

Applying the sustainable livelihoods approach in Australian desert Aboriginal development

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Abstract. The sustainable livelihoods approach is widely used in rural development internationally but has been little applied in Australia. It is a framework for thinking and communicating about factors that impact on the livelihoods of individuals and families including their health, well being and income and the maintenance of natural resource condition. The approach aims to promote a systemic understanding of how multiple variables impact on local people's livelihoods. Three case studies are outlined, that highlight its potential as a tool for collaborative engagement of researchers, local people and other stakeholders, to promote sustainability of Aboriginal livelihood systems in remote desert Australia and to contribute to improved understanding of the dynamics of regional socio-ecological systems.

Additional keywords: assets, disadvantage, indigenous, institutions, native food, vulnerability.

Introduction

The 'sustainable livelihoods' approach is central to international effort in rural development, poverty reduction and environmental management but has been sparingly applied to Aboriginal development in Australia. We are interested in the extent to which this approach can aid understanding and illuminate opportunities for new livelihood systems, including both policy dimensions and local strategies that are adaptive and resilient to the ongoing risks and vulnerabilities faced by desert Aboriginal people and the regions where they live. Here, we use the sustainable livelihoods approach as a research heuristic, as the basis for systems modelling, as a tool for collaborative planning by families and communities, and for improving cross-cultural communication. We are finding that it has value in promoting a systemic understanding of the linked social, cultural, economic and ecological issues that impact on Aboriginal development in desert Australia. We conclude that it has strong potential to provide a sound framework for identifying effective pathways that will impact positively on Aboriginal disadvantage and for monitoring change, provided it is applied flexibly and collaboratively.

Widespread social crisis among desert Aboriginal people (Wild and Anderson 2007) and climate change forecasts (CSIRO and Australian Bureau of Meteorology 2007) provide a pressing context for our work. Compared with other Australians, Aboriginal peoples' health is poor across Australia. Some analyses (e.g. Cass *et al.* 2004 but cf. Scrimgeour 2007) conclude it is worst for the Aboriginal people that inhabit the 70% of Australia that is arid and semi-arid, that is 'desert Australia'.

Together with Indigenous people of other remote regions of Australia, desert Aboriginal people have the highest incidences of family violence and assault, much of it associated with multiple stressors that often include alcohol use (Al-Yaman *et al.* 2006). Poverty is entrenched among many families. One indication is the finding by Mitchell *et al.* (2005) that the average income of Aboriginal residents of Alice Springs, the main service town in central Australia, is 33% that of non-Aboriginal residents and that income disparity is even greater among residents of the surrounding region.

Multiple cross-cultural and cross-sectoral issues are encountered by initiatives that seek to address this disadvantage. These issues readily extend beyond social domains and into ecological domains because Aboriginal property rights are now very widely recognised in desert Australia (Altman *et al.* 2007), and the majority desert population outside service and mining towns is Aboriginal (Brown *et al.* 2008). Hence, decisions about land use and strategies for sustainable land management across very large parts of Australia are strongly influenced by Aboriginal aspirations, institutions and behaviours, and the impact on these of policies and programs aimed at overcoming Aboriginal disadvantage.

Our applications of the sustainable livelihoods approach and framework to desert Aboriginal development originated in conclusions drawn independently by Fisher (2002; CAT no date) about use of the approach as a model of community development practice, and by Stafford Smith *et al.* (2003) about use of the approach to improve understanding of the dynamics of regional

socio-ecological systems. Fisher drew on his international experience in the use of the sustainable livelihoods approach to argue its relevance to the key issue for the future of Indigenous people living in remote Australia: 'How [they might] achieve greater well-being, reduce their vulnerability and thrive within an Australian society of vastly contrasting social and economic characteristics' (CAT no date, p. 1). He argued that there was little understanding among support agencies of the aspirations of remote Aboriginal people, and very little attention to sustainability when agencies make investment decisions affecting remote settlements. Fisher proposed that applying a sustainable livelihood approach in partnership with remote communities would greatly improve understanding of the complex factors that impact on settlement viability, bring greater rigour to investment decisions, and promote community members' capacity to express and work towards the outcomes they are seeking.

