



Understanding livelihoods that involve micro-enterprise:
markets and technological capabilities in the SL framework

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1 INTRODUCTION¹

This paper draws together arguments, conclusions and insights generated by research to develop and test practical tools that could help development practitioners use sustainable livelihoods approaches in the particular context of enterprise development.

The essence of *sustainable livelihoods* (SL) approaches lies in recognising the diverse dimensions to poverty, and the multiple strategies that poor people adopt to secure their livelihoods. Since the first articulation of SL thinking in the 1990s, a healthy body of literature and practice has begun to accumulate, based around a set of general principals and a core analytical tool: the SL Framework.

SL literature and practice being relatively new, some gaps are to be expected. Our research and this paper is concerned with two apparent omissions in particular:

- the role which private-sector markets (their structure, participants, functions) play in livelihoods of poor people. As Hobley (2001) notes, the market is missing from the entire SL framework.
- the role of technological change and its contribution to livelihoods. Explicit provision for considering processes of technological change as a determinant of livelihoods is rare.²

The influence of these technology and market factors is pervasive in development, but nowhere more than in the field of micro- and small-scale enterprise development. Constraints and opportunities emerging from processes of technological change and market development are often highly significant factors in the livelihoods of people who depend to a significant degree on earnings from MSEs – whether as business owners, employees or self-employed.

Poor understanding of the ways in which markets and technology are integral to people's strategies and outcomes in the SL approach means that:

- The contribution which a better understanding of market development and technological change processes (including poor peoples own *adaptability*) could make to enhancing poor people's livelihoods, may be over-looked.
- The pro-poor influence which SL advocates seek to have on the objectives and priorities of development programmes may be diminished, if SL frameworks appear not to incorporate issues that seem of intrinsic importance to many fellow development practitioners.

1.1 Objectives of the Research

The aim of the research was to enrich the analysis of sustainable livelihoods which involve MSEs, by integrating concepts and research methods derived and adapted from other disciplines.

The study looked at two conceptual / methodological tools which may be particularly useful:

- 1) The concept of technological capabilities - a bundle of specific organisational skills and linkages that help determine MSE's ability to generate and manage processes of technological change.
- 2) The systems tool known subsector analysis – which models enterprise inter-relations, market channels and linkages in order to create a map of the institutional / market landscape for MSEs.

The outputs of the research are two country case-study reports (Majale & Albu 2001, Ward & Gilbert 2001) based on field work in Kenya and Ghana respectively, and this analytical overview report including recommendations for a revised SL framework for MSE-based livelihoods.

1.2 Methodology of the Research

Step 1: Initial exploration of conceptual framework for linking enterprise analysis and SLF research

This stage involved a UK-based desk study (Scott 2001), the development of new thinking, and a seminar to bench-test these ideas with ITDG practitioners. The desk-study identified common and

¹ The research was conducted during 2001, with the assistance of funds provided by DFID IUDD under the Research Centre Scheme (CNTR 1515A / CNTR 01 2124)

² In a review of livelihoods approaches, Carney et al (1999) found UNDP to be the only organisation to explicitly stress technology in its livelihoods framework.

divergent concepts between SLF, technological capabilities and entitlements thinking. This provides a theoretical underpinning for the research and also links SL thinking to broader concepts of capabilities and entitlements.

Step 2: Testing application of analysis to existing enterprise development projects in the field.

Two studies tested the respective methodologies and concepts associated with technological capabilities and subsector analysis – comparing the information generated by these contrasting approaches with the DFID version of the sustainable livelihoods framework.

- The Ghana study (Ward & Gilbert, 2001) was conducted in an urban community near Kumasi, for whom the timber industry and carpentry in particular is the principal livelihood.
- The Kenya study (Majale & Albu, 2001) was conducted within an urban community in Nakuru, for whom building construction is a major source of livelihood.

Both studies built upon the foundations laid by previous work which had already given the local research partners (KITE in Ghana, ITDG-EA in Kenya) a knowledge of the industry and close links with the communities concerned. In both cases, the fieldwork was preceded by a one-week training workshop to build participatory research skills of local field staff and other stakeholders in the relevant methodologies.

Full details of the fieldwork methods used are given in the separate Ghana and Kenya reports.

Step 3: Synthesis of new comprehensive SLF for MSE-based livelihoods

The two field studies reveal the challenges involved in synthesising the two new conceptual / methodological tools within an SL framework. Knowledge gaps were identified in each case - enabling us to generate recommendations concerning the uses of these tools in applying SL thinking to understand livelihoods involving micro- and small-scale enterprise.

1.3 SL Principals and Framework³

The Sustainable Livelihoods approach is intended to guide researchers, practitioners and policymakers in gaining an understanding of people's strengths (their skills, status, and possessions) and how they use these assets to improve the quality of their lives. It aims to develop responses which reflect the complexity of tradeoffs between the various assets, as well as the political, social, economic and physical context within which people live.

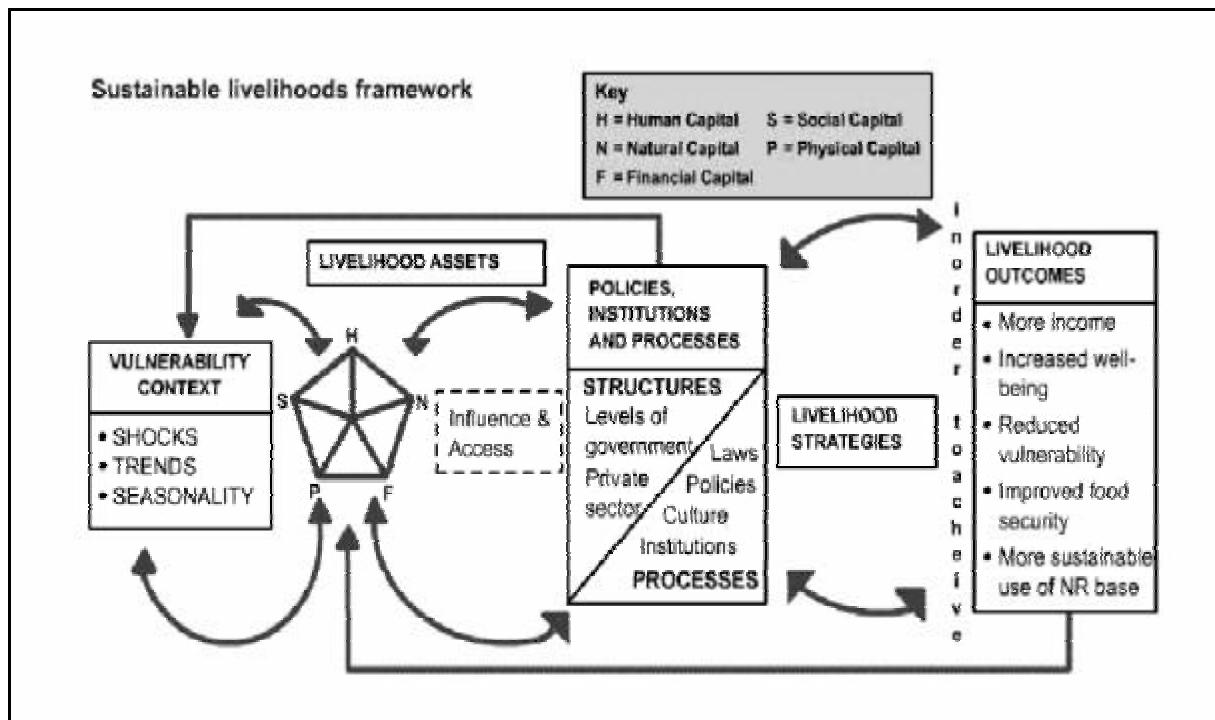
Throughout the research we sought to relate the findings and results to the SL core principals.

