

Chapter 8: Conclusion: Livelihood enhancement in the new South Africa

8.1 Introduction

The aim of this research has been to examine the changing livelihood-environment links and opportunities for enhancing livelihoods in the poverty-stricken dryland region of Sekhukhune District. Individual chapters have presented and discussed the research findings in considerable depth. This chapter concludes the thesis by summarising and integrating a selection of the most pertinent findings on livelihood-environment dynamics in Sekhukhune under the three research objectives. Some important implications for practical intervention to enhance livelihoods in Sekhukhune and in rural South Africa more generally, and for further research, are reiterated, and broader academic and methodological implications of the research are also identified.

8.2 Summary of main findings

The objectives of this research were threefold:

- 1) To identify and critically evaluate narratives of development and land degradation in South Africa and their linkages to international directives;
- 2) To examine the dimensions and dynamics of contemporary livelihoods in the study area, with special regard to the contribution of land-based practices to broader livelihood portfolios and to local understandings of land use, land management and environmental change;
- 3) To investigate the justification for and efficacy of interventions grounded in dominant environment-development narratives in enhancing livelihoods and changing environmental processes.

To address Objective one, the historical development of two key overarching South African environment-development narratives, thought to exert considerable influence over interventions to redress the development and environment legacies of apartheid, were analysed: Neoliberalism and soil erosion. Adherence to the globally dominant neoliberal macroeconomic narrative in South Africa has resulted in fiscal constraints and pressure to accelerate economic growth, while raising concerns that goals of wealth

redistribution and poverty alleviation might be marginalized as interventions focused on backing ‘winners’. Problems identified with the South African soil erosion narrative, which is both historically rooted in South Africa and in non-African historical events such as the Dust Bowl in America, and supported by contemporary institutions such as the Convention to Combat Desertification (UN, 1994), included its anthropogenic focus and its tendency to concentrate on proximal causes of soil loss such as land user ignorance to the neglect of more distal causes. The arrogance of external ‘experts’ led to many mistaken interventions in the apartheid era (due to neglect of local knowledge and important variables; e.g. Clarke, 2002) and continues to threaten the effectiveness of interventions today, although recent South African documentation and expansion of participatory training suggests this may be beginning to change. This research attempted to link micro-scale circumstances in Sekhukhune to these broad scale policy narratives, tracing the structuring impact these exert over local livelihoods and interventions. For example, the national economy and formal job market, fundamentally shaped by GEAR, was found to hugely influence the tightly linked and dependent - through migration-related financial capital flows critical for many purposes including establishing and sustaining local businesses - settlement-level livelihood system.

To address Objective two, a thorough analysis was undertaken of contemporary livelihood strategies in three settlements in Sekhukhune. While the vast majority of households in the study settlements had access to arable land, few produced enough food to survive until the next harvest. Low and unreliable rainfall, parasitic weeds, stalk borers, low soil fertility and the cost of tractor hire all placed severe constraints on production. For the majority of households effective utilisation of NRs was constrained primarily by a lack of financial capital. Rights to utilise *primary* capitals did not necessarily imply that people had the *secondary* capitals, or capabilities, necessary to use them productively. The present lack of job opportunities locally and nationally meant pensions were often the key contemporary income source. Houses without employed members or access to government grants had least financial capital and often also fewest assets and least ability to mobilise them effectively. Yet a small number of entrepreneurs, often ex-migrant workers, were found to have had considerable success in autonomously developing enterprises that generated significant income streams and in some instances also employed other poor people from the community.

While youth expressed diverse aspirations with substantial numbers of respondents interested in working in urban areas also wanting to return to rural areas and even farm in later life, a 'pressure of material needs' may be increasingly hard to resist by young people as images of modernity confront them on trips to urban areas or through television. Many Sekhukhune residents prioritise formal employment as a means of escaping poverty, understandable given the central importance of financial capital to livelihoods, but they are very poorly equipped to capture jobs and few employment opportunities exist in the recently 'globalised' and highly competitive domestic economy. Many respondents felt that government should provide them with services and employment opportunities, but government has contrasting aims; it is seeking to encourage rural residents to become more active in generating their own opportunities and taking responsibility for their own development within a broader context of fiscal constraints on government spending and efficiency concerns linked to neoliberal policy. Yet government is struggling to tackle the 'dependency syndrome' and facilitate job creation. Democracy is perceived to have failed to live up to high expectations of jobs and increased access to services and infrastructure and is seen by some as a destructive force, introducing individual rights but no responsibilities. Democracy arguably remains at risk in South Africa as a result (Lodge, 2002).