At a broader scale, Stafford Smith *et al.* (2003) argued that better tools are needed to understand remote Australian regions as dynamic socio-ecological systems. One significant reason is that investments in one sector have often ignored impacts on other sectors and that the net benefit for regional development has been reduced as a result. Another reason is that non-market values, such as cultural relationships of Aboriginal people to land, are relatively more significant in contemporary remote Australia than they are in more populated regions. Such non-market values confound standard economic analyses of options for regional development. As one starting point for more effective decision making for ecologically sustainable development in remote regions, Stafford Smith *et al.* (2003) drew attention to the 'five capitals' asset model used in the sustainable livelihoods approach. They recommended using this model to structure analysis of the influence of different social groups on decision making in remote regions and to inform how regional models of socio-ecological systems might best account for interacting interests.

In this paper we outline three case studies of research projects in desert Aboriginal Australia in which the sustainable livelihood approach has been applied as a direct or indirect result of these recommendations, and we discuss lessons from this experience. First we outline the origins of the approach and the features that allow it to be applied as a conceptual systems model.

The sustainable livelihoods approach

The sustainable livelihoods approach is widely used among international development agencies, particularly those active in Asia and Africa in planning, reviewing, and evaluating projects, as well as researching, analysing, and developing policy (Cahn 2002). It incorporates and summarises much of what is considered 'best practice' in development (Hussein 2002). The approach is most widely applied to design and support development interventions among poor and disadvantaged rural people. However, the concept of a sustainable livelihood is applicable much more widely (Singh and Gilman 1999).

In the sustainable livelihood approach, the definition of a livelihood is broader than a job, business enterprise or other means through which people gain financial income or material support. The approach recognises that health and well being outcomes and associated environmental factors such as natural resource condition are important to the quality of people's lives as

well as financial income; that people draw on diverse assets and use multiple strategies to provide for their needs; and that available strategies are determined by social, political, ecological and other factors in the broader environment.

A livelihood is defined as comprising 'the capabilities, assets and activities required for a means of living'. Assets are defined as stocks of resources of different kinds, and the claims that people make to these. A livelihood is said to be sustainable 'when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base'. This definition, derived from Chambers and Conway (1992, p.7), Scoones (1998) and other writers, has been widely adopted in international rural development research and practice, notably by the United Kingdom Department for International Development (UK DFID), the United Nations Development Program (UNDP), Oxfam and CARE (Cahn 2002).

Origins

The origin of the sustainable livelihoods approach was in debates and critique over environment and development in developing countries. Mainstream development thinking was criticised as being dominated by 'things' instead of 'people' and as tending to promote 'the rich' instead of 'the poor', 'men' not 'women', and 'numbers' instead of 'qualities' (Chambers 1987). Chambers and others argued that the conventional economic focus on market production, salaried employment, and cash income as the key elements of well being was ethnocentric, reductionist and inadequate to account for the strategies people actually use to obtain a living (Chambers and Conway 1992). Rather, people pursue livelihood security in many ways: 'through ownership of land, livestock or trees; rights to grazing, fishing, hunting or gathering; through stable employment with adequate remuneration; or through varied repertoires of activities' (WCED 1987). Chambers and Conway (1992) stressed the need to recognise the often transient, mobile, dispersed, and diverse nature of such activities when pursued by poor people and the importance of reflecting local conditions, priorities, and beliefs in approaches to development.

These perspectives were allied with emerging global concerns for ecological sustainability in the 1990s to underpin participatory approaches to sustainable development that recognised the practical role and expertise of local and indigenous knowledge and challenged 'expert' wisdom that poor people always degrade their natural environment (de Haan 2000). Contemporary understandings of livelihood systems show how human societies, their cultures and economies, emerge from the constraints and possibilities offered by their environment. Local and indigenous knowledge systems develop from shared experiences and management practices, and are integrated with moral and spiritual beliefs derived from particular ecological settings (Berkes and Folke 1998). Adaptations to local environments are embedded in this knowledge and in values, beliefs, skills and attitudes shared across a group of people (Batterbury and Forsyth 1999).

The sustainable livelihoods approach is not a measure or test of sustainability. Rather, it is a tool or way of thinking designed to assist in identifying changes that can be made to institutions, to people's assets or their strategies in order to promote the

resilience of local livelihood systems. In doing so it may highlight factors that constrain or enhance the sustainability of these systems. The approach focuses on the capabilities and strengths of individuals, families and households, rather than their needs or desires or their deficits. Ellis (2000) concludes that it is also valuable in building understanding of how various factors outside the control or influence of poor people affect their access to different types of capital, opportunities and services, and hence their capacity to pursue strategies that will return outcomes they aspire to. Such factors include legislation, policy, local rules, cultural norms and other institutions as well as risks and uncertainties associated with climate or with market conditions. Many of these factors reflect power relations and a historical–political–cultural context which, in Australia (Sutton 2001) as in developing countries (Murray 2002), must also be understood if opportunities and outcomes for poor and disadvantaged people are to change.