Core Principles of an SL approach

- *People centred* – starting with people and what matters to them; working with them, and promoting change in the dimensions of poverty which they prioritise.
- *Holistic* – not restricted by boundaries of professional sphere or 'sector', it should consider the multiplicity of actors, influences, strategies and outcomes that shape people's livelihoods
- *Dynamic* – understanding that people's livelihoods and forces which shape them are ever changing, responding flexibly and developing longer-term commitments.
- *Building on strengths* – replacing a focus on 'needs' with one on 'assets'; realising people's latent potential to achieve their own livelihood objectives by removing constraints.
- *Macro-micro links* – highlighting linkages between poor women and men and the legislative instruments and practices which determine access to assets, define opportunities.
- *Sustainability* – balancing different dimensions such as resilience to negative external forces, dependency on institutions (and in turn their sustainability), non-depletion of natural resources and others' livelihood options.

³ See DFID Sustainable Livelihoods Guidance Sheets – www.livelihoods.org – for detailed explanations of the meaning of each of the conceptual boxes

SL principals are usually applied with the aid of a schematic framework, for organising information about peoples' livelihoods, and understanding the relationships between different factors ⁶.



A further core cross-cutting principal that is starting to come to the fore in SL thinking, concerns "adaptability". Although it is not well elucidated, the concept reflects people's ability to respond to shocks, trends and other changes in their dynamic environment, by adjusting or re-configuring the way they use their assets to pursue new or adapted strategies.

This concept of adaptability is closely related to ideas about technological capabilities as discussed in section 5 below.

2 MICRO-ENTERPRISE, LIVELIHOODS, MARKETS & TECHNOLOGY

2.1 The significance of MSEs in poor people's livelihoods

Manufacturing and processing MSEs play an increasingly significant role in poor people's lives, and are one of the keys to lifting people out of poverty. Some have even described them as the backbone on which the urban economy (especially in secondary towns) survives in most countries in the South (Vanderschueren et al., 1996).

Agriculture's central role in poor people's livelihoods is changing fast. Social and environmental trends – including rural land-hunger, declining crop prices, swelling labour-forces, migration and urbanisation – increase the demand for alternative employment and off-farm livelihood opportunities. Formal employment in large firms and the public sector long since ceased to keep pace with this demand for employment.⁴ So every year millions more turn to small informal enterprises (i.e. MSEs) to make a living: making it the fastest growing area of employment.⁵

Between half and three quarters of those who make or supplement their living from MSEs are women. Most MSEs are trading or retailing ventures. However, up to 40% of MSE employment is based on diverse manufacturing, fabrication, repair, servicing and other value-adding processing activities. This includes crop and food-processing activities on or close to farms.

⁴ For example in Zimbabwe, 700,000 school leavers compete for 40,000 formal sector jobs each year

⁵ 17–25 % working age population in poorest countries find some employment in MSEs (Mead & Leidholm, 1998)

These manufacturing or processing MSEs are worth giving attention to for several reasons. Firstly, in some countries they make a significant contribution to jobs and economic production⁶. Secondly, they have a potentially key role to play in supplying resilient and flexible infrastructure services. Thirdly, compared to petty trading, vending and agricultural labouring, they tend to generate relatively good incomes for workers. Finally, being relatively labour-intensive, MSEs support a proportionately larger number of livelihoods per unit of output than the larger-scale firms with whom they compete.

2.2 The role of market structure and dynamics in MSE fortunes

Although they operate in very informal, unregulated environments, the fortunes of most manufacturing, processing and many service-sector MSEs are connected by supply chains, through production channels and the influence of competition, to mainstream commercial markets. These interrelationships increasingly link MSEs' performance to the behaviour of large firms and other actors in economic networks. More than ever before, an effective analysis of market structures and market dynamics is essential to understanding the livelihood strategies and options of poor people who work in MSEs.

2.3 The role of technological change in MSE fortunes

A significant determinant of market dynamics and competitive pressures on MSEs are long-term patterns of technological change. These patterns are associated with innovation in communications, greater trade in technology and goods, and opening up of global markets. In the context of rapid external changes, even small improvements (or the lack of them) in MSEs productivity, product quality, organisational methods and support structures can make a significant difference to MSEs economic returns and vulnerability.

In principal, poor people stand to gain from technological change – generating easier access to information, higher productivity, lower input costs, less wastage and better environmental management. However the pace and volatility of change can be a problem, particularly when MSEs are left behind by larger competitors, or forced to take on greater risks in order to compete. As a result, the livelihood outcomes that MSE owners and workers experience in practice, is likely to be increasingly determined by MSEs' capacity to generate and manage technological change.

In the long run, an effective analysis of the factors that influence technological change in and around MSEs is key to understanding the livelihood strategies and options of poor people who work in them.

3 MARKETS IN THE SL FRAMEWORK

3.1 Missing Markets in the SL Framework

Private sector markets represent powerful institutional structures influencing poor people's livelihoods. Their behaviour is governed by a variety of social, cultural and political processes in addition to "natural" economic laws of supply and demand.

The vast majority of MSEs' operate rather in markets which are non-perfect in myriad ways. In the absence of sophisticated legal and contractual structures, competition law and regulation, these markets suffer from high transaction costs, monopoly distortions (due to limited choices of buyers or suppliers), various types of information failure, mistrust, uncertainty and risk aversion. Such market failures reduce responsiveness to changing demand, discourage investment, lock MSEs into unrewarding activities, create bottlenecks, and sometimes facilitate outright exploitation.

The actual structure and behaviour of any particular market, including the degree of access which MSEs have to it, thus has a major influence on the returns that poor people make from their assets, labour and enterprise. Given the importance of real market structure and dynamics in determining livelihood outcomes, it is perhaps surprising therefore how little emphasis private sector activity and relationships have been given as yet within the Policies, Institutions and Processes (PIPs) box of the SL Framework (Hobley 2001)

⁶ 5% of total GDP in Kenya comes from manufacturing micro enterprises with less than 10 employees. They employ over 430,000 people – more than the large scale private and public sectors (Daniels, 1999)

3.2 Appropriate tools for meso-level analysis

Private sector market structures and processes can and must be approached at different levels, and a core principal of SL approaches is that we look for ways of linking the macro and micro-level analyses.