Many local people were found to possess a sophisticated understanding of environmental processes such as soil erosion and deforestation, although their perceptions of livestock impact differed markedly to that of many officials, more closely reflecting disequilibrium notions of rangeland ecosystem functioning, and many did not attend to problems of low soil Nitrogen levels. This research focused on soil erosion because it was deemed the largest environmental problem in the district. Local people possessed considerable awareness of soil erosion processes and many implemented simple measures to attempt to reduce soil loss, but for logical reasons, in some instances supported by analysis of biophysical data, they did not view it as a top priority for action. Economic considerations (again reiterating the importance of financial capital), a lack of appropriate technologies, and, especially on 'open access' land, an absence of effective institutional arrangements were found to be critical constraints on land user participation in more intensive and effective soil conservation practices.

To address Objective three, interventions in Sekhukhune for both poverty alleviation and enhanced land management were investigated. Those focused on poverty alleviation are considered first. While the general status of livelihoods in the drier areas of Phahlamanoge and Madibong appeared bleak, some individuals and organisations were found to have achieved considerable ‘success’ in capturing donor funding for income generation projects and/or in generating returns from use of local NRs and skills. The dominant form of intervention in Sekhukhune implemented by external agents was the group-based income-generation project, designed to benefit a greater number of people than would individually targeted efforts. These were supposed to be implemented in a demand-led participatory fashion in order to avoid past problems such as ‘dependency syndrome’, but the micro-scale dynamics of participation were often complex and ambiguous. Case study evidence indicated the critical role played by specific individuals, referred to as ‘development brokers’, who possessed specific kinds of social and human capital, in organising others and capturing the necessary opportunities and resources to initiate income-generation projects within particular settlements.

The major intervention in the region for enhanced land management was the Landcare project in Phahlamanoge, although its aims were multiple (including onsite and offsite beneficiaries and poverty alleviation), somewhat contradictory and in need of prioritisation. The Landcare intervention was motivated by a belief that soil erosion in the area is an urgent problem being driven by a lack of environmental awareness amongst the local population and by poverty. Yet this research indicated that while deforestation, driven by poverty and dependence on local wood for fuel, is perceived by local people to be a problem, many locals had substantial knowledge of environmental processes and did not perceive soil erosion prevention as a priority. There was no evidence that high levels of poverty were driving a vicious cycle of degradation and deepening poverty. The fundamental question of whether or not soil erosion is a problem demanding government action is a difficult one to answer because it impacts on different people in different places in different ways. Biophysical science struggles to assist with addressing this question because the available historical evidence is limited and sometimes contradictory and collection of new evidence on contemporary states and dynamics requires highly intensive, and therefore expensive and time-consuming, site-specific research.

8.3 Implications for intervention in Sekhukhune and beyond

The implications of many of the findings from this research for intervention in Sekhukhune were discussed in the respective chapters where they were described. This section brings together some of the more significant implications of this research and adds value by identifying some specific proposals for Sekhukhune that may also be relevant to other regions with similar biophysical and socio-economic circumstances.

This thesis has argued that increased attention and funding should be given to the development of specific and appropriate technologies, practices and institutional innovations to address the, albeit partly socially manufactured (due to unequal power relations between and within countries), problems of poverty and environmental change in particular localities such as Sekhukhune District. An important and concrete outcome of this research is a list of specific interventions that are suggested as means for reducing poverty and/or vulnerability in Sekhukhune and enhancing peoples' adaptive strategies so that they can lead more secure, prosperous and environmentally sustainable livelihoods (see Table 8.1 overleaf).