Conceptual systems model

The various elements of a livelihoods system and their inter-relationships are represented diagrammatically in the sustainable livelihoods framework (Farrington 2001). The diagram developed by UK DFID (1999–2001) is widely used (Fig. 1). Practitioners have adapted this diagram to suit various settings (see Hussein 2002). Figure 2 shows a generic representation of key factors common to most representations of the sustainable livelihoods framework.

The framework identifies five basic categories of capital assets that people may draw on in pursuing livelihood strategies: natural, social, human, physical or manufactured, and financial. This categorisation is also advocated in broader models of accounting for sustainability (e.g. Porritt 2005). Its use in the sustainable livelihoods approach emphasises that, whereas increasing people's incomes reduces poverty, reducing vulnerability requires an improvement to net assets (Arce 2003). Bebbington (1999) comments that different mixes of and degrees of substitution among the different types of capital asset provide inputs to people's livelihood strategies, while these assets also represent the outcomes that characterise people's lives. Human

capital includes knowledge, skills and health. Social capital includes networks and relationships within and beyond the local context.

The sustainable livelihoods framework promotes a systems perspective, drawing attention to the dynamic nature of interactions between people's assets, their decisions about livelihood strategies, the factors that enable or constrain those decisions, and the outcomes for their lives. Outcomes from a sustainable livelihood system, such as those indicated in Fig. 1, extend people's asset base and reduce their risk or vulnerability to shocks, which may include life events such as death of a household member or global trends such as climate change.

The key role of 'transforming structures and processes' (Fig. 1), or 'institutions' (Fig. 2) in achieving sustainable livelihoods is indicated by their central place in these diagrams. Institutions comprise rules, norms and shared strategies, whether developed locally and embedded in culture, or formulated at other levels in legislation and policy (Ostrom 2005). These determine both the livelihood strategies that people are able to pursue, and their vulnerability to shocks and stresses. The sustainable livelihoods framework also accounts for entitlement and human capability (Sen 1983) by locating the 'influence' that people have on institutions as mediating between 'assets' and 'institutions'.

The framework highlights critical feedbacks between 'institutions' and the 'risks' that people face (Fig. 2) or their 'vulnerability context' (Fig. 1). In this way the framework is able to account for factors that Reynolds *et al.* (2007) synthesise from a diverse array of research on desertification, vulnerability, poverty alleviation and community development: that vulnerability involves multiple stressors at various spatial and temporal scales, and emerges from the interactions between social actors, the environment and institutions.

Critiques from practice

Community development analysts have criticised the sustainable livelihood approach as technocratic and driven by agendas external to communities (Brocklesby and Fisher 2003), notwithstanding its origins in advocacy and in empowerment of

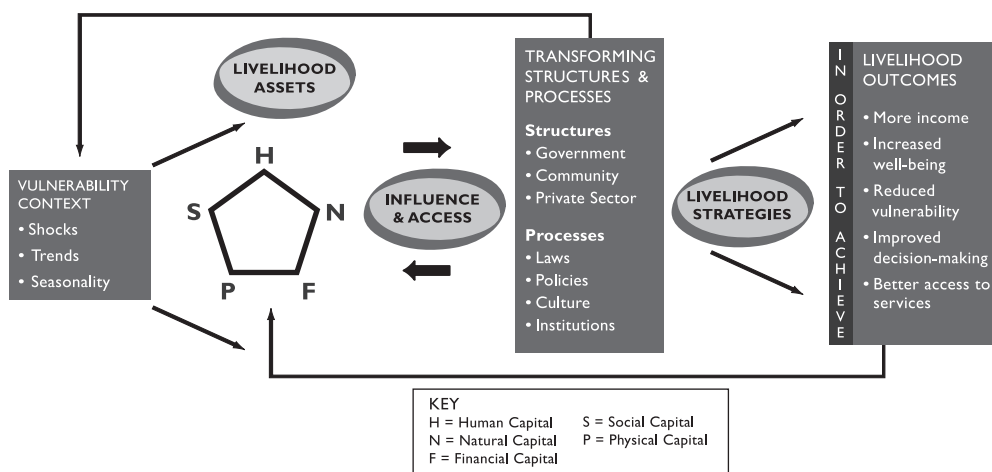


Fig. 1. UK DFID sustainable livelihoods framework [Source: CAT no date; UK DFID (1999–2001)].

