis

The synthesis phase of the case study work involves preparation of the full case study report, and will involve close collaboration of the CSRs, the project team, and the project task force. See Annex 2 for report outline. The process will proceed as follows:

- *Draft case study report:* The first draft of the case study report will be prepared by case study researchers within 2 weeks of the policy process analysis completion (1.5 months after the conclusion of fieldwork)
- *Internal review:* The first draft will then be reviewed by the project team and task force. Comments will be provided within 2 weeks of receipt.
- *Second draft case study report:* Based on this feedback, CSRs may need to conduct follow up research, verification and additional site visits in order to prepare a second draft. CSRs will submit the next draft one month after receiving feedback.
- *Final draft case study report:* Project partners will coordinate preparation of the final draft reports, soliciting and incorporating task force member input, and circulating for peer review.

Following the completion of all case studies, project partners, with task force member guidance, will develop a series of synthesis documents for publication. These will undergo several rounds of revision and extensive peer review.

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Annex 1: Glossary

Adaptation

Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. (Source: Climate Change 2001: Impacts, Adaptation, and Vulnerability)

Assets

[REVISE] Valuable resources.

Coping Capacity

The variation in climatic stimuli that a system can absorb without producing significant impacts.

Criteria

“Criteria are the intermediate points to which the information provided by indicators can be integrated and where an interpretable assessment crystallizes” (Prabhu et al. 1999).

Cross-Scale Issues

“A key benefit of examining these cross-scale interactions...identifying, analyzing and understanding the linkages across scales...is for the validation and contextualization of results; this can only be achieved with a complete understanding of these interactions.” Problems occur when translating small-scale assessments to the global realm and vice versa. If temporal and spatial factors are not taken into account, data is inaccurate. The most accurate conclusions are drawn from a set of nested assessments. (Millennium Ecosystem Assessment Methods, 2001)

Disaster

“A disaster occurs when a significant number of vulnerable people experience a hazard and suffer severe damage and/or disruption of their livelihood system in such a way that recovery is unlikely without external aid.” (Source: At Risk: Natural Hazards, People’s Vulnerability, and Disasters)

Impact

Consequences of climate change on natural and human systems. (Source: Climate Change 2001)

In the context of climate change, an impact might decreased crop production, due to lower rainfall.

Indicator

Any variable or component of the ecosystem or the management system used to infer attributes of the sustainability of the resources. (Landres 1992; Prabhu et al. 1996)

Livelihood

A livelihood is a combination of the resources used and the activities undertaken in order to live. (Source: DFID Sustainable Livelihoods Guidance Sheet, Glossary)

Multi-Criteria Analysis

“A decision-making tool developed for complex multi-criteria problems that might include qualitative and quantitative aspects of the problem in the decision-making process.” (Source: Guillermo, A. Mendoza, and Phil Macoun. Guidelines for Applying Multi-Criteria Analysis to the Assessment of Criteria and Indicators, Glossary)

Natural Resource Management

Management and supervision of natural resources including land, water, forest products, and other productive assets. (Source: At Risk: Natural Hazards, People’s Vulnerability, and Disasters)

Nested Assessment

A set of integrated assessments undertaken at various levels including all or a sub-set of the following: global, national, regional, community, household and individual. From the perspective of the Millennium Ecosystem Assessment, this would imply the following: “As full assessments in and of themselves, each of these components should examine the condition of ecosystem services, develop scenarios and responses, and engage with users, at their respective levels...[which] will directly address user needs and contribute to decision-making at those levels” (Millennium Ecosystem Assessment Methods).

Resilience

Amount of change a system can undergo without changing state. (Source: Climate Change 2001)

“Ecosystem resilience is the capacity of an ecosystem to tolerate disturbance without collapsing into a qualitatively different state that is controlled by a different set of processes. A resilient ecosystem can withstand shocks and rebuild itself when necessary. Resilience in social systems

has the added capacity of humans to anticipate and plan for the future” (Source: Resilience Alliance Website, What is Resilience?).