The proposals in Table 8.1 are not limited to land-based livelihoods. In Sekhukhune District, as in many other poor and arid areas of developing countries, it is possible that the conditions are such that agriculture cannot be a viable driver for pro-poor economic growth (Dorward *et al.*, 2004). Indeed, livelihoods based on agriculture in Sekhukhune have for a long time been highly marginal in Sekhukhune (cf. Delius, 1996), although there are important exceptions including higher rainfall areas such as Soupiana and the intensive efforts of certain entrepreneurs. The latter demonstrate that whilst options for improving productivity and reducing risk in land use practices are fundamentally constrained by limited supplies of surface and ground water in many areas, it is possible to overcome these obstacles using innovative technologies, practices or just sheer hard work in some instances. However, if regulations on water extraction and payment for water used for commercial purposes are more strictly enforced in future, the viability of these operations may be tested. Moreover, the extent to which these schemes are environmentally sustainable, given potential problems of siltation and salinisation, is unknown. What is certain is that the current scarcity of water in Sekhukhune limits the development of land-based initiatives based on the exploitation of this resource. Non land-based initiatives may therefore deserve increased consideration. Yet both land-

Table 8.1: Proposals for interventions to enhance livelihoods and environment in Sekhukhune

Intervention aim	Description	Potential problems
Enhanced financial management of small businesses	Allocate experienced mentors from commercial enterprises to small businesses to improve management and build networks with suppliers and markets (BUEP, 2003).	Commercial self-interest may undermine approach
Enhanced tree cover	Distribution of tree seedlings and/or support to local nurseries to encourage tree planting	Irrigation requirements of seedlings; theft
Improved water harvesting for vegetable production	Collection of water from roofs using gutters and tanks and/or diversion of yard runoff water to planting pits to enable vegetable gardens within homestead compounds	Lack of rain; cost of materials
Reduced deforestation	Distribution of subsidised fuel and energy saving devices; devolve legal powers and build capacity at local level to manage woodland use and sell permits to outsiders	Cost; culture
Increased arable productivity	Subsidised inputs; research and development of farming practices, crops and technologies based on local and scientific knowledge e.g. prickly pear for own consumption, fodder, saleable jam; 'conservation tillage' methods; irrigation schemes for cash crops (e.g. JICA proposals; Department of Agriculture activities); Marula for own consumption, sale of nuts/oil/beer; integrated pest management/push-pull intercropping methods to reduce stemborer & witchweed; use of within field variability in soil/water/weeds	All marketing ventures are constrained by affordable access to markets beyond the village level where expendable income is very limited; problems of commitment associated with length of time investment is required prior to realisation of returns; scale of irrigation constrained by limited water supplies; sustainability concerns regarding salinisation; cost
Cheap, quality draught power for arable production	Offer affordable access to donkeys or subsidised tractor services and promote greater competition between service providers to ensure good quality service (cf. GTZ rep., pers. comm., 2003; Lahiff, 1997)	Livestock theft; limited dry season grazing; cultural values; perceptions of draught power as out-dated and of donkeys as environmentally destructive
Improved access to financial inputs	Institutional innovations for quicker/easier access to grants; credit/savings groups; public-private partnership contracts for commercial arable production	Limited administrative/financial capacity; corruption; costs; lack of water; exploitation of poor by private sector; land access
Reclaim erosion gullies	Allocate gullies on common land to individual households; form land user groups with fields affected by same gullies to prevent further soil loss by taking collective action higher upslope	Perceptions of costs and benefits
Craft making for income	Manufacture and sale of crafts (e.g. pots, mats) using local skills	Market demand, market access; competition from mass producers
Bees for income	Production of honey for consumption & sale	Market demand & access; ecology
Enhanced livestock production	Experiment with fodder production and stall-feeding systems for increased returns from livestock production	Jackals kill small stock; theft; lack of dry season grazing; lack of rainfall for fodder production
Expand use of arable land	Facilitate use of unused arable plots whilst defending ownership rights of land owner	Social acceptability
Tourism development	Develop tourism potential of Leolo Mtns e.g. Sekhukhune war memorial; hiking; habitat of rare Arum Lilly (<i>Zantedeschia jucunda</i>)	Cost; market demand
Specialised production of cash crops for supermarkets	Assist small producers to adopt new technologies/practices and aggregate outputs to meet cost, quality and quantity demands of supermarket procurement systems, based on success of Montagu Development Trust farm in South Africa; use 'social equity' for marketing (Weatherspoon & Reardon, 2003).	Quality and cost must meet tough standards; requires considerable investments in new technologies and practices for coordination, production, processing, packaging and transportation

based and non land-based interventions for poverty alleviation are limited by a lack of local buying power (besides schools, hospitals, civil servants), at least while job opportunities in the wider economy remain scarce, and by strong competition from powerful and established commercial bodies in markets outside the immediate locality.