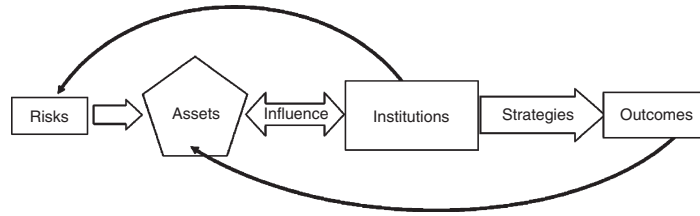


Fig. 2. Generic sustainable livelihoods framework.

the poorest sectors of communities. Critics also argue that by compartmentalising or ‘boxing’ human and social capital, the approach is limited in its potential, since it does not do justice to the interface of diverse knowledge systems (Arce 2003). Lessons from practice suggest the approach must be used with other tools and modes of analysis if it is to take account of the complex issues associated with power relations, contestation over assets and the differences among people in values and culture, factors that typically shape the differential livelihood opportunities for different people in a community or region (e.g. Lovell *et al.* 2002; Maru and Woodford 2005). Further, if analysis of livelihood systems is to support improved outcomes for poor and disadvantaged people, it would be a mistake to ascribe too much agency to those people. It is unrealistic to expect poor people to apply their assets more effectively to strategies that change outcomes for their lives as poor people simply have few assets to juggle. Institutional change is invariably needed to increase the range or nature of livelihood strategies available to them, and this requires supportive action by other people. We have sought to be responsive to such critiques in our various applications of the sustainable livelihoods approach to desert Aboriginal livelihoods.

Desert Aboriginal livelihoods

Classical Aboriginal livelihood systems were closely adapted to key environmental drivers characteristic of deserts, as described by Stafford Smith (2008, this issue). These are high variability in rainfall, widespread low fertility with patchy distribution of more productive environments, and sparse human populations. Desert Aboriginal people’s responses to variations in resource variability over time involved strong investment in institutions rather than in physical assets. Their societies embedded processes that managed for vulnerability to temporal and spatial variations in resource availability.

People harnessed human capital – intimate and private knowledge of their own country and its waters. Social capital – ‘multiple long distance kin sharing networks’ (Gould 1982, p. 73) – was fundamental to their livelihood systems. Mobility was a key livelihood strategy enabled by social capital and by strong customary law institutions – multiple bases for entitlement to access resources coupled with protocols requiring permission to access other people’s country for resources, complex classificatory relationships locating all members of society in relationships to each other and to resources, norms of reciprocity, sanctions for transgression and long distance trade networks. These characteristics are exhibited to some extent across all Aboriginal peoples in Australia but most strongly expressed among desert peoples (Bird Rose 2005), arguably because of desert drivers.

In contemporary desert Aboriginal societies, institutions originating in customary law and cultural norms co-exist with government laws, policies and programs that support the welfare of citizens through social security entitlements and health and education services, recognise Aboriginal customary rights to land, and aim to foster Aboriginal social and economic development. Customary institutions have evolved under such influences in a way that elaborates and reinforces intra-group Aboriginal social relationships and fosters Aboriginal dependence on government. Folds (2000), for example, argues that Pintubi Aboriginal people have brought the ‘government’ into their kinship networks in such a way that the government’s obligation to provide for them is a natural and expected part of the relationship, replacing work or other productive activity as a livelihood strategy. Austin-Broos (2006) argues that Western Arrernte Aboriginal people draw on cultural structures of ‘relatedness’ to adapt to structures imposed on them. She observed that relationships that were sustained by production in classical Aboriginal societies are now sustained by a circulation of material resources sourced largely from welfare payments, and that maintaining this circulation constitutes contemporary Arrernte understandings of ‘work’.

Although we agree with Rennie and Singh’s (1996) observation that sustainability of livelihoods can prove a difficult criterion to agree on in practice, we consider that the contemporary livelihoods of most desert Aboriginal people are very clearly unsustainable. The situation of prevalent poverty and poor health that we outline in our introduction indicates that the kinds of social and economic outcomes that should be generated in a sustainable livelihood system (Fig. 1) are far from being achieved. Further, even though the extensive desert regions that are in Aboriginal ownership remain relatively ecologically intact (UNEP 2006; Altman *et al.* 2007), when desert Aboriginal people apply their own indicators to natural resource condition, they often conclude that their lands are degraded (e.g. AWS 2005).