Sustainable Livelihoods

A livelihood is sustainable when it is capable of continuously maintaining or enhancing the current standard of living without undermining the natural resource base. It should be able to overcome and recover from stresses and shocks. (Source: DFID Glossary)

Sustainable Livelihoods Framework

The sustainable livelihoods framework is a visualization tool that has been developed to help understand livelihoods. It aims to stimulate debate and reflection, which should result in more effective poverty reduction. The framework does not attempt to provide an exact representation of reality. It is a simplification and it should be adapted for use in any given circumstance.

(Source: DFID Glossary)

Sustainable Livelihoods Strategy

A strategy of development in which people’s livelihoods are the focus of attention. (Source: DFID Glossary)

Vulnerability

“The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.” (Source: Climate Change 2001)

Annex 2: Case Study Report Outline

Each case study is intended to serve as a stand-alone report, as well as feed into the project synthesis documents.¹⁶ In order to ensure comparable case study outputs, it is important that they be presented in a uniform manner. We therefore propose that each case study researcher follow the same basic outline, presented here:

1. **Purpose** – An overview of the case study purpose and goals.
2. **Background** – A detailed and informative background section, including the following sub-sections:
 - 2.1 *The Community*: This section will tell the “story” of the case study community – Where is it located? How does it function? What resources does it rely on? What are its assets? What does it produce? In what ways has it been vulnerable to climate impacts? What are its key challenges? What are its most relevant local trends?
This sub-section will also describe what households in the community are like – how they operate, what assets they have, what their major needs are, etc.
 - 2.2 *The Policies, Institutions and Processes*: this section is intended to embed the discussion of the community in the larger socioeconomic context by sketching the micro-, meso- and macro-scale policies, institutions and processes that are of greatest relevance to and have the greatest impact on the community in question. For example, this section might discuss local systems of governance, regional market access, and national land tenure and land management policies.
 - 2.3 *The Climate Context*: This section will place the community in the climate context, providing an overview of local historic climate patterns, highlighting major climatic events, and discussing key instances of serious climate impacts. This section should outline, in particular, any climatic events that will be used in the assessment of community resilience.
 - 2.4 *The SL activity*: In this detailed section, the researchers will introduce the sustainable livelihoods intervention (i.e., the resilience-building measures implemented within the community) to be examined through the case study. Relevant information will include:
 - key actors (NGOs, community groups, local institutions of governance);
 - a discussion of each of the specific measures involved (e.g., dune stabilization, composting, water harvesting, revolving credit schemes, etc.);
 - the process by which the measures were implemented (e.g., community consultation, collaborative planning, self-monitoring, etc.);
 - a preliminary assessment of success (i.e., an overview of the community assessment process through which criteria were used to determine the success of the measures/strategy in question, as well as a summary of the assessment results).
3. **Methodology** – This section will provide a complete overview of the methods used for the case study, including an in-depth discussion of any variation from the standard project methods. The section will include sub-sections on
 - 3.1 research methods used,
 - 3.2 the community consultation, survey and interview processes,
 - 3.3 indicators developed (including word pictures),
 - 3.4 the validation process,
 - 3.5 as well as any limitations, caveats or biases encountered.
4. **Community Resilience Profile** – This section will:
 - 4.1 outline the data collected on changes in household and community resilience,
 - 4.2 summarize the changes in resilience to climate impacts following the SL intervention,
 - 4.3 discuss the validation of the findings within the community.
5. **Analysis** – In this section, researchers will provide discussion of the factors (e.g., local governance conditions, local NGOs, national economic policies) that enabled the SL

¹⁶ Project partners intend to compile the individual case study reports into a single volume, which would include a description of the overarching study goals, approach, methodology and results. Case studies would also be used as the basis of the project synthesis documents, which are intended to provide relevant material to a range of potential audiences.

activity to take effect and have a positive impact on the communities. Specifically, researchers will provide an analysis of:

- 5.1 the role of the SL intervention in building community resilience (including the implementation strategy, the groups involved, the specific measures employed, etc.),
- 5.2 the role of the micro-scale policies, institutions and processes (from policy process analysis),
- 5.3 the role of the meso-scale policies, institutions and processes (from policy process analysis),
- 5.4 the role of the macro-scale policies, institutions and processes (from policy process analysis),

6. **Lessons learned** – As the name implies, concise lessons that can be gleaned from the analysis above will be summarized in this section.