Complementary developments, be they land-based or otherwise, must therefore be identified and coordinated in an integrated approach to avoid competition with other interventions or livelihoods, driving down prices and conflict. The fiscal costs of identifying and managing such opportunities and developing appropriate practices and technologies, in cooperation with potential users, while potentially significant, need to be weighed up against the fiscal and social costs of stagnation and provision of safety nets and welfare interventions to large numbers of poor people (Dorward *et al.*, 2004). The discovery that numerous projects, both land-based and otherwise, are struggling to generate income streams for their members in Sekhukhune implies more rigorous assessments of the economic viability of proposed projects prior to allocation of funding would be an essential part of a more integrated approach to rural development, especially since the impacts of failed projects on others in the vicinity was seen to be potentially catastrophic. In the context of such project failures a policy-focus on enterprises initiated by individual entrepreneurs with a proven track record was proposed as a more effective way of boosting economic activity and employment. By drawing on local and/or contemporary knowledge and a range of capital assets, often but not always acquired and used effectively due to substantial stocks of financial capital, entrepreneurs often demonstrated success in generating substantial returns on investments in hostile conditions. In some cases entrepreneurs had also begun employing other local people as their operations expanded. An important implication is that the government focus on 'backing winners' such as 'emerging farmers' in poverty-stricken regions may be justifiable, especially if a necessary condition for an entrepreneur to gain donor funding was the provision of some threshold level of employment generation or training to vulnerable groups. On the other hand, the number of jobs created by such interventions is likely to be limited relative to the size of the unemployed population.

Clearly there is no one panacea for complex problems of rural development, especially given socioeconomic and biophysical heterogeneity. Focusing on assisting

entrepreneurs to enlarge the small and medium sized enterprise (SMME) sector may be one useful strategy for reducing poverty but it must be carefully combined with others, including investment in non-market measures such as social welfare payments and enhanced support to 'subsistence' farmers in low potential areas. How to target and balance specific market and non-market interventions is however a tough question.

The neoliberal narrative demands separation of 'irrational' political decision-making and 'rational' economic spheres, with economics 'experts' making decisions in the latter (Williams & Taylor, 2000). Yet economics, values and hence politics are inextricably intertwined (e.g. Stiglitz, 2002; Williams & Taylor, 2000; Cerny, 1999). This research has shown that environmental problems and interventions also have hidden social and political foundations (cf. Forsyth, 2003). While a narrative of participation in soil conservation initiatives was evident in Sekhukhune, a case study of the Phahlamanoge Landcare project indicated that external agents are not fully recognising local people's knowledge, practices and priorities, leading to limited effectiveness in improving environmental management. More open, inclusive and democratic debate of intervention options and priorities is required, be they related to questions of rural development or environmental management in a specific locality or region, or to broader framing macroeconomic issues, to ensure that the selection and targeting of specific interventions is fully informed, transparent and as objective as possible.

Present attempts at institutionalising participatory practices, for example through the integrated planning process or training agricultural extension workers, may increase the power of the poor. Yet participation by local people is often constrained by government to a focus on local and instrumental ends. Decentralisation of implementation responsibilities to local government authorities or service providers tends to fragment broader-based political opposition that might be able to exert influence directly on central government to improve their material well-being. Moreover, given the heterogeneous nature of communities (e.g. different incentives and preferences for intervention) and the fact that implementing interventions necessarily brings change that can create winners and losers (e.g. Kamara *et al.*, 2002; Ainslie, 1999; Blaikie, 1985), participation may not resolve the contested nature of any 'visions' of what constitutes 'development' or what are acceptable environmental costs. As Simon (2003:26) states,

“Ultimately, the question still boils down to the relative weight to be attached to specific parameters and social groups, and who exercises effective choice”.