Since 2004 the Australian government has focused on three interrelated and urgent priorities in addressing the national challenge to improve the quality of life of Aboriginal people: early childhood intervention, safer communities and building Indigenous wealth, employment and entrepreneurial culture (MTF 2004). The sustainable livelihood approach has potential value in supporting these directions, particularly the latter, because of its focus on supporting disadvantaged people to use such means as might be readily available to them to generate wealth. However, unlike the dominant emphasis in government policy, the approach assesses wealth broadly, encompassing different classes of assets, rather than only financial or material wealth.

Applying the sustainable livelihood approach in desert Australia

The case studies presented here describe research that applies the sustainable livelihoods approach to understand and support the development of more sustainable livelihoods for Aboriginal people in remote regions of desert Australia. As indicated in Figs 1 and 2, the various elements – such as assets, institutions, strategies and outcomes – that impact on the achievement of sustainable livelihoods are dynamically linked as part of sustainable livelihood systems. We have found that any of these elements can form a starting point for building a systems understanding. To illustrate this point, each of the case studies starts from a focus on one element of the system. Each also operates at a different social scale. The Engawala case study focuses on assets in a remote settlement; the Anmatjere case study is concerned with issues at the scale of a small region and focuses on institutions. The starting point of the bush foods case study is in the livelihood strategies of individuals and families.

Understanding assets at Engawala

Engawala is a central Australian settlement located 200 km north-east of Alice Springs. It has a population of 130–160 Eastern Arrernte people. Most residents belong to one of two main family groups who maintain cultural rights and responsibilities for the land. The settlement is situated on an Aboriginal owned cattle station. The membership of the cattle station corporation consists of both residents and non-residents of Engawala.

From June 2005 until July 2007 the Centre for Appropriate Technology undertook a project to enhance the livelihoods of people living in Engawala. The project worked with the Engawala community using a participatory action research approach (Gilmore *et al.* 1986). During this time, residents were engaged to help with data collection, thus, engendering a shared understanding between them and the research team, producing interpretative insights and a dialectical learning process over the term of the project. This case study draws on a few of the findings from the project. Moran *et al.* (2007) present a fuller account.

The study had begun with a proposal to measure flows of material resources within the community on the assumption that these measurements could be used to support residents to assess livelihood options in relation to their asset base. However, other criteria were found to be equally meaningful to Engawala people, particularly those related to maintenance of culture and spiritual connections to land. The acquisition of the cattle station provides an illustration of this. The cattle station has provided limited opportunities for employment and profit and it continues to be managed by an employee from outside the community. To the community, the most important aspect of the Aboriginal ownership of the cattle station is that it facilitates people accessing their land for cultural purposes. As this example illustrates, regardless of financial outcomes, the people who live at Engawala do so because they consider that only there can they produce and maintain a set of cultural practices. This set of cultural practices is dynamic and is conceptualised as underpinning all aspects of livelihoods at Engawala.

The asset pentagon (Fig. 1) was the starting point for collaborative work in the project. Lists of assets were written down and uses of these assets within the community were

observed and described. The information provided a unique understanding of relationships that Engawala residents have within their region and how residents engage with extended family, other family groups, other settlements and service centres. Importantly, it showed that regional spatial connections are influential in decisions made by the community and by households. The information also helped in understanding the Engawala asset base and the transformations of assets in livelihood strategies. However, efforts to quantify these factors were problematic particularly since measurements of assets and resource flows at the settlement level were often too general to be useful at an individual, household or family level.

The research team also worked through other aspects of the sustainable livelihoods framework with residents, using focus groups and community meetings. A collective approach was taken because almost all the vulnerabilities experienced by individuals at Engawala were also experienced collectively. Engawala residents consider their vulnerability to environmental factors, such as variable rainfall, to be less important than the relationship the community has with government. The basic needs of a majority of the residents in Engawala – such as housing, water supply and cash income – are supplied by the Australian state. Hence, vulnerability in Engawala is inseparably intertwined with securing government funding and services through external institutions largely beyond their influence.

In considering social capital Engawala residents distinguished between relationships with family and relationships with government. The former, particularly networks of extended family and other kin, are people's key asset for enhancing resilience in relation to short-term vulnerabilities to external institutions. The latter are part and parcel of the local governance institutions that bridge between external institutions and cultural change processes, and that afford Engawala residents their greatest opportunity to participate in, influence and control decisions affecting their livelihoods. The distinction that residents presented was so persuasive that the framework diagram was rearranged to reflect this (Moran *et al.* 2007).

