Integrating Livelihood Issues in Natural Resource Management through Farming Systems Approach

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Sustainable livelihoods

The idea of sustainable livelihoods began as an approach to maintain or enhance resource productivity, secure ownership of and access to assets, resources and income-earning activities as well as to ensure adequate stocks and flows of food and cash to meet basic needs.

Conceptually, livelihoods connote the activities, entitlements and assets by which people make a living. In particular, the asset dimension is critical to an appreciation of the concept. Assets, in this particular context, are defined as not only natural/biological (i.e., land, water, common-property resources, flora, fauna), but also social (i.e., community, family, social networks), economic (i.e., jobs, savings, credit) political (i.e., participation, empowerment), human (i.e., education, labour, health, nutrition), and physical (i.e., roads, markets, clinics, schools, bridges). The access to, use of, and interaction among these assets serves as the foundation of a livelihood system.

One of the ways to understand livelihood systems is to analyze the coping and adaptive strategies pursued by individuals and communities as a response to external shocks and stresses such as drought, civil strife and policy failures. There is, however, an important distinction between *coping* and *adaptive* strategies. Coping strategies are often a *short-term* response to a specific shock such as drought. Actions could include switching to cultivation of drought-resistant crops or reliance on external food aid. Adaptive strategies, on the other hand, entail a long-term change in *behaviour patterns* as a result of a shock or stress.

As such, adaptive strategies move go beyond the immediate impetus for *survival*, but rather are part of a broader household decision-making process. A common example is that of agro-pastoralists who have adapted to changing conditions of climate, water, land tenure arrangements and vegetation variability by optimizing the mix of cattle, sheep, goats and camels in their herds. An notable corollary to the understanding of adaptive and coping strategies are the relational differences between women and men, whether it be distribution and control of income or access to assets and entitlements.

It follows then, that women and men are likely to play different roles in the formulation and implementation of a significant number of coping and adaptive strategies. What is important, therefore, is to explicitly recognize the *gendered* contributions to overall household well being (however defined) as well as the distinct and heterogeneous adaptive and coping strategies that are pursued at an intra-household level.

A last component to the livelihoods equation is the sustainability issue. The sustainability of livelihood strategies (as embodied by adaptive behaviour) is a function of how men and women utilize their asset portfolios on both a short and long-term basis. Sustainability is defined in a broad manner and implies:

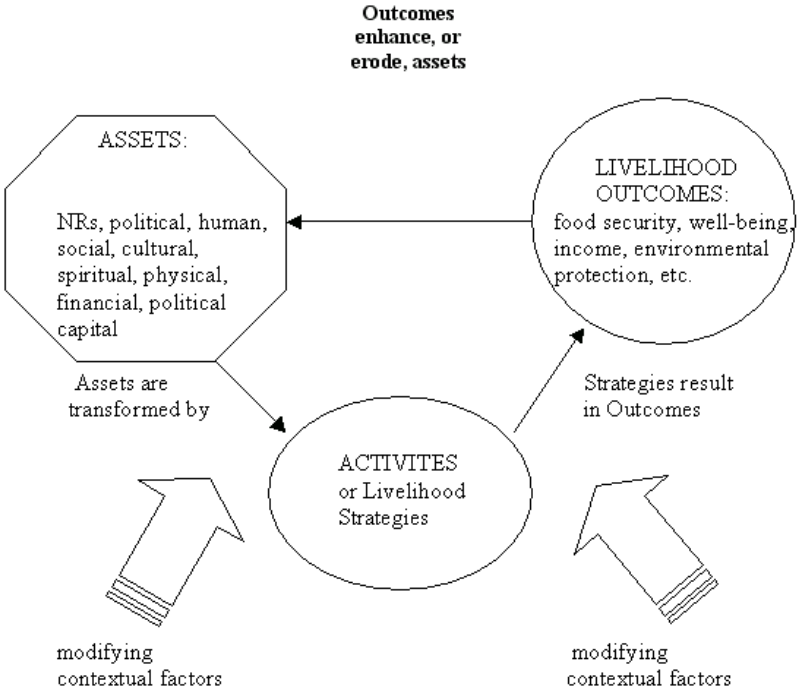
- The ability to cope with and recover from shocks and stresses;
- Economic efficiency, or the use of minimal inputs (or assets) to generate a given amount of outputs;
- Ecological integrity, ensuring that livelihood activities do not irreversibly degrade natural resources within a given ecosystem; and
- Social equity that suggests that livelihood opportunities are equally distributed at both the intra-household and inter-household level.