7. **Conclusions** – This section, to be drafted with input from project partners, will outline the implications of these findings for the various relevant policy processes – and in particular, the adaptation policy process.

Annex 3: Overview of LAST System

The following text has been excerpted from Bond and Mukherjee (2002): *Livelihood Asset Status Tracking (LAST): A Case From Rajasthan*

1. The Project

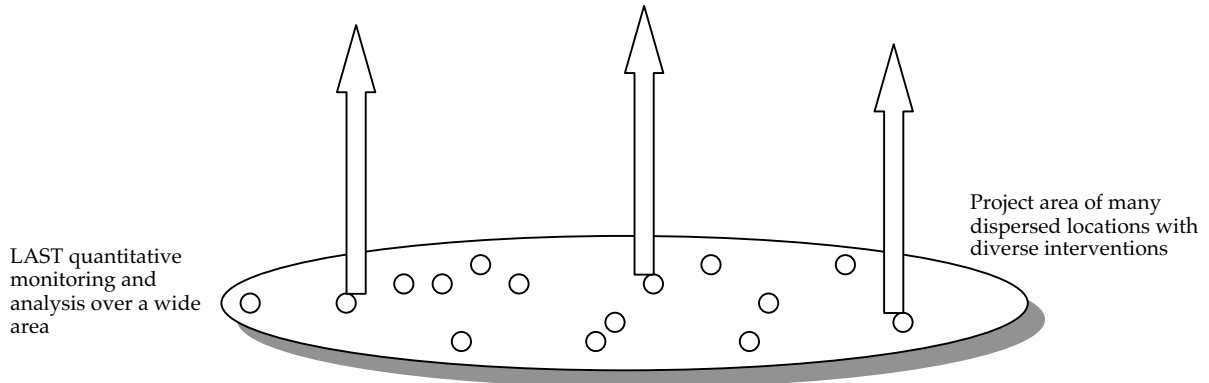
The project is that part of the DfID supported Western India Rainfed Farming Project (WIRFP) Phase 2 managed by the Indian Farm Forestry Development Cooperative Ltd (IFFDC) in Pratapgarh in the Chittorgarh District of Rajasthan. The area is remote, hilly and drought prone with an annual rainfall of some 800mm and has experienced considerable land degradation.

The £2.3m DfID support to the IFFDC component of this £28m project started in May 1999 for a period of seven years and operates initially in 25 core villages. There are plans to expand to 75 core villages and through a further 150 dissemination villages to a population of some 150,000 poor people. It aims to enhance the livelihoods of the predominantly tribal population through farmer groups, participatory village planning, improved farming systems, group savings and income generating activity. The project operates as a participatory process from an autonomous PMU and works with village specialists (Jankars). Some experience from the use of this method in research in Uganda and South Africa under DfID project R7076CA is incorporated (Howlett et. al. 2000).

2. The Issue Addressed

[...] Impact attributable to particular interventions is notoriously difficult to establish, and as such requires very thorough and careful assessment. This is not the usual function of monitoring, which is concerned with timely detection of changes within the area of management responsibility. A solution to this dilemma, illustrated below, may be to combine these monitoring and evaluative functions in a cost-effective way. This would require monitoring for any changes in livelihoods within the areas of intervention and selectively investigating interesting changes with ad hoc learning exercises (ALEX) in order to understand causes and effects of the changes. A variety of both formal and participatory methods exist for the ALEX part, the remaining problem is to find a suitable method for rapid identification of change in livelihoods over wide areas which is logistically feasible and managerially relevant. Such a system was developed between April and September 2000 by IFFDC.

Qualitative ALEX carried out where monitored change is of managerial interest.



3. Sources and Ideas Used

This section briefly introduces the various ideas and sources used in the LAST method.

3.1 Sustainable Rural Livelihoods (SRL) Framework

This positive framework approaches poverty from the perception of the poor considering the assets to which they have access and the strategies they employ for survival (DfID 2000). These assets are considered to be the five 'capitals' of natural, physical, human, financial and social. Livelihood strategies are usually associated with production but the framework also considers access to the capitals (equity), and trends and shocks (sustainability).