The sustainable livelihood approach worked best for the settlement level application in Engawala when used as a participatory model of practice, to draw both outsiders and residents into an intercultural field in which knowledge sharing and innovation towards achieving livelihoods outcomes are possible. This approach required intensive field engagement and the work continues. In this example, the framework was not useful as a theoretical model to undertake a comparative analysis of assets, nor was it useful for measuring the resource flows.

Institutions for sustainable livelihoods in Anmatjere region

The Anmatjere region is 200 km north of Alice Springs straddling the Stuart Highway. Aboriginal people comprise 78% of the population of ~2000. Discussions with a diverse range of people from the region during a scoping study in 2004 identified unemployment to be a major issue impacting on the prospects for sustainable regional development. Up to half the people in some settlements are unemployed (NTG 2003) even though there is unmet demand for labour, particularly in the expanding horticultural industry.

The research in this case study is directed at understanding factors that contribute to explaining the co-existence of high numbers of unemployed people and high numbers of available jobs. The aim is to inform the design of interventions aimed at increasing local employment and hence to impact positively on regional sustainability. The sustainable livelihoods framework is being used in this research because the concepts it introduces, such as livelihood strategies, were found during the scoping phase of the study to be more appropriate than concepts such as 'jobs' and 'wages' to the highly seasonal pattern of work in the region's primary industries and to the diverse array of responsibilities for care of land and people that engage many local people (Measham *et al.* 2006).

The study interviewed more than 50 Aboriginal residents of four settlements close to the Stuart Highway, as well as managers of several horticultural and pastoral enterprises and staff of some local agencies. Interviews were directed at understanding people's aspirations, livelihood strategies and the impact of both formal and informal institutions in determining which strategies people engage in. Interview questions were structured to explore various elements of the sustainable livelihoods framework but the 'language' of the framework was not used directly by interviewers. Interview data is informing the design of a systems model which will be developed with participation of key local stakeholders. Modelling aims to provide a basis to scale up findings from field research to account for how differences in values and in the influence that various stakeholders have on formal and informal institutions impact on livelihood outcomes. A steering committee representing key local and regional agencies is an important conduit for adoption of findings and facilitating institutional change.

Preliminary findings from the research suggest that social capital is the most important asset that is engaged when local Aboriginal people make decisions about livelihood strategies. A key example of this is that many Aboriginal people reported that they began to work in a particular job, or to undertake particular activities in care of land and people, because they were nominated or 'picked' by someone else as the person who should do that job or role. They often then participate in education and training, whether in formal courses or not, to build their skills and knowledge for the job or role. This pattern appears to reverse the standard mainstream 'job-seeker' model in which unemployed people are expected to survey the landscape of available job and training opportunities, choose an opportunity that meets their aspirations and is compatible with their skill set, and then be accepted or not by the employer. Instead of uptake of particular livelihood strategies being transacted on the basis of human capital (knowledge or skills), it is transacted on the basis of social capital: people with influence over other people and over particular jobs or roles facilitate and mentor the entrée of others with less influence or motivation into these jobs and roles.

Indications are that this facilitation operates in a large part, though not exclusively, through extended family networks. This should not be surprising given the importance of social capital, particularly extensive kinship networks, in desert Aboriginal societies. However, the number of unfilled job vacancies suggests that these networks are not operating as effectively as they might. The relative role of these networks compared with other factors that impact on engagement in the labour market, such as transport,

education, skills and competing demands for individuals to invest time into other activities, is being further explored in the Anmatjere region through participatory systems modelling. This is expected to contribute further in future to understanding how application of the sustainable livelihoods approach and its conceptual systems model at a local scale can contribute to sustainable regional development.

Bush food livelihood strategies

The third case study research project is using the sustainable livelihoods approach to expand understanding of socio-cultural issues around Aboriginal people's involvement in the emerging bush foods industry in Australia's desert regions. It is identifying fresh ways for Aboriginal people to achieve maximum benefit at minimum cost as part of ensuring the development of a fair, equitable, and sustainable industry that provides secure livelihood strategies for those desert Aboriginal people interested in bush foods.