Enhanced public participation requires use of experienced facilitators rather than only technical experts, the creation of forums for the debate of broader problems and priorities and inclusion of neglected viewpoints, and more sensitive attention to appropriate formats for ensuring the participation of different groups. Increased efforts to educate people about their rights and responsibilities in a representative democracy may also be important (Turner, 2001). However, problems of defensive attitudes may inhibit the opportunities for a more equal exchange between ‘experts’ and ‘locals’. Moreover, local perspectives must not be romanticised. Increased scientific knowledge of the biophysical implications of current patterns of NR use is crucial if the aim of interventions is to improve the adaptive management abilities of local people and create more *sustainable* livelihood opportunities for poor rural households. The lack of reliable long-term data and hence knowledge of key variables must be fully acknowledged and where possible addressed through intensive site-specific research informed by local knowledge and practices. As Batterbury *et al.* (2001:129) state:

“A more equitable identification of problems ... would allow new agendas to emerge to initiate the collection of environmental knowledge for more development-oriented objectives; plus the greater communication of alternative environmental knowledge to the policy arena... The challenge... is not just to construct a more informed and democratised explanation of externally real biophysical change; but also to ensure this knowledge is used to influence policy at various spatial scales to enable practical and equitable environmental management”.

While consensus on a definition and criteria for measurement of ‘degradation’ or related concepts may not always be possible, within a specific locality where environmental change is thought to be a problem attempts can be made to identify and monitor components of natural capital, or interactions between these components, that provide functions that are currently important to a significant number of poor people’s livelihoods. This approach would have the explicit political aim of better securing the supply of derived utilities for those in greatest need. Moreover, complementary interventions can be made to protect local resources thought to be of potential future use value (e.g. crop biodiversity) and to monitor the emergence of new land use and livelihood opportunities, both in the specific locality and further afield, due for example to changes in technology, climate or market forces. Such changes are important to understand since they may lead to the redefinition of what constitutes critical natural

capital in a particular area and thus which elements of the local environment, if any, require priority for monitoring and management.

Yet even with increased participation and research, it is doubtful whether the whole project-based approach to NR conservation and rural development in South Africa will be able to bring about desired environment and livelihood changes on a landscape scale and at a sufficient pace to match demographic growth due to the tight limits on state funding imposed by the national government's neoliberal economic policy. More commitment from national government and donor organisations to rural development interventions and public sector research is essential to develop new possibilities for more profitable and environmentally sustainable livelihoods.

There is evidently a need to explore intervention options that could enhance government's commitment to the poor. According to Lakshman (2003), good governance in terms of creating and implementing pro-poor agendas relies on three factors. These, their status in South Africa and possible interventions to enhance the pro-poor agenda are summarised in Table 8.2 below, based on findings from this research and supporting literature.

Table 8.2: Three factors for good governance, their status in South Africa and intervention opportunities to improve the pro-poor agenda

Factor	Status in South Africa	Intervention opportunities
Presence of political competition that leads to greater accountability to poor	Lack of political competition in South Africa as ANC is dominant and has no effective opposition, although the press and broadcasting retain editorial assertiveness	Difficult and slow to change as ANC is widely supported due to its involvement in the struggle for democracy and to Africanist advocacy of deference and respect for elders (Lodge, 2002)
Sufficiently high political cohesiveness of the poor leading to the representation of their interests in government	Poor fragmented by patron-client relationships, decentralised local government arrangements and a lack of strong civil society organisations	Federate civil society organisations and forge links with reformist elements within state to increase their voice and influence over government while ensuring they represent the poor (cf. Houtzager & Pattenden, 1999)
Creation and maintenance of a state capacity that is insulated from elite capture and yet 'tied in' to channels for transferring resources to the poor	Local government lacks capacity; government activity is arguably fundamentally influenced by an elite macroeconomic narrative of neoliberalism; civil service is politicised since positions are allocated to favoured individuals (e.g. Lodge, 2002)	Enhance funding and capabilities of local government; assess and where appropriate advocate alternatives to neoliberal policies for growth and poverty alleviation; ensure that civil service appointments are solely based on merit

Source: Research findings and cited literature

Federating groups and building horizontal networks incorporating key civil society and government actors appears to be one means to encourage government to open up policy debates, attend to neglected perspectives and adopt more proactive pro-poor policies that reposition ‘attacking poverty and deprivation’ as the first priority, as it was in the RDP (RDP, 1994). Enhancing the financial support and training provided to local government may be another less radical but no less important means for progress.

Yet the South African government may itself have limited room for manoeuvre, as do many developing countries. As President Thabo Mbeki has acknowledged, the international rules of the game “serve the purposes of our rich global neighbours” (cited in Everatt, 2003:89). Attempts to change international processes, such as removing import tariffs in OECD countries, have the potential to bring perhaps the greatest positive impact on poor rural Africans, in South Africa and elsewhere, but powerful vested interested mean any radical change is unlikely. Nevertheless, efforts at reform and innovative marketing arrangements such as Fairtrade should be expanded as far as is possible (cf. Gabre-Madhin & Haggblade, 2004; Gore, 2003).