Macro-level concerns include trade and investment policies, competition law, fiscal and monetary policy, legal and judicial infrastructure for commerce and financial regulation. The focus of interventions at this level should be on creating favourable conditions - "enabling environments" - for small business investment and growth, by reducing distortions and market failures that stifle economic activity (DFID 2001).

At the micro-level, we need to understand social structures and cultural practices, power relationships within households, and between suppliers, producers and buyers, that influence people's access to markets, to technology options and to control over economic returns. Objectives here focus on understanding the complexity of these forces in order to negotiate social or political reforms that increase equity and empower the poor (i.e. that level the playing field).

Between macro-level economic stability/efficiency and micro-level social equity, lies an arena of analysis that is concerned with institutional behaviour, market dynamics and interrelationships. This meso-level is a fruitful arena for analysis and intervention, bearing in mind that:

- a. Institutions and agencies that mediate regulations and policies are highly variable in their effectiveness and equity. The behaviour of local officials is a powerful factor in determining the actual business environment MSE's experience. Thus local institutional strengthening and reform may be much more significant than national policy initiatives, at achieving pro-poor outcomes.
- b. In dynamic markets, the key to creating better employment and income generating opportunities for poor people lies more in enabling MSEs to continuously identify and exploit new economic opportunities and market developments as they emerge, than in the pursuit of a notional "level playing-field".
- c. The most influential "institutions" in this context may be other economic agents in the market: large firms, service providers, international buyers - whose influence extends to determining the structure, function and dynamics of the market that MSEs operate in.

Shifting the level of analysis to this meso-level, while linking into the macro and micro pictures, requires a different set of analytical tools. We chose to utilise "subsector analysis", since this takes a systems-based approach which is particularly conducive to a link with an SL framework.

3.3 Subsector analysis

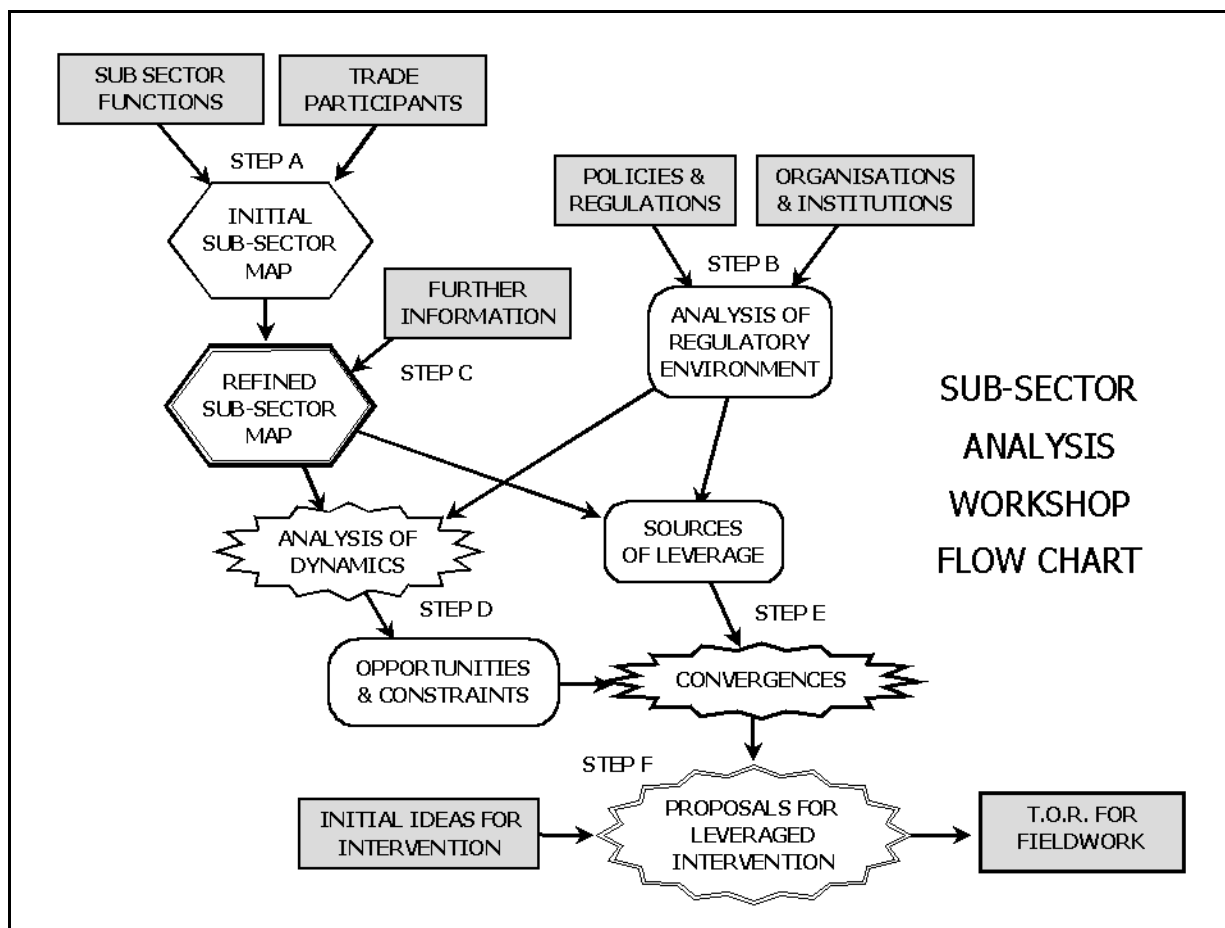
There are many market analysis techniques in the world, but most focus on assessing markets for specific products or services. An SL perspective however requires an *holistic* picture - one that examines the whole market system within which MSEs operate. This is particularly true in the less developed markets that often characterise micro-enterprises' operating environment. Although not conducted specifically within an SL framework, recent research involving ITDG and four other NGOs found that a systems perspective is fundamental to successful interventions for enterprise development in this context (Dawson *et al.* 2001).

Subsector analysis was first described and applied by the USAID-supported GEMINI project in the early 1990s as a way of identifying markets in which there are opportunities to help MSEs grow (Haggblade & Gamser, 1991). It is intended to be diagnostic, as opposed to merely descriptive. It starts from a recognition that MSEs operate as participants in complex economic systems, so their situation and growth prospects cannot be understood when viewed in isolation. It involves studying the networks of relationships linking suppliers, processors, transporters and traders in ways that connect MSEs with final consumers of goods and services. A typical subsector analysis identifies:

- the different stages of production, processing and marketing, and the value added at each stage
- which actors - small-scale, large-scale, imports, etc. - are active at which stage;
- what the constraints are on MSEs playing a greater role at each stage; and
- what are the most cost-effective ways of helping them to do so.

A crucial characteristic of the technique lies in the methodical steps taken to converge information drawn from understanding the policy and regulatory environment, from mapping the structure of the market, from analysing the key trends and dynamics in the market, and from identifying points of leverage where interventions might have greatest impact. In this respect subsector analysis is holistic, systemic (multi-level) and intervention-orientated.