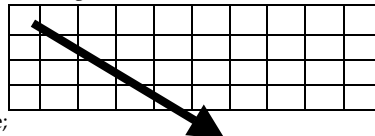
3.2 Quality of Life Indexes

Over the last decade some NGOs¹⁷ have assessed quality of life using combined indexes based on locally derived perceptions of selected indicators ranged in locally recognisable stages from 'worst to best'. These generally take the form;

Cells contain 'word pictures' of each stage for each criteria described in local terms.

Scored stages from worst to best situation known locally (left to right) usually to set number of stages (often ten).

Criteria for assessing quality of life e.g. Housing, Education, Health, Income. One per row.



The advantages of this method include;

1. Rapid assessment of households by observation and questioning.

¹⁷ Used for example by microfinance NGOs 'The Bridge Foundation' in Bangalore and Maha Bhoga Marga in Bali, Indonesia (Bond & Hulme 1992).

2. Conversion of qualitative assessment directly to quantitative score.
3. Locally meaningful assessment.
4. Consistent method for assessments within area and over time.
5. Disadvantages include;
6. Lack of theoretical framework as basis for criteria used.
7. Fixed number of stages is artificial.

The combination of this method with the SRL framework forms the basis of LAST. [...]

3.3 Process Approaches

A process approach to a project is commonly associated with participatory approaches but is more than that (Bond & Hulme 1999). The concept also includes high levels of managerial flexibility and longer intervention periods (Rondinelli 1993); it includes involvement and capacity building of local institutions, local autonomy of action and the fostering of innovation within organisational cultures of 'new professionalism' (Chambers 1993). Finally, and above all for our purposes, a process approach depends on a capacity for ongoing learning so that problems can be effectively solved and efficiently dealt with on an expanding scale of operation (Korten 1980). The LAST method has been developed as part of an integrated Process Evaluation Management Information System (PREMIS) to support the ongoing learning of IFFDC's project.

3.4 Optimal Ignorance & Appropriate Imprecision

These are actually principles of PRA (Chambers 1993) but are emphasised here to explain the deliberate avoidance of collecting certain types of information that do not contribute to useful management learning and also the use of approximate data when that yields adequate information. These principles are employed to save time and to focus attention on what is important.

3.5 Qualitative and Quantitative Methodology

Different professional groups aligning themselves with one or other approach make much of this dichotomy. However, most quantitative information is qualitative at source (Moris & Copestake 1993) and in the LAST method both qualitative and quantitative methods are combined to achieve a balance of analytical and managerial requirements.

4. The Livelihood Asset Status Tracking (LAST) System

4.1 Definition

"A rapid impact monitoring system designed along with primary stakeholders and based on the Sustainable Rural Livelihoods conceptual framework. It is intended to track the ongoing dynamics of five capital assets essential to household livelihoods as a proxy for impact".

4.2 Overview

Within the Sustainable Rural Livelihoods framework, the starting point is the assets to which rural people have access in order to devise their livelihood strategies. This is also the end point of the model as those strategies impact not only on their livelihoods in terms of outcomes (a more traditional source of indicators) but also back on the assets themselves. The changing asset base, measured in the five capitals to which a household has access can be a useful proxy for impact on livelihoods. If indicators are derived in a participatory way, they will be locally relevant within relatively homogeneous areas (in terms of ethnicity and agro-climatic criteria). Also, if the system is to be used over many households with a reasonable frequency the method needs to be quick and simple enough for rapid enumeration with reasonable accuracy. For managerial purposes in a process project, the tracking of asset status will give useful measures of change towards project purpose and will contribute to longer-term evaluations.

4.3 Methodology

Participatory workshops conducted with the project team and beneficiaries are the main vehicle for evolving LAST. The process involves small group discussions, brain-storming and clustering of criteria, field testing and validation. The main objective is to evolve 'word pictures' for LAST. The 'word picture' is a method for constructing verbal descriptions of asset status. Such word pictures can depict 'worst off' and 'better off' households and also intermediate positions. To measure asset status for each of the five capitals available to a household a locally meaningful scale of stages is described from the worst known situation to the best, the number of stages is not important (typically 3-6) but their reality and recognisability is. The descriptions will have to maintain a balance between aspects related to production, equity and sustainability to avoid distortion of the development perspective used in the matrix. For example, a high score under natural capital for fertile farmland (productivity) would be misleading if that land is on a steep slope and will soon erode (sustainability).