8.4 Implications for further research

Some important suggestions for further research related to practical interventions have already been mentioned or hinted at above, for example the need to evaluate the appropriateness of different production technologies and practices for different locations and the need for intensive site-specific biophysical research in areas thought to be undergoing environmental change to better understand and monitor the complex processes involved. Given the lack of time series data in Sekhukhune, as in many developing countries, long-term studies of rangeland dynamics and erosion under different management and rainfall regimes may be especially important for better understanding ‘sustainability’. The impacts on factors such as local agricultural biodiversity (e.g. through herbicide use and/or cross-pollination), soil erosion and yield size (including a full quantification of intercrop yields) of the cultivation of genetically modified crops (e.g. in Soupiana) and their demands on nutrients, water, income and labour, as compared to more traditional cultivars, also require attention in order to understand the benefits and costs of cultivating different crops for different rural households as opposed to purchasing grain direct from retailers. The advantages and disadvantages of different methods of sowing seed is a further topic worthy of applied

research. Such research should be designed in collaboration with practitioners and/or local people and presented in formats tailored to different audiences to ensure that it has practical relevance and maximum impact (e.g. Hovland, 2003; Edwards, 1989).

More research is also needed to better inform debates about macroeconomic policy, both in South Africa and other developing countries. Some researchers claim substantial economic evidence supporting a focus on a 'redistribution with growth' policy as opposed to a neoliberal one has been neglected or ignored by policy makers (cf. Everatt, 2003; Stiglitz, 2002; Pieterse, 2001). This research demands greater attention, investment and follow-up.

Intra-household dynamics have not been investigated in this study. Further research might seek to explore the impacts of participation in certain forms of livelihood such as migration or a group-based project, or changes in cropping practices on the division of labour and benefits to more precisely understand who wins and who loses as a result of different livelihood changes and interventions.

Whether or not research linked to practical intervention is conducted will ultimately depend on the political will of the South African government to alleviate poverty and address environmental problems experienced by the rural poor. Further research could therefore also seek to identify the opportunities for civil society organisations in South Africa to organise, federate and drive a more proactive, integrated, pro-poor policy agenda to replace GEAR, reduce apartheid era inequalities and stimulate job creation. Research on the experiences of groups in other countries such as the highland *quichua* speakers movement in Ecuador which successfully forced land redistribution in the 1960s and 1970s and created large political federations that managed to increase the force and prominence of indigenous communities in national politics (Bebbington, 1993) might also be valuable. Yet the constraints of social movements also require investigation. For example, since individuals of different gender, socio-economic status, livelihood or location tend to have differing priorities, problems of unity and representation often arise (e.g. Forsyth, 2003; Bryant & Bailey, 1997).

8.5 Implications for broader academic and methodological debates

The research presented in this thesis has also contributed to the academic literature on theoretical, conceptual and methodological levels. First, it has argued for and demonstrated the value of a cross-scale, hybrid, historical, mixed methods approach, including micro-scale comparison between settlements and households, for building a robust, holistic, contextualised, yet fine-grained understanding of livelihood-environment dynamics. This research has thus informed methodological and theoretical debates and promoted use of an integrated approach to socio-economic and biophysical analysis. By seeking to uncover both the inaccuracies and social framings of dominant explanations of environmental change and bringing alternative perspectives into view, the research has also challenged “the pretensions of orthodox science to achieve universal accuracy” (Forsyth, 2003:221) and confirmed the need to democratise science and attend to local people’s knowledge, priorities, innovations and practices.

Second, it has devised and used a modified livelihoods framework that contributes to key theoretical debates discussed in Chapter two. The framework emphasises and enables the analysis of the roles played by both institutions and, more unusually, key individuals in shaping livelihood strategies and outcomes. This is important because, as this research has demonstrated, individual development brokers can play a fundamental role in converting the potential inherent in social capital into the capture of development projects and other benefits from donors. A critical implication of this research is that studies of social capital dynamics should attend more closely to the organisational precursors of effective institutions, particularly to building capable agency to mobilise social capital and facilitate and drive social enterprise.