Most of the produce supplied to the emerging 'Australian native food' industry from arid and tropical species comes from bush harvest. In recent years 70% of desert tomatoes (*Solanum centrale*) and up to 100% of the various kinds of wattle seed (*Acacia* spp.) used to produce foods and flavourings have been sourced from the harvest of wild-growing plants in central Australia. Harvesting of these plant foods for commercial return has been occurring for ~30 years in central Australia. It is conducted mainly by middle-aged and senior Aboriginal women. An estimated 300–500 people have been involved in the commercial harvest over the last 5 years (J. Douglas and F. Walsh, personal communication). However, irregular rainfall means that supply of bush harvest produce from central Australia fluctuates. Feral animals, introduced plants and changed fire regimes are also impacting on production from some species (Latz 1995). The impact of uncertain supply on the growth of the industry is stimulating horticultural production of bush foods in desert Australia, some of it by or in partnership with Aboriginal people.

In spite of their long standing involvement in the collection and sale of raw produce, very few desert Aboriginal people are involved in other roles in the value chain of the national native food industry. The industry is dominated by non-Aboriginal horticultural growers, business people and researchers. Most research has focused on product development, quality enhancement, and the anticipated economic and ecological benefits of industry development in southern Australia, where almost all production is through horticulture by non-Aboriginal growers (Graham and Hart 1997; Nagy 1999; Ryder and Latham 2005).

This research involves interviews and workshops at several desert localities with Aboriginal people who are engaged in commercial use of native plants. Contextual descriptors drawn from the sustainable livelihoods approach aided initial field site selection and are guiding the data collection. Key variables contributing to positive and negative livelihood impacts from involvement in the industry on individuals, families and communities are being identified across study sites with the aid of a matrix based on work by Belcher and Ruiz Pérez (2001).

The research is finding that desert Aboriginal individuals and families are using various strategies in an effort to engage in and benefit from this industry. Strategies include localised

development of food and therapeutic products and accessing local and specialised sales outlets such as community stores, art centres and market stalls at regional festivals. People are pooling skills and expertise, and are using kinship networks to build a stronger skills base for their enterprises. They are often engaging part time in enterprise and looking to expand their time commitment as markets grow. Some are actively involved in development of protocols that they hope will support protection of Aboriginal cultural property in native plant species. Many emphasise the strong cultural basis of their products and services in their interactions with customers and the broader community, seeking to foster cross-cultural respect and understanding. Aboriginal people who are engaging in horticultural production from local plant species continue to engage in bush harvest as a strategy to facilitate intergenerational transfer of traditional knowledge of the plants and for domestic food production.

Workshops and discussions with Aboriginal people engaged in these strategies have concentrated on the major benefits and costs of industry involvement for various kinds of livelihood assets. At one workshop a community based researcher introduced the five 'standard' classes of assets (Fig. 1) to stimulate and guide discussion. However, the diagram of the 'assets pentagon' was not used in the discussion and participants were encouraged to draw on their own experiences and understandings of assets. The collaborative approach had the effect of including participants as researchers of their own livelihood systems, and facilitated in-depth discussion of a broad range of livelihood and well being impacts on individuals, their families, and communities. Participants said these discussions were valuable in helping them to clarify the outcomes they want for socially and culturally appropriate involvement in the industry, as well as highlighting potential barriers to achieving these.

The major benefits of bush foods industry involvement that participants identified relate to socio-cultural and human assets. Industry involvement has been increasing respect, support, and acknowledgment within participants' own families and among both Aboriginal and non-Aboriginal community members. Participants have been learning new skills through involvement in the industry as well as sharing their customary knowledge of plant species. Sharing of what participants emphasise as 'our knowledge' is an important contributor to the increased sense of pride and self-esteem that has resulted. Participants aspire to retain ownership of the knowledge that has been passed to them from their parents and grandparents as a human and social capital asset and to share it on their own terms. Workshop discussions thus indicated that participants' spiritual and emotional well being is strongly related to the ways in which the institutions that structure the native food industry impact on this knowledge.

Several issues limit participants' capacity to sustain their involvement in the industry. These include lack of physical assets, notably vehicles, and low returns on financial investment, particularly for those involved in horticulture. Human capital issues include high turnover of workers in enterprises and an associated loss of technical skills and motivation. Lack of support for the efforts of entrepreneurial individuals among their own Aboriginal community, Aboriginal organisations and their staff indicate limited social capital. Participants also identified continuing risk to cultural assets – Aboriginal traditional knowledge and cultural property in plants – from industry

development, particularly with establishment of horticultural enterprises. This is because, compared with bush harvest, horticulture downplays the role of knowledgeable elders, and may lead to harvesting trips to traditional country no longer being seen as necessary or important, especially by young people.