In other words, SL is the ability for people to make a living and improve their quality of life without jeopardizing the livelihood options of others, either now or in the future.

The transition from theory to the practice of SL is, by no means, an easy task. A number of organizations such as the International Institute for Sustainable Development, the Institute of Development Studies (Sussex), Development Alternatives, and UNDP have attempted to develop a methodology (or approach) for the design, implementation and evaluation of SL programmes at the country level. Taking the example of UNDP, a SL approach consists of a five-step process described briefly below:

- A participatory assessment of the risks, assets, indigenous knowledge base, and coping and adaptive strategies of communities and individuals;
- Analysis of the macro, micro and sectoral policies that influence people's livelihood strategies.
- Assessment and determination of the potential contributions of modern science and technology that complement indigenous knowledge systems in order to improve livelihoods;
- Identification of social and economic investment mechanisms (i.e., microfinance, expenditures on health and education) that help or hinder existing livelihood strategies; and
- Making sure that the first four stages are integrated and interactive in real time.

A Generic Livelihood Framework



The SRL framework starts with an assessment of people's strength and opportunities by focusing on the assets available to them. Accordingly five different types of assets can be listed as below:

1. **Natural Capital**: The natural resource stocks from which resource flows useful for livelihoods are derived, e.g. land, water, wildlife, bio-diversity, environmental resources. Land, water, and forests (in terms of quantity, quality, and access to them) are the most important natural resources used by farmers.

2. **Social Capital**: The social resources (networks, membership of groups, relationships of trust, access to wider institutions of society) upon which people draw in pursuit of livelihoods. Social networks , in particuar CBOs (community based organizations), self-help groups, thrift and credit groups etc. play an important role in natural resources management.

3. **Human Capital**: The skills, knowledge, ability to labour and good health important to the ability to pursue different livelihood strategies. Farmers have a range of skills and experience that enable them to produce dryland crops, as well as utilize CPRs as part of their livelihood strategy.

4. **Physical Capital**: The basic infrastructure (transport, shelter, water, energy and communications) and the production equipment and means which enable people to pursue different livelihood strategies. For rural people, such capital consists i.a. of roads, pumps for groundwater extraction, power supply, agricultural implements, etc.

5. **Financial Capital**: The financial resources which are available to people (whether savings, supplies of credit, regular remittances, or pensions) and which provide them with different livelihood options. Savings and credit are crucial for people's livelihood strategies, because they determine their options.

Farmers use these assets in their livelihood strategy to achieve livelihood outcomes. These outcomes vary from household to household, or even within a household. While a woman might aim at having enough food to feed her children, a man might aim at saving enough money to purchase a radio or a bicycle.

Poor households survive by engaging in a mix of livelihood strategies intended to increase their stock of assets (accumulation strategies); to spread risk through adjustment and diversification (adaptive strategies), to reduce the cost and their vulnerability to trends and shocks (coping strategies) and *in extremis*, to prevent destitution and death (survival strategies). Livelihood strategies can thus be characterized in terms of:

- Accumulation strategies (e.g.profitable enterprises)
- Adaptive strategies (risk-spreading diversification)
- Coping strategies (non-erosive dis-accumulation)
- Survival strategies (erosive dis-accumulation)

The livelihood strategy used by an individual or a household is determined by the assets, the desired livelihood outcome, and a range of external factors summarized in the framework as "transforming structures and processes". These include the vulnerability context (trends, shocks and local cultural practices which affect livelihoods), the structures (organizations, government institutions, private sector, etc.) and the processes (policies, laws, incentives) which define people's livelihood options. CPR utilization strategies of farmers are part of their overall livelihood strategies and are, like all livelihood strategies, dependent on the asset base and external factors generally beyond the control of the individual. Such contextual influences and determinants may take the form of:

- **Exogenous** environmental and economic influences (e.g. drought or globalisation) which are beyond the control of the state.
- Endogenous formal institutions, policies, and processes and their effects (e.g. state and public policy, property rights, markets and official prices, decentralization, population growth)
- Endogenous **informal** institutions and their effects (e.g. relations, the influence of culture, caste, conventions, ideologies)

These factors may have a very direct and different effect on the micro-level (individual men, individual women, households) and meso-level (e.g. village, district) workings of the **assets-activities-outcomes** relationship. For example, changes can affect.

- Quality and quantity of assets (e.g. disease reduces human capital, education increases human capital, soil degradation reduces natural capital, devaluation reduces financial capital)
- Activities and the terms on which they transform assets (e.g. drought leads to coping activities which may transform productive assets into liquid assets and thus denude the asset base)
- The relationship between activities and consumption outcomes (e.g. the influence of different types of prices such as minimum wage rates, income taxes, which may set a type of floor for the revenue derived from labour activities to consumption outcomes, or price stabilization policy which may affect the rate at which agricultural output increases are related to consumption outcomes).

Assets, as mentioned earlier, are the stocks of resources that available to households that are used to pursue a combination of livelihood strategies. The access to, use of, and interaction among assets serves as the foundation of people's adaptive strategies and, therefore, their *livelihood systems*. The linkages between poverty and the environment offers an illustration of how assets are used as the basis for adaptive strategies. The framework for asset analysis can be presented in the following manner:

- The categories of assets available to the poor;
- Household and village behaviour pertinent to poverty-environment links (i.e., adaptive strategies);
- Specific asset categories that are used (i.e., natural, social, human, etc.); and
- Conditioning variables (i.e., market conditions, technologies, institutions, prices).

A household starts with a set of livelihood goals or objectives. To meet these goals, members of the household have access (not necessarily equal) to a set of asset categories that are utilized to achieve the said objectives. The household is also faced with a set of external conditioning factors (i.e., shocks and stresses) which can both strengthen livelihood strategies as well place constraints on potential

actions. The pursuit of specific strategies has consequences that may reconfigure asset composition, resulting in a transformed asset base from which to begin the cycle again.

Let us look at a hypothetical (albeit based on previous experience) example in rural areas. Livelihood diversification into the non-farm sector, such as migration or participation in public works programmes, can take pressure off fragile lands and increase household incomes. Income earnings emanating from these secondary livelihoods can, theoretically, be used to finance on-farm soil conservation investments and the use of fertility-enhancing inputs. On the other hand, the regeneration of natural resources may not be a priority for certain households, with additional cash going towards purchase of additional food or payment of school fees.

Therefore, one could say that non-farm livelihood patterns use human (i.e., labour) and economic (i.e., rural employment) assets as a means to *further improve* their financial/economic asset base (i.e., income, savings, investment) as well as other dimensions of their existing stock of human assets (i.e., health, education). The impetus (i.e., shock, stress) for such a strategy could range from crop failure, lack of access to land, or the existence of public works programmes.

The challenge for the practitioner is to assemble the right participatory tools that can then be used to map community assets and understand how these assets are used in livelihood systems. Fortunately, the tools already exist and do not need to be invented. What differs, however, are the types of questions that, when asked, can elicit the information needed for a livelihood programme. This is especially important when it comes to differentiating between the strategies pursued by women and men. On the whole, women's access to assets such as land, off-farm employment, education, extension services and credit may not be on par with men. On the other hand, some traditional socio-cultural systems (especially in Africa) are matriarchal and give preference and access to these assets. Use of participatory tools should highlight these differences not as a means to create mutually exclusive categories, but to illustrate the intra-household dynamics that provide the foundation for livelihood systems.

Participatory Tools for Asset and Livelihood Analysis

One of the ways we can begin to identify the variety of assets available to communities and households is to use existing PRA tools that attempt to determine the different sources of income available to the household. While a narrow starting point, discussion of income sources helps pave the way to identification of other types of assets. These sources can be categorized in the following manner:

- Farm income: crop cultivation, livestock;
- Off-farm income: exchange labour (i.e., casual labour, seasonal labour), common property resources;
- Non-farm wage employment (i.e., public works programmes);
- Self-employment (i.e., vehicle repair, taxi services); and
- Urban-rural remittances.

Several PRA tools can be of assistance in gathering information that both identifies the income sources available to households in a particular community as well as the non-economic assets which supplement income and contribute to an overall livelihood portfolio. These include:

- Village resource maps;
- Household maps;
- Seasonal calendars;

- Focus group discussions;
- Household surveys;
- Transect walks; and
- Key informant and semi-structured interviews.

The manner in which these tools are used is similar to a normal PRA exercise (i.e., team formation, involvement of women in discussion groups, etc.). A key difference, however, is for the facilitator to keep in mind the different asset categories when using specific tools. For example ***village resource maps*** are very helpful in identifying natural assets that belong both to communities and households. Such assets would include:

- Land
- Common property resources

In terms of non-farm, or self-employment, ***seasonal calendars and daily activity charts*** help map out labour patterns and use of time. Seasonal calendars and daily activity charts should be gender disaggregated. In order to see how seasonal labour patterns contribute to livelihood strategies, trends should be identified. For example, ***how long has migration been an important source of income***? Who is responsible for major daily tasks? These findings should complement village resource mapping to then identify which asset categories are being used (i.e., human, physical, natural).

- Rivers
- Dambos/Dimbas (naturally occurring wetlands in Southern Africa)
- Forests and Forest products

These resource maps can then be complemented with ***key informant interviews***, ***semi-structured household interviews***, or ***focus group discussions*** to ascertain how these natural/biological assets are being used and what, if any, income is being derived from their use.

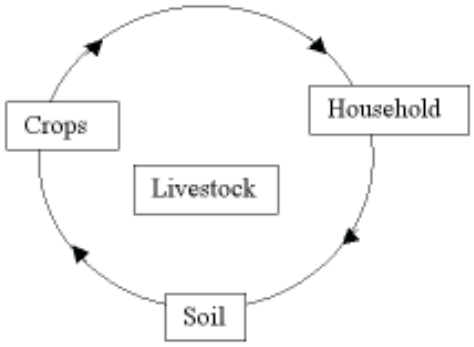
Cases for Livelihood Analysis

Case 1: **Salisu**

Constraints: (1) weak link with livestock; (2) labour exported from farming

Salisu owns five small, widely dispersed fields, comprising 0.66 ha in total. On these he grows sorghum, millet and cowpeas and supports his wife and himself. Even with manuring, his cereal grain yields average only 883kg/ha/yr. He has very few small ruminants (<0.5 tropical livestock units, TLU) and a few hens, generating essential manure. He does not have any draught animals (oxen or donkeys), and therefore he carries his manure, harvest and crop residues to and from his fields by head-loading. Owing to the distance of some of his fields from his home, the closest fields receive more inputs than distant ones. Without draught animals, he finds it too time-consuming to transport crop residues (fodder) from his fields to his home for storage, which therefore limits his ability to keep animals during the cropping season, when free grazing is not available. Owing to the low productivity of his landholding, he is obliged to work on other farms during the rainy season to generate extra income. This means leaving his fields to seek employment at a distance, returning every week to ten days to weed his own crops during the rainy

season. The result of these constraints is that his nutrient balance, averaged over two years 1993 and 1994, is negative for nitrogen and phosphorus (-13.77 kg/ha N, -1.36 kg/ha P), though positive for potassium (+5.52 kg/ha K in 1993). He is unable to replenish the fertility of his fields on a year by year basis.

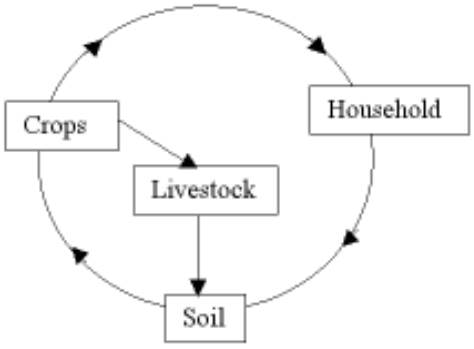


To obtain a better nutrient balance (a biophysical constraint), Salisu needs to resolve several problems. To improve the efficiency of nutrient cycling (crop residues from field to home, manure from home to fields) he needs transportation, either by loan or purchase. Borrowing requires social capital. Purchase requires financial capital, and is precluded by poverty that also prevents him from meeting consumption requirements of his family. So he transfers his much-needed labour from his own fields to labour on other farms. He needs to find off-farm income closer to home, labouring on his neighbours' farms, or off-farm income. If he can maximise such income, he can invest in animals, increasing his manure and saving his own labour for intensive weeding to maximise output.

Case 2: *Eliasu*

Constraint: Labour shortage

Eliasu has 1.2 ha of farmland, and a small household consisting of himself, his wife and one young son (too young to work on the farm, but who will work in future). He owns a donkey, which is used to transport crop residues and manure back and forth between fields and the house. He also owns small ruminants which convert the crop residues into manure. His cereal grain yields average 1087 kg/ha/yr. Eliasu is suffering from loss of vision as he grows older. The demands of intensive weeding are too great for his diminished capacity, and until his son grows older, he has a labour shortage with respect to the size of his landholding, and therefore cannot ensure optimal crop growth and output. The result of these constraints is that his nutrient balance (averaged over the two years, 1993 and 1994) is negative for nitrogen and phosphorus (-13.54 kg/ha N, -0.47 kg/ha P) and in 1993 also for potassium (-7.45 kg/ha/K).



Eliasu copes with this problem in several ways. He hires labour, or rents out land, to alter the cropland to labour ratio. This either requires, or gains him, financial capital. He is waiting for his young son to mature and be able to take on a larger portion of the farm labouring tasks (human capital). Finally, he is fortunate in that village work parties regularly assist him and his son in their farming. This social capital is available to him as he is a respected elder of the village.

Case 3: Asmau
Constraints: (1) insufficient secure access to natural resources, (2) insufficient financial capital

Asmau is a divorcee, having been the senior wife of a village elder for more than 20 years. Wives may be 'given' land of their own to cultivate, as well as having obligations to work on the fields of the husband at certain times. A husband may be more or less generous in such 'gifts', which are used for growing short-cycle millet, sorghum, and marketable crops such as cowpea and *Hibiscus*. Her small income from such sources, and from her off-farm activity (selling processed food items) supplemented her savings accumulated since her marriage, and might be spent on her own or (had she any) her children's needs. She owned two goats and a couple of hens. She could have bought extra land, but lacked the resources to do so. (She might have inherited land, but did not.) Consequently she lacked either enough land to fallow regularly or enough livestock to support a regular manuring regime, and her fields' nutrient stocks and yields were low. Within marriage, therefore, she enjoyed some opportunity for acquiring wealth and status, but such opportunity was dependent on the husband, and never offered a basis for an independent livelihood.

However, Asmau was childless, while the junior wife was able to produce an heir. Consequently her position in the household became marginal, and friction with her husband led to divorce under local custom in 1995. At this point, her entitlement to the 'gifted' fields ceased, and she left the house to live as a client in another household. She was entitled to take her animals and savings (in hardware given her at marriage). Bereft of the means of producing her own food, she fell back on claims to support from her natal family in another village, loans from other villagers and any income she could generate from liquidating savings or working for others. Her ability to improve her position in future rested on her skill in mobilising social and financial capital and unless successful in this, she would not be able to re-enter farming on her own account, however modestly. The consequence of this was persistent food insecurity, yet in a community where every household aims to produce enough millet to feed itself.