A focus on key social actors, such as brokers and entrepreneurs, is also useful because it breaks down the simplistic categories of state and community, concentrating on the specific actions, strategies and cross-scale network relations of specific capable agents and how these give rise to particular livelihood outcomes in different locations. Therefore, this research affirms the value of actor-oriented and actor network approaches when pursued within the context of a broader multi-scale political economic analysis.

The modified livelihoods framework used here also has significant implications for environmental entitlements theory. The distinction made here between primary capitals (specific stocks or processes from which utility is directly derived) and secondary capitals (stocks or processes that are necessary in order to effectively derive utility from primary endowments) is a constructive development of the environmental entitlements framework. It has been argued in line with Sen (1999) that commodity holdings often indicate little about the nature and quality of people's lives or the vulnerability of their livelihoods to stresses and shocks. While effective rights of access to resources, be they formal or informal, are important to understand, the ability to convert capital assets into capability – an ability that may be constrained by, for example, lack of financial capital or physical disability - is also critical to well being. The framework used in this study emphasises this distinction between effective rights of access to assets and effective use of assets, thus clarifying the importance of two fundamental livelihood foundations that are confused in the entitlements approach.

Third, while this research concentrated on Sekhukhune District the implications for intervention outlined above have relevance far beyond this region, contributing to broader debates about relevant and effective pro-poor growth strategies. For example, the findings are important for wider debates about the contribution of agriculture to rural livelihoods, the contribution of agricultural development to poverty reduction and the best means to promote rural poverty reduction within a context of rural livelihood diversity, difficulties in raising agricultural productivity in harsh agro-climatic conditions, problems with accessing markets and declining world agricultural prices (cf. Dorward *et al.*, 2004:73). It also informs debates about the impacts of rural-urban migration and neoliberal economic policies on rural households. However, the findings should be generalised with caution since, as this research has emphasised, different people in different socio-economic, organisational and biophysical circumstances experience and value livelihood and environmental changes very differently and as a consequence, generalised narratives of change are often highly misleading.

Fourth, this research has highlighted the critical issue of scientific uncertainty, especially with regard to predicting environmental change in highly dynamic dryland environments, and its implications. The experimental scientific approach, which tends to involve experiments that simplify the situation in order to control and isolate a small

number of key variables, can be very useful for more precisely defining problems and understanding different processes (Thomas, 1997), but as the level of system complexity and dynamism increases, so does the scale of the task of comprehension and the level of uncertainty (cf. Scott, 1998; Richards, 1985). If an inability to reliably predict the future in spatially and temporally dynamic and complex dryland systems, at least without extremely intensive site-specific research and monitoring, is admitted, then a shift in approach is encouraged to a strategy of efficiently and effectively responding to changes (Lindblom, 1959). Charles Lindblom (1959) coined the expression, “the science of muddling through”, to capture a practical approach to large-scale policy problems that could not be completely understood. Through a process of limited comparisons, trial and error, revised trials, reliance on experience, educated guess work and rules of thumb incremental progress is made. This approach is arguably similar to the way in which many rural people attempt to learn-through-doing, taking small, often reversible, steps to adaptively manage their land or to make a living through other improvised livelihood activities. Indeed, people living in dryland environments may be the ‘experts’ in this location-specific science of ‘muddling through’ as they have most experience of observing and interpreting early signs, a sense of possible surprises, and hence an ability to adapt more efficiently to changes (predicted or otherwise) in their biophysical and socio-economic environment, even if much of this competence is implicit (Scott, 1998).

Western science can be used to check these judgements and to reveal hidden processes that may not be recognised by local people, thus helping to build site-specific hybrid knowledge of system functioning and strengthen the ability of local people to maintain the buffer capacity or resilience of the system (Ekins *et al.*, 2003; Turner, 1993), but the precision use of such science is a slow, laborious, capital intensive undertaking that may not always be decisive (Scott, 1998). Consequently, there is a need to select which locations and groups should benefit from finite supplies of scientific support, a difficult decision that, like many of the problems discussed in this thesis, is highly political.

Biophysical, social, economic and geographical constraints to realising more secure and profitable on-farm and off-farm livelihoods in remote, dryland regions can be overcome. The degree to which national economic growth is transformed into pro-poor growth in areas like Sekhukhune District therefore ultimately depends on political will.