The final output of a subsector analysis process should be a well-focussed set of intervention ideas characterised by convergence between opportunities/constraints for MSEs and identified sources of leverage. The flowchart below shows the subsector analysis process employed in this research.



4 RESULTS OF USING SUBSECTOR ANALYSIS AS AN SL RESEARCH TOOL

ITDG conducted livelihoods research in two communities in early 2001.

- The Ghana study (Ward & Gilbert, 2001) was conducted with the Kumasi Institute of Technology and Environment (KITE) in an urban community near Kumasi, for whom the timber industry and carpentry in particular is the principal livelihood.
- The Kenya study (Majale & Abu, 2001) was conducted with ITDG East Africa within an urban community in Nakuru, for whom building construction is a major source of livelihood.

In these parallel studies, subsector analysis was explicitly used to supplement knowledge derived from other forms of SL enquiry including participatory needs assessment, stakeholder analysis, wealth ranking, focus group discussion and individual interviews with households, enterprise owners and workers. Full details of the research are described in the two reports.

The first objective was thus to test the practicality of adapted subsector analysis as a participatory SL tool that could be effectively assimilated by a local institution and its research staff.

The second objective was to investigate what value, if any, subsector analysis added to our overall understanding of people's livelihoods.

4.1 Are subsector analysis tools practical?

Early studies using the GEMINI subsector toolkits generated criticism that the methodology was too complex, time-consuming and costly – requiring research resources and analytical expertise beyond the ambit of most development practitioners and agencies who might actually apply the findings. Many studies conducted in early years still languish unused on shelves (van Assouw & Albu 2000).

Since then, the techniques have been incrementally improved by practitioners – made less analytically demanding and adapted to facilitate greater participation (Van der Land & Uliwa 1997). Frank Lusby in particular has demonstrated how subsector analysis can be adapted and applied in practical programme contexts, using participatory approaches that facilitate the translation of analysis into action (Lusby 1997; Lusby 2001).

Nevertheless, uncertainty remains about the practicality of subsector-type approaches for the kind of numerous rapid participatory low-cost studies that are most needed to enrich SL investigations. These we set out to test.

We adopted a “quick and dirty” methodology for subsector analysis that emphasised participation by informants, that prioritised insiders knowledge, and sought as far as possible to keep the analysis in the hands of the principal stakeholders. Information was verified where possible by triangulation between different sources. Indeed much of the fieldwork was conducted in parallel with information gathering exercises looking at other aspects of people’s livelihoods. We found that:

- Subsector analysis tools were comprehensible to local researchers / field-staff

ITDG-EA (in Kenya) and KITE (in Ghana) both engaged a small number of graduate-level field-staff to conduct the research. They participated in a three-day orientation workshop, in the subsequent design of questionnaires and interview formats, and the analysis of results. There was a high level of satisfaction with the methodology. ITDG-EA staff were sufficiently impressed that the organisation is seeking to adopt the methodology in other programme work in Nairobi. KITE also have plans to continue using these tools. The fact that these modestly-resourced local research organisations feel capable to begin adopting these analytical tools is encouraging.

- Subsector analysis orientation workshops were able to engage key informants and stakeholders

There was good evidence to suggest that key informants and other stakeholders found the subsector orientation workshops rewarding and engaging. In Ghana, carpenters’ representatives stated that workshops had “opened their eyes” to constraints in their industry, helping them to think about the influence of trade groups and institutions outside their immediate milieu. In Kenya, all but one of the workshop participants (anonymously) evaluated the workshop highly.

- Key analytical steps still require an experienced facilitator

The subsector analysis methodology was broken down (for pedagogic reasons, by the original GEMINI authors) into a number of discrete steps. This lends itself to a participatory approach: enabling the development of the analysis at each step to be easily comprehensible to, say, the participants in a stakeholders’ workshop. Ideally, the process would build systematically from participants / informants own knowledge towards an analysis of the most favourable intervention ideas, without losing their identification with these outcomes.

In most respects, we found this aspiration realised in practice. Participants, for example, observed that the subsector workshops enabled them to bring together and organise their own knowledge and understanding of their industry.

Certain key steps in the process were not however purely “logical” exercises. In particular, in both Kenya and Ghana, step D involving “analysis of subsector dynamics” in order to identify key opportunities and constraints for MSEs, seemed to require a degree of expert intuitive insight. Such externally-provided insights or leaps in understanding, risk undermining the participatory nature of the process and require careful handling. They require the “facilitator” to adopt an “expert” role. This implies that widespread adoption of subsector analysis as an SL tool requires the training of a cadre of facilitators with specific experience in this methodology.

- SA is cost-effective as a quality participatory research approach

Although it is problematic to evaluate the “cost-effectiveness” of research tools, we found that the time and costs invested in conducting the research using subsector analysis tools were relatively modest in relation to the quality and quantity of useful information generated.

Working with field-staff inexperienced in these tools, the basic orientation workshop and field research in each country was completed in less than three weeks. Subsequent analysis required two weeks. Considering both subsector analysis activities, and other livelihoods investigations, a total budget of £8 - 9,000 was spent in each country, augmented by 20 days training, facilitation and analytical input from the external researcher.

These costs were however significantly inflated by the learning-process for local researchers and could be expected to be significantly lower for repeated exercises – such as would follow from the systematic adoption of subsector analysis for SL investigations.