A hypothetical illustration, which was used during the initial workshop held at IFFDC project is given below. The illustration covers two word pictures of 'worst' off and better off households.

Word Picture of Household's Access/ownership of Natural Resources

Worst Picture	Best Picture
Little or no land; one or two month's food available from own land; quality of land is poor, having red soil with low fertility; land is located on a slope in such a position that rain water washes away the seed sown and the top soil and hence reduces its fertility; use of traditional seeds; some have given away land as collateral; no source of irrigation; no land for growing fodder for livestock; owns one or two livestock; no milk produced; low access to forest produce;	More of black fertile soil; more land; grows one's own fodder on one's own land; fertile land with more moisture retention power; more produce from land; grows and sells cash crops; grows vegetables; grows high yielding variety seeds; lends seeds to others; irrigation facilities available round the year; land is near the forest; access to forest produce; some have government permit to grow opium; has many fruit trees; availability of home grown food throughout the year; many livestock, high returns from livestock;

NB: Only two 'word pictures' have been described here.

When such word pictures are based on the worldview of local communities, they are practical and realistic and also help in community ownership of the method. Word pictures evolved separately by women and men groups' help in focusing on gender issues.

In use the assessment sheet is compared to the reality of the particular household and a rapid assessment is made of which description or collection of indicators fits closest. Individual questions do not have to be asked for every indicator, rather judgement is used on the relevant part of the scale combining direct observation and semi-structured questioning till the enumerator is confident to identify the closest 'stage' for that household. This can be scored proportionally against

a centile scale, scores for centres of boxes being used as well as scores for edges of boxes where a household is judged to fall between two stages. Scores for the five capitals are made separately but the five can be combined (straight or weighted) to give a LAST index for the household.

The enumeration will typically take around 20 minutes for all five capitals. The LAST sheet is used only as a checklist and for marking the closest situation to the household and so need not be intrusive on the interview. Enumeration is done on a 'repeat panel' sample which can be initially selected randomly and stratified by wealth ranking or similar rapid assessment exercise to ensure a good spread of livelihoods. Detectable changes are unlikely to occur in the short-term but a reasonably frequent period of assessment is needed to inform management. The ideal assessment frequency is likely to be between 3 months (IFFDC) and a year.

Precision tests can be conducted on the scoring with a newly developed LAST sheet using three enumerators present simultaneously during assessment but not collaborating, with one asking the questions. Scores can then be compared to gauge reliability of the method in terms of precision.

4.4 Process

At least two workshops are required to be held for LAST –one for developing the system and field testing and the other for refining or fine tuning it. Both workshops are based on active participation of project team and beneficiaries where group-work, field work and shared-learning are encouraged.

The first workshop starts with introduction of the SRL conceptual framework and its different components to key informants at local level and the project team. The five capitals for livelihood are explained with the processes, structures, strategies, outcome and vulnerability aspects. Once the livelihood systems are explained and discussed the local words and descriptions are brainstormed by small groups and presented back to the plenary. This results in a checklist in which, people's livelihood activities and criteria are mapped and resources associated with such activities are identified. Subsequently, the three aspects of the capital on which livelihoods are based, (productivity, equity and sustainability) are introduced and indigenised with the help of local words. This is followed by small group brainstorming on generation of criteria related to the five types of resources for livelihood and clustering them on the basis of three categories –'productivity', 'equity' and 'sustainability'. This serves not only as a 'warm-up' to the concepts employed but also provides a balanced range of criteria from which to consider practical local indicators which may be incorporated in the 'word pictures' constructed for the stages of the LAST assessment sheet.

Cells contain locally relevant criteria reflecting the productivity, equity and sustainability dimensions of each of the five capital assets	The five capital assets				
	Productivity				
	Equity				
	Sustainability				

The criteria which appear to be locally assessable in practical and meaningful ways are then combined into a sequence of balanced word pictures representing a number of realistic stages from worst known situation to best within the area. These may be concise descriptions or a collection of indicators typical of each stage.