Discussion

These case studies outline research projects that are applying the sustainable livelihoods approach to a range of issues and scales. Here we discuss what the three case studies indicate about the value of the approach as a tool for improving community development practice, as proposed by Fisher (2002) and CAT (no date), and to contribute to enhanced understanding of the systems dynamics of remote regions, as proposed by Stafford Smith *et al.* (2003). The Engawala and bush foods research originated directly or indirectly in the former proposal and the Anmatjere research had its origins in the latter proposal. Only the Engawala project has been completed, so findings are necessarily preliminary.

The Engawala project found that the systems perspective encoded in the sustainable livelihood framework (Fig. 1) was a valuable starting point for researchers and local participants to communicate about culture, about different forms of vulnerability, and relationships with government. Nonetheless, the framework diagram needed to be rearranged to reflect the Engawala settlement-level livelihood system in a way that was meaningful to local people. Modifications to the way that a sustainable livelihood system is depicted in diagrams and models are likely to evolve in any participatory local engagement because, in order to promote engagement and their own understanding of local contexts, researchers need to use the framework flexibly, as a way of thinking, rather than as a rigid prescription. However, we consider that the generic framework (Fig. 2) has value as a conceptual model of livelihood systems.

One of the conceptual and practical difficulties encountered in each of the case study projects has been how to best account for culture in the analysis of desert Aboriginal livelihoods and of opportunities for more sustainable livelihoods. Culture may be considered as a separate class of capital asset (e.g. Throsby 1999), additional to the 'five capitals' commonly identified in the sustainable livelihoods approach. The Aboriginal arts and crafts industry is the most significant example of remote Aboriginal people using culture as a livelihood asset to generate income, among other outcomes. In the bush foods case study desert Aboriginal people are engaging culture as an asset when they emphasise cultural attachment to and traditional knowledge of plants in local marketing of their products and services.

However, we consider that accounting for culture only as a category of asset does not do justice to its significant role. Culture is also the locus of the human and social capital that allows people to innovate and adapt to changes in their environment, and of norms and rules that shape the acceptability of livelihood strategies among local people. Even though globalisation and migration continues to blur relationships between cultural practices and particular biophysical environments, cultural specificities that reflect local places, landscapes and resources continue to exert powerful influences on the ways that people behave (Bebbington and Batterbury 2001; Escobar 2001). Hence, rather than being only accounted for as a class of livelihood asset, culture is better characterised, as the Engawala case study

found, as a factor that influences all elements of livelihood sustainability.

Action research and participatory planning have been used in the Engawala and bush foods studies to promote empowerment. Effective use of the sustainable livelihoods approach to facilitate changes in the way local people behave almost certainly requires participatory processes and strong local collaborations. These are important for generating shared understanding between local people and researchers and facilitators about those factors within the control of local people that are amenable to change, and motivation to make such changes. However, the sustainable livelihood approach is also widely used internationally to analyse the effectiveness of policy and to design new programs. The Anmatjere case study is an example of such an application, being aimed at understanding key dimensions of local livelihood systems relatively quickly in order to identify institutional changes that are likely to enhance outcomes.

Participatory processes require 'concerted, sustained determination' (Wolfe 1993, p. 43) if they are to make a positive contribution to improved quality of life for Aboriginal people. This has implications for the time and other resources that need to be committed to applying the sustainable livelihoods approach. However, these resource needs are little different to those required for any other style of community development process. The added value that the sustainable livelihoods approach brings is in presenting a systems model that is able to account for ecological as well as social and economic assets and outcomes, for local as well as outsider world views, and for transactions and outcomes that are difficult to express in monetary terms, including those motivated by culture. These are important advantages for Aboriginal development in remote desert Australia because in these regions the extent of Aboriginal property rights means that outcomes for ecological sustainability are strongly influenced by Aboriginal behaviours and decisions.

The Engawala case study showed that the sustainable livelihood framework was not useful as a tool to measure the asset flows or resource movements in remote settlements. Measurement is a key concern of governments and yet is confounded by a multiplicity of factors including understanding what to measure, and what the factors that are measured as inputs and outputs from a development intervention actually tell us about outcomes. In the Anmatjere research, inherent uncertainties that affect measurement of the impact that people's opportunities, choices and decisions have on their engagement in particular jobs or roles are being addressed by a modelling approach based