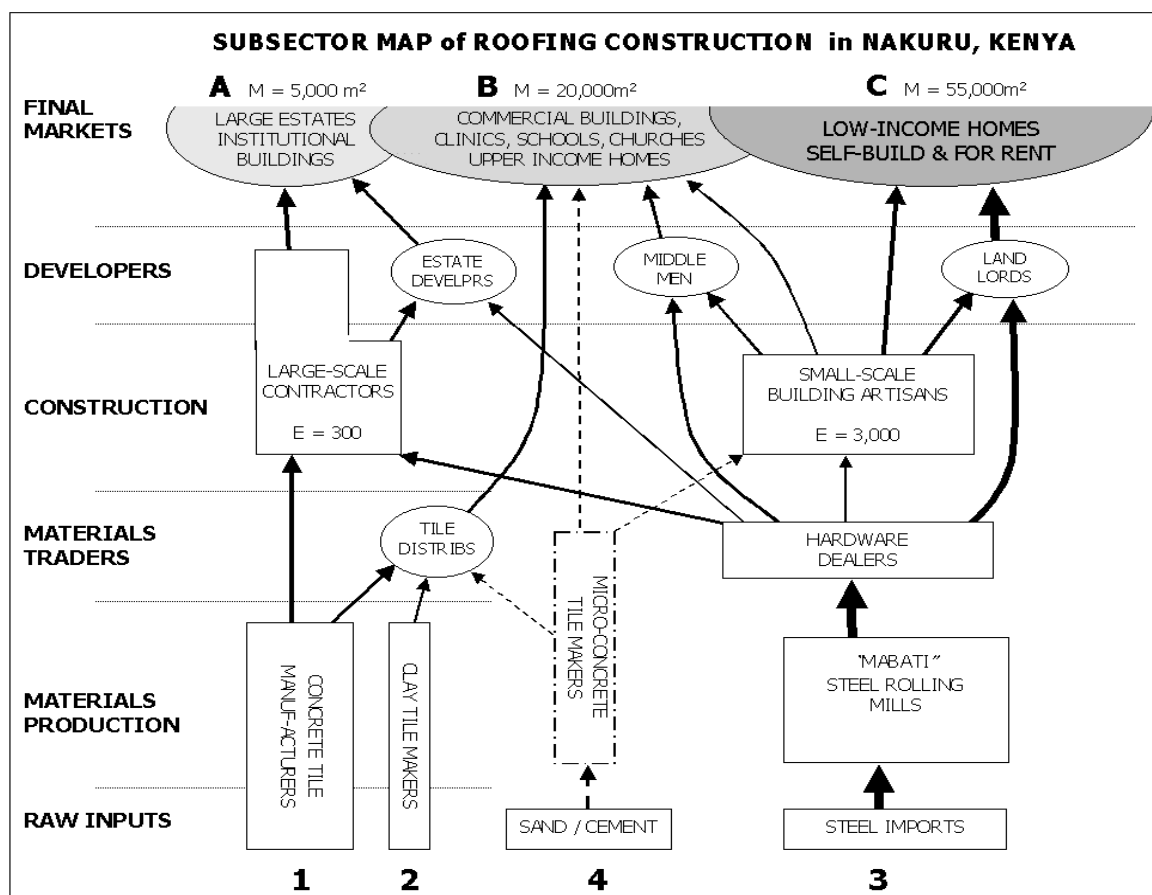
4.2 What value does subsector analysis add to an SL approach?

Having established that subsector analysis tools can be applied in the real world, the acid test concerns their value. What extra knowledge or operational advantages do these tools generate, over and above techniques that are already widespread in SL research. The fieldwork in Ghana and Kenya broadly generated very positive answers to this question:

- Subsector maps as communication aid

A key feature of the subsectoral approach is the schematic mapping of relationships between trade groups, functions, production and distribution channels within a subsector.

Mapping exercises (repeatedly updated as understanding develops) are a key part of the participatory “analysis” process. The maps give visual representation to workshop contributors’ knowledge and can be a powerful stimulus to participation (an effect reflected in other PRA mapping tools).



A secondary benefit of mapping emerges as a communication aid in interviews that took place in the industry and community after the preliminary workshop. Respondents commented on the preliminary maps as representations of the market context in Nakuru, and the maps provided a tool for talking about relationships and factors that influence the subsector. One researcher commented:

“The map creates excitement and interest in the subject matter for the interviewee(s) and widens the scope and dynamics of issues being investigated. The subsector map in my view added to participatory tools used during focus group discussions.”

Given the practical difficulties that usually obtain in getting the time and co-operation of key stakeholders, particularly in the private sector, this effect was highly valuable. Information that would otherwise probably not have been obtained or would have required more greater research effort, was incorporated into the analysis.

- Generating a Research Focus (Questions / Institutions)

An open-minded analysis of market structures and processes inevitably tends to throw up many potential areas of enquiry and sources of information. Where research time and resources are strictly limited, the quality of research depends a lot on early identification of the most critical research questions and the most useful informants.

We found that subsector analysis was particularly valuable for narrowing down the focus of enquiry to create a manageable and relevant agenda for fieldwork interviews. Firstly the subsector maps illustrated which channels and thus actors in the market are likely to have an influence on our target MSEs. Secondly, the whittling down of potential intervention ideas to those which show a convergence between opportunities and “sources of leverage”, enabled the research team to narrow the scope of interview topics to those which were most likely to be of practical relevance to livelihoods in our target community.

- Subsector analysis aided “objectivity”

Any participatory process that is explicitly “quick and dirty”, risks suffering from participant biases may significantly distort the research results. Biases may echo the personal agendas of “representatives”, or worse, they may be a reflection of what participants believe the researchers want to discover. The subsector analysis methodology seemed to be effective in penetrating these biases.

For example, in Nakuru, ITDG-EA has been working on urban housing issues with the local community⁷ since 1995 and has a reputation for technology-orientated expertise. Three of the workshop participants – who represented small-scale building artisans – no doubt felt they had an interest in seeing a new project to disseminate construction technologies emerge as an outcome. It was therefore hardly surprising that, their influence led the Nakuru subsector workshop to focus much of its attention on opportunities for local MSEs to develop manufacture and use of a locally-novel building product (that is: MCR tiles).

Subsector analysis, however, revealed that investment in MCR production was unlikely to be rewarding in Nakuru and certainly would not generate livelihood benefits for a significant number of people. This result, although disappointing, was owned by the representatives and indeed local ITDG-EA project staff because it was generated from their own knowledge, and involvement in the analysis process. As a result, MCR tile initiatives were ultimately dropped in favour of other interventions.

- Empowering as well as informing participants

We described above how the subsector workshops enabled representatives of the artisans / micro-entrepreneur community to feel they understood the structure and function of their own industry better. In several ways, the analysis enabled participants to use their own knowledge more confidently and effectively.

In Nakuru, building artisans were able to see for themselves how trends in the availability and cost of certain input materials (timber, cement) were likely to affect the market for different types of roof construction. This in turn seemed likely to influence their future livelihood strategies.

⁷ Integrated Urban Housing Project – for details see: Majale & Albu, 2001

In Kumasi, carpenters were able to realise the significance of recent policy changes in the forestry regulation and licensing, opening up intervention ideas related to their access to key resources such as timber off-cuts and low grade lumber, and the pursuit of Timber Utilisation Permits.

The workshops illustrated the value of participation in a knowledge-generating process about markets, as distinct from mere access to market information. Where access has been unreliable or sporadic – the norm for poor people – suspicion of market information is natural: all the more so when the information is unwelcome, dashing hopes or pointing to problems ahead. Active involvement in the analysis process, of course, changes the relationship that poor people have to information – gives them more confidence to use it in their lives (to transform it into that human asset we call knowledge), and is thus empowering even if the information itself may be unwelcome.

- Leading to intervention ideas

Finally, but most importantly, a subsector approach is orientated towards the identification of practical intervention ideas with real potential. It is diagnostic. This is achieved by a ruthless paring away of ideas that do not respond to a convergence between MSE-based livelihood constraints/opportunities (derived from analysis of market dynamics) and features called “sources of leverage”.