Based on the criteria for each capital in the matrix above, a range of 'word pictures' are constructed for the Livelihood Asset Status Matrix. The worst situation, best situation and intermediary situations are compiled for each capital. Once the LAS matrix is constructed it is tested under field conditions by enumerators working in groups of three. This is followed by the results of the LAS matrix being reflected upon by the enumerators and also reviewed by peer group/s.

4.5 Some Technical Points

- ❖ **Scale Range;** the avoidance of absolute values by scaling from 0% worst to 100% best is an already established technique in, for example, the UNDP Human Development Index (UNDP 1990). The issue of permanence of those parameters is valid, especially in a project that assumes improvements in livelihoods. However, it is unlikely that the top end will need adjustment in poverty alleviation projects particularly in areas of existing inequality. A successful project of this kind would probably only shift the proportion of households with low scores to higher scores without requiring extension of the top categories.
- ❖ **Scoring;** this is partly an issue of matching score intervals to the precision of judgement possible with this method, but is also an issue of preference of the enumerators. Solutions seem to be;
 - Marking the nearest column (steps of about 10-15%, probably too coarse).
 - Marking the nearest column or edge between columns (steps of about 5-7% a good fit with precision tests).
 - Marking the best judgement against a centile scale along the top of the matrix (steps about 5%, good fit with precision test and not tied to central / edge values of cells).
- ❖ **Range of 'word picture';** The word pictures need not be discrete and can be over-lapping to some extent. This is because they are qualitative, composite pictures graded in degrees.

5. Results

The LAST system was developed during 4 days of workshops and field testing for precision. There followed a more substantial field trial at a later date and a further one day workshop to reflect and refine the method. Project staff are comfortable and confident with the method and consider that project Jankars will be able to carry out future periodic assessments after the experience of working jointly with project Community Organisers. The project is now (December 2000) ready to conduct the first project-wide assessment. There follows an edited translation from one of the five capitals used in the IFFDC Pratapgarh LAST matrix:

Financial Capital

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

Wages labour / migration	Does labour work round the year / bonded labour; gets employment for only 5-10 days / month	Does labour work for 8-10 months / gets employment for 15 days / month	Does labour work 5-6 months/ gets employment for 20 days / month	Does labour work 2-3 months/ gets employment for 25 days / month	May do labour work for 1-2 months in a year; get it when they require it.	No need for them to do wage labour, rather they hire others
Debt/ Loan	No one gives them loan	Have to necessarily mortgage land for loan	Gets loan with great difficulty; witness of 5-10 persons; at 60% interest p.a.	Gets loan with some difficulty; witness of 2-4 persons; at 60-36% interest p.a.	Gets loan easily; at 36% interest p.a.	No need for loan or debt for them rather give loan to others
Bank/ Financial institution	No linkage; not even a bank account	No linkage; not even a bank account	No linkage; not even a bank account	No bank account; Can get small loan	Can get large loan; take advantage of bank schemes	Easy loans / bank account; takes good advantage of bank schemes
Agriculture Produce	Food grains not sufficient even for one month	Food grains sufficient for 2-3 month / sells food grain in the village.	Food grains sufficient for 4-5 month/ sells food grain in village or local fair	Food grains sufficient for 6-8 month/ sells food grain at Suhagpura	Food grains sufficient for 8-10 month/ sells food grain at Suhagpura	Food grains sufficient for 12 month/ sells food grain at Pratapgarh Mandi
Allied sources of income	No knowledge	Only agriculture & wage labour	Agriculture, wage labour & some livestock based income generating activities	Agriculture, wage labour & more livestock based IGAs	Good agriculture, good livestock and vegetable & fruit cultivation	Hires out tractor / thresher, loans seeds & takes double in return; share water cropping; Owns flour mill / shop; sells milk / ghee
Saving	No knowledge	No knowledge	Knowledge but do not practice	Saves some money	Saves Money	More savings
Jewellery	No jewellery	No jewellery	Some silver jewellery	More silver jewellery (medium sized Kade & Hasli)	Plenty silver jewellery (Heavy sized Kade & Hasli)	Owns Jewellery of both Silver & Gold

NB one score would be given for each capital, guided by the column closest to their situation or the central value of a scatter of indicators.