The explicit search for “leverage” is based on the pragmatic need to intervene only in ways which are cost-effective and promise to benefit significant numbers of people. A source of leverage represents a scaling-up mechanism, usually associated with one of the following:

- i. Areas of Policy Constraint – issues in the legal or regulatory environment, including restrictive practices, whose resolution would improve the livelihood options of large numbers of people
- ii. Enterprise Clusters – geographical concentrations or associations of similar enterprises that facilitate rapid and low-cost dissemination of new ideas, services or skills
- iii. Subsector System Nodes – points in the economic map where supplies or services (including for example business development services) pass through a small number of hands

For example, the Ghana study identified policy constraints related to the regulation of timber felling and utilisation as an important source of leverage. These converge with one of the main opportunities for improving carpentry artisans’ livelihoods and reducing degradation of natural resources – namely improving supply of legally harvested lumber to the domestic market. Specifically, the study highlighted inadequate enforcement of quotas intended to guarantee domestic traders and carpenters have fair access to this highly restricted and regulated natural resource, and recommended that the Forestry Commission be lobbied to ensure permits are not monopolised by export companies.

5 TECHNOLOGICAL CAPABILITIES IN THE SL FRAMEWORK

5.1 Technology in the SL Framework

This section is concerned with technology and technological change. In a world influenced by rapid technological developments, the capacity to cope with, generate and manage change (whether gradual or in the form of “shocks”) seems likely to be a key factor determining the livelihood strategies of poor people involved in micro-enterprise (section 2.3). Individuals and enterprises who are able to generate and manage changes more effectively – i.e. by reconfiguring their resources/assets more quickly and efficiently - are likely to have significantly better livelihood options.

Technology is now widely perceived as having at least four inter-related constituents - technique (machines and equipment), knowledge (‘know how’ and skills), organisation (systems, procedures, practices and support structures), and product (design, specification) (Scott, 1996; UNDP, 1999). It is easy to see therefore why discussion of technology in the SL approach has been subsumed in discussion of capital assets: ‘skills and knowledge’ correspond to human capital, machinery and equipment to physical capital, and ‘organisation’ to social capital.

Any reduction of technology into its apparently separate components, however, risks *missing the wood for the trees*. Technology is only an asset to the extent that people are able to bring together techniques, knowledge, organisation and product in appropriate combinations. In effect, the value of technology is an emergent property generated by the judicious combination of these components. In the context of micro-enterprise-based livelihoods, such combinations become valuable when they

enable poor people to respond to external economic opportunities (or threats) in more efficient, more sustainable and/or less risky ways.

In its basic principals, an SL approach should be conducive to understanding the role of technology in this way. After all, SL encourages consideration of inter-relationships between various elements of a livelihood strategy, and how these change in response to changes in the external context.

Unfortunately, up to now, the treatment of technology has been restricted and rather static. Rarely is there explicit provision for technology as a determinant of livelihoods⁸. Where there is provision, it tends to be accompanied by the assumption that technological change is only instigated exogenously, and that micro-entrepreneurs merely act as passive recipients.

Technology change is however generally a process that involves much incremental innovation and adaptation. Individual technology users are necessarily involved in effecting these changes – learning new skills, designing new products, reconfiguring systems, accessing new linkages; but this innovation is not necessarily stimulated from outside. An understanding of technology's contribution to livelihoods must therefore consider above all the factors that enable poor people to actively establish and re-establish effective combinations: to adapt and innovate in other words. It must seek to investigate what, for example, influences the ability of a micro-entrepreneur to set up a happy convergence of product specification, skill, process capability and market linkage – and maintain it in the face of a rapidly changing external environment?

5.2 The concept of *technological capability* and its measurement

The adaptive ability to generate and manage technological change (including the recombination of one's assets in more viable or sustainable ways) is encapsulated in the concept of *technological capability*. This has been defined as the ability to select technologies appropriate for the work being done; to absorb and adapt technologies into local settings and to develop new technologies, processes, products and linkages through local innovation.⁹

In the context of enterprise development, technological capability encompasses for example the ability to recognise market opportunities and source the necessary raw materials, skills and production equipment that enable MSEs to respond to changing market conditions¹⁰.

A strong analogy can be drawn, at this point, between our argument that *technological capabilities* are distinct from technical assets, and the distinction which Krishna (2001) recently made between stocks of social capital and the *capable agency* required to translate these stocks into high development performance (i.e. flows of benefits).¹¹

We would like to understand what factors contribute to the accumulation of such adaptive capability. One problem, however, is that it is a tricky attribute to measure or assess objectively. More than, say physical capital assets or human assets (measured by educational achievement), technological capability resists quantification.

⁸ In a review of livelihoods approaches, Carney *et al.* (1999) found UNDP to be the only organisation to explicitly stress technology in its livelihoods framework.

⁹ For a more thorough discussion of the technological capability concept see Romijn (1998)

¹⁰ According to Dawson & Jeans (1997) limited technological capabilities consistently emerge among the most important constraints on small producers' ability to exploit new market opportunities.

¹¹ Krishna's empirical research in 60 Indian villages, revealed how "social capital" and "agency capability" are relatively independent factors, though both are necessary to achieve flows of development benefits.

We adopted a relatively simple technique – one that has proved valuable in other contexts¹².

Measuring Technological Capability – a “quick and dirty” methodology

Micro-entrepreneurs were asked to describe recent innovations, positive adaptations or changes

- in the products they sell,
- in production techniques and processes, or
- in the way that their enterprise organises its business (including the form of relationship with suppliers / buyers / contractors)

They were then asked to rate the impact of these innovations or changes on their businesses, in order to get a sense of the “weight” of different changes cited.

On the basis of collated responses, enterprises were categorised as having relatively low, medium or high technological capability (relative to each other).

It should be noted that this method of assessment involves a subjective decision (on the part of the interviewer) and it is therefore important that the same individual or a tightly knit research team makes comparisons. Also the results can not be used to benchmark enterprises operating in different trades, whose “normal” rate of innovations may vary greatly. Its value lies in detecting and ranking the degree of adaptability of enterprises within a similar cohort.

5.3 Differences between technical status and technological capability

One way to circumnavigate the subjectivity problem above, is to use the physical assets (tools and machines) of an enterprise as a proxy for its technological capabilities. Not surprisingly, we find this unsatisfactory – since it obscures precisely the distinction between the technical status of an enterprise and its dynamic capabilities, that we would like to understand better¹³.

In order to test our assumption that dynamic technological capabilities can not simply be inferred from observing enterprises static assets, we therefore also took a snapshot of enterprises' capital assets and technical skills (as indicated by the degree of sophistication in production processes, tools and machines). These observations¹⁴ formed the basis of an assessment of “technical status” that was compared with our appraisal of technological capability (see Ward & Gilbert 2001).

5.4 Determinants of technological capability

There is a substantial body of literature devoted to exploring the determinants of technological capability. Key elements are generally agreed to included:

- a) formal education & training;
- b) integration of prior experiential learning;
- c) learning on the job, learning by doing ;
- d) entrepreneurial attitudes and confidence;
- e) institutional support;
- f) cultural environment;

A useful discussion of these elements is provided by Lowe, in her analysis of participatory approaches to technology development (PTD)¹⁵. A key element of the process is institutional support to learning.

¹² For details of our approach to measuring technological capability or “innovativeness” see Ward & Gilbert (2001). This was derived from that used by Romijn & Albu (2002).

¹³ The capabilities that people have “are not simply resources that people use in building livelihoods: they are assets that give them the capability to be and act.” (Bebbington, 1999)

¹⁴ This framework for assessing technical status was designed by carpenters themselves

¹⁵ See chapter 4 of Mason (2001) discussing “Participatory Technology Development” approaches. PTD aims to involve technology users in identifying, defining and resolving their own technological needs, in ways which optimise the use of indigenous human and social assets. PTD is credited with generating not only more appropriate and sustainable solutions, but also with building technological capabilities – by helping poor people to value their own knowledge and experience, access new ideas and develop their analytical skills.

In particular, it is important to understand which institutions and practices are effective in providing poor people with access to knowledge that informs innovation, and the processes by which this happens. Although this is only one dimension to the determination of technological capability, it is potentially more interesting than factors (such as formal education, cultural environment) which are less amenable to practical intervention in the short term.

For the purposes of this research, we again wanted a “quick and dirty” toolkit for investigating these factors in our target community’s livelihoods, and elected to investigate the sources of knowledge that people use to introduce change.

Determinants of Technological Capability - a “rapid enquiry” based on sources of knowledge for innovation

Micro-entrepreneurs were shown a list of 10 categories that had been drawn up in a previous focus group discussion among subsector representatives.

Respondents were asked to identify and rank the categories that they considered “important as sources of information used in the introducing innovation and change which they had described earlier”.

6 RESULTS OF USING TECHNOLOGICAL CAPABILITIES IN SL RESEARCH

6.1 Experiences from Ghana¹⁶

The research in Ghana used the three forms of enquiry described above to supplement information about “support institutions” that was generated from focus group discussions with carpentry artisans. Detailed interviews took place with owner-artisans in 21 carpentry enterprises. A broad range of “scores” for technical status indicated some diversity within the subsector.

Comparisons between enterprises’ technical status – indicted by tools, quality of materials, designs and workshop layout – and innovation / technological capability were informative. There was a low correlation¹⁷ between these two characteristics: supporting our assumption that technological capability can not be assessed merely by observing an enterprise’s physical assets, or current production standards. In fact the three enterprises with the highest technical status ranking, were not judged to be highly innovative.

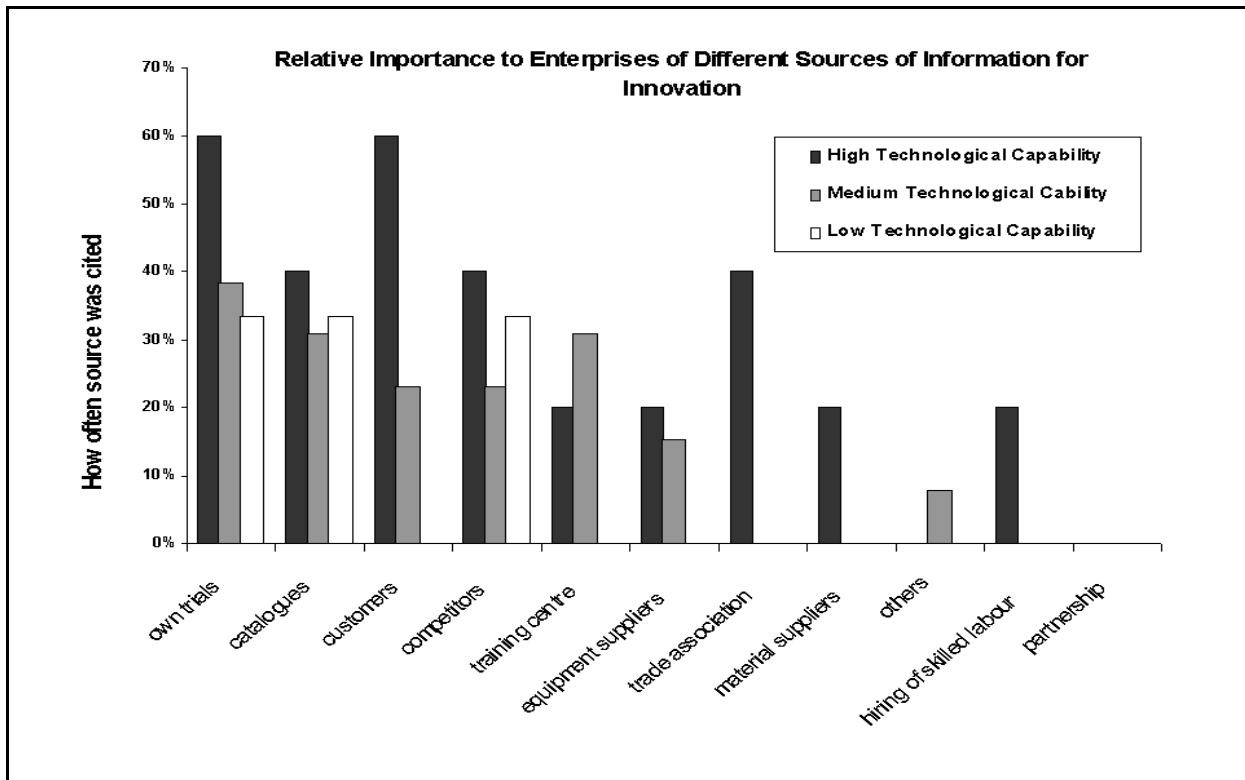
Moving on to the sources of knowledge which micro-entrepreneurs identified as important for innovation, adaptation and change, some interesting patterns emerged:

- The most innovative / adaptive enterprises cited (on average) twice as many sources of information as those with lower ratings for technological capability.
- The least innovative micro-entrepreneurs had very narrow sources of information: citing only “catalogues”, “own trials” and copying “competitors”.
- Conversely, the most actively innovative enterprises drew on diverse sources, including trade associations, training centres, equipment and material suppliers.
- One of the most significant differences between enterprises with low and high technological capabilities, was that the latter regarded “customers” as highly important sources of information

This result, although based on a small data set, hints at the importance of linkages and social capital (know-who) that is geared to accumulation of particular types of technical and business knowledge.

¹⁶ See Ward & Gilbert (2001)

¹⁷ Correlation coefficient $R^2=0.20$, although not a statistically significant result given the small data set



6.2 What value do technological capability research tools add to an SL approach?

The research exercise conducted in Ghana formed only a minor component of the overall SL study and used a small number of interviews. Nevertheless, it provided the research team with important insights:

- Enabling identification of individuals with high adaptive capabilities

If we want to understand the factors that constrain or enable poor people in putting together sustainable livelihood strategies, it is natural to look at success stories. However, we should not confuse the symptoms of success with its causes. High technical status is not necessarily indicative of technological capability, any more than wealth is indicative of the kinds of adaptability that the poor need to survive.

The simple technological capability toolkit described above offers a methodology for distinguishing individual people / enterprises that have more adaptive capabilities; as opposed to those that are merely asset wealthy.

- Generating a Research Focus (Questions / Institutions)

The tools help narrow the focus of enquiry on to the factors that are most likely to be significant in generating sustainable livelihoods. By comparing, in this case, differences between the sources of knowledge which more and less innovative individuals draw on, it is possible to speculate more accurately about which are most valuable for promoting change. Such discrimination would not be possible with a general interview approach.

This kind of focussing enables one to direct research resources towards the most effective kinds of intervention.

7 SUMMARY & CONCLUSION – AN SL FRAMEWORK FOR MSE DEVELOPMENT

7.1 Summary of Results

The research which generated this paper was inspired by an initial concern that SL approaches may not achieve their full potential as tools for pro-poor development, nor succeed in engaging practitioners in the field of small enterprise development, unless the SL framework addresses issues to do with markets and technology more explicitly.

In this paper, we have summarised the lessons learned and insights gained from conducting SL research among poor communities in Ghana and Kenya, for whom income from micro-enterprise activities is a key component of their livelihood strategy. We specifically examined the use of two analytical tools which we believed might offer advantages for understanding market dynamics and processes of technological change.

Subsector analysis was shown to be a valuable tool for understanding market structures and processes, for diagnosing opportunities for pro-poor enterprise development and prescribing possible interventions. It was found that this methodology, appropriately modified is comprehensible to field staff / local researchers with only modest training; and enables local stakeholders & key informants to engage in relatively subtle process of market analysis. Although, even after modification, the process was found to require an experienced facilitator, it was judged cost-effective as a participatory research tool which produced valuable results.

Subsector analysis added value to our SL investigations in the following ways:

- a. subsector maps act as a communication aid in research and planning
- b. subsector analysis facilitates greater objectivity and consensus on the part of stakeholders
- c. subsector workshops empower, as well as inform, participants
- d. subsector analysis aids selection and development of intervention ideas that have practical potential to achieve significant pro-poor benefits.
- e. subsector analysis overall helps provide focus to more detailed livelihood investigations / local fieldwork

The concept of technological capabilities was similarly demonstrated to be useful in investigating the adaptive processes, particularly the institutional support mechanisms and knowledge flows, that generate technological change among small enterprises. A simple method of measuring technological capabilities and investigating certain aspects of their determinants, was tested which enabled researchers:

- a. to identify / select individuals with relatively high adaptive capabilities
- b. to thus determine which support institutions and types of knowledge flow are most significant in enabling innovation and adaptation
- c. to generate a research agenda focussed on key questions about specific support institutions which play a locally important role in technological change.

It emerged that a key positive characteristic of both tools is their explicit engagement with dynamic issues: processes of change occurring and being instigated both from within enterprises and in their external operating environment.

These results suggest that, at least in the context of livelihoods involving micro and small enterprise, some adaptations to the SL Framework would be advantageous.

7.2 Emphasising the Market in PIPs box

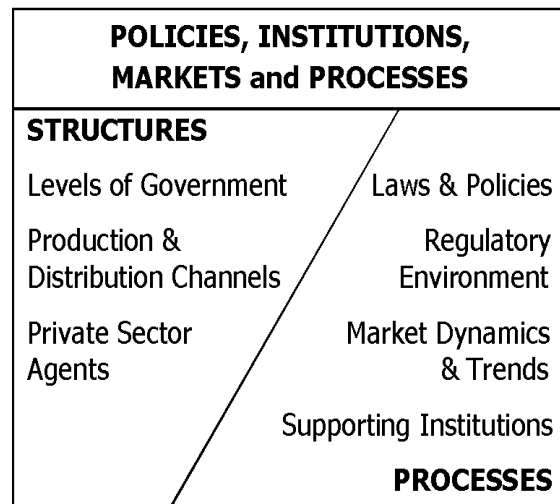
Current versions of the SL framework recognise the “private sector” as a part of the structure of the PIPs environment within which poor people operate. There has, however, been little guidance about how to analyse this structure. Also there has been almost no recognition of associated processes (market dynamics) that may influence the structure and function of the private sector, other than at the level of general trends which may be identified by an investigation of people's vulnerability context.

Our research suggests that private sector structure, function and market characteristics need to be treated more explicitly within the PIPs box. In addition to the general aspects already emphasised in conventional SL frameworks, components of analysis that should be explicitly addressed include:

- Understanding of private sector market structure in terms of competing channels of production / distribution within which individuals operate
- Understanding the role and influence of key private sector agents (whether they be large firms, buyers, suppliers, traders, brokers) who operate in any given "subsector"
- Understanding of the actual regulatory environment experienced by micro and small-scale enterprises, as mediated through the practices of local institutions and officials
- Understanding of market dynamics and trends, and the opportunities for influencing and / or responding to these through well targeted interventions (including technological change)
- Understanding the role and influence of the main supporting institutions, whether public offices, NGOs or private business development service providers

This paper has suggested a methodological toolkit: subsector analysis which provides one way of tackling such an agenda.

The PIPs box for an SL framework designed for this type of investigation looks like this:



7.3 Capabilities within the Asset Pentagon

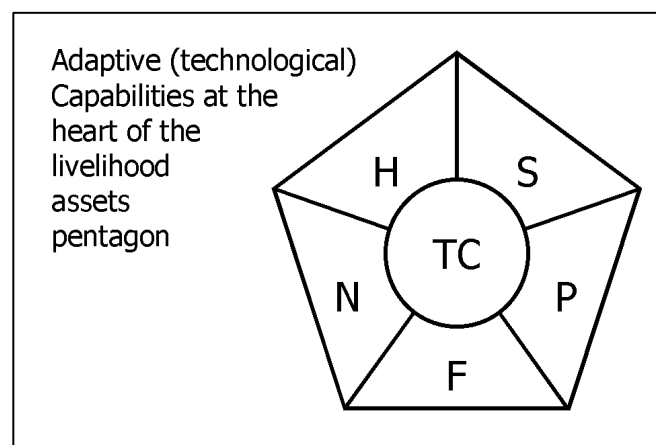
People's assets and external environment are continuously changing. So too, therefore, is the set of options for livelihood strategies. However, the extent to which people's assets can be used to achieve desired livelihood outcomes is determined in large part by people's capability to re-combine their assets in response to change.

In order to understand the dynamics of people's livelihoods, the SL approach must regard assets not only as things that allow survival, adaptation and poverty alleviation, but also as the basis of individuals' capability to act and to change the rules that govern the control, use and transformation of resources (Bebbington, 1999).

Our concern has been with the particular combination of physical, human and social assets that is known as technology. Technology is, after all, the mechanism through which people realise the value of their assets by transforming their labour and natural resources into food, shelter, health, income or other desired livelihood outcomes. The associated technological capabilities that enhance people's ability to generate and manage technological change are crucial to sustaining livelihoods, particularly those based on micro- and small scale enterprise.

Our research suggests that technological capabilities should be placed at the heart of the analysis of people's livelihood assets.

Although the methodological tools for doing this are still somewhat embryonic, this paper has described simple approaches to the measurement and investigation of technological capabilities which deserve further attention.



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