6. Key Points for Best Practice

- Ensure the project is of the kind where impact is likely to emerge during the period of implementation; has objectives focused on livelihood improvement; is of a process nature where management can respond to unexpected changes; has a learning oriented culture; has a capacity to carry out ALEX; and is able to elicit the participation of beneficiaries in LAST development. Otherwise this is the wrong method.
- LAST systems need to be developed separately for 'areas' of reasonable homogeneity in terms of cultural, economic and agro-ecological practice.
- The SRL framework should be thoroughly understood by all staff and participating beneficiaries before the LAST is developed.
- A LAST system development workshop should include a balance of beneficiaries, field-level staff and technical specialists with good gender balance. Special efforts are required to hear the voices of beneficiaries and women.
- Bringing local words into the conceptual framework of sustainable rural livelihoods helps in localising LAST.
- Field test a newly developed LAST sheet with precision test and discuss the results.
- Conduct enumerations in either neutral seasons or both seasons of plenty and scarcity to eliminate any possible seasonal variation.
- Have clearly established norms for enumeration backed by training and periodic 'calibration' tests.
- Validate a sample of the panel surveyed at inception and perhaps during mid-term and ex-post evaluations of the project with an in-depth household poverty assessment.
- Plot the results over time as graphs at different levels of aggregation and dis-aggregated by capitals for effective analysis.

Annex 4 : Overview of the Sustainable Livelihoods Approach

The following text has been excerpted from Goldman et al. (2000): *Institutional Support for Sustainable Rural Livelihoods in Southern Africa : Framework and Methodology*. Natural Resource Perspectives: Number 49.

Understanding the SL framework

Sustainable livelihood approaches are being used as an 'optic' through which poverty can be better understood, and development options prioritised. The version used by the Department for International Development (DFID) is outlined in Carney (ed) (1998). A livelihood is defined as 'the capabilities, assets (including both material and social resources), and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base' (Carney (ed), 1998:4).

Using the concept of assets and vulnerabilities

Rural people not only have needs but also resources or assets. Recognising this provides a respectful and positive framework for interacting with them. The five types of assets in this model are natural, social capital, human, physical and financial. Rural people are vulnerable to a range of challenges and reducing vulnerability may be a higher priority than say, increasing production, or the quantity of their assets.

Livelihood outcomes

Rural people have their own aspirations. It is important that government or programmes do not impose outcomes, but negotiate with communities to find out what their aspirations are, and what may be achievable outcomes, combining people's assets and access to resources with the external resources that government and other agencies may be able to provide. Participatory appraisals can provide tools for finding out what their desired outcomes are, in terms of increased assets, or reduced vulnerability, or such higher order concerns such as self-esteem or 'voice'.

Institutional structures and processes

A variety of organisations provide services and support to rural people, and operate within a set of laws, policies and procedures. These define the options that are available. Depending on this institutional environment, the outcomes desired and the context of vulnerability, people then select livelihood strategies.

Livelihood strategies

The key strategies in rural areas can be categorised as NR-based, non-NR-based or migration. Development initiatives can empower people by broadening the range of strategy options. One critical area is that of diversifying livelihood choices, which also reduces vulnerability.

Implications

Some of the features of the approach are that:

- It starts with (poor) people as the focus, and so puts clients at the centre. This means that client-focused, participatory, and responsive approaches are needed.
- It recognises the holistic nature of people's lives, their use of multiple livelihood strategies, and so the need for responses which are not limited by sectoral boundaries.
- It builds on positives – a respectful approach to rural people is, strengths and opportunities and not just needs.
- It recognises the differences within rural communities, and implies the need for a range of responses.
- It recognises the importance of institutional structures and processes which determine access to assets and their value and so the attractiveness of different livelihood strategies.
- It implies the need for bottom-up participatory work as well as top-down strategic work.
- It implies a partnership approach among state, community and private sector – with the role of the state as facilitator, animator, or provider.
- It recognises the need to listen to those with whom we are working and learn about their objectives, but that there needs to be a dialogue about short versus long-term objectives, e.g. on the environment, where people may sacrifice long-term sustainability for short-term gain.
- It recognises that rural and urban areas are intimately connected, and that policy and service linkages need to be examined, rather than seen in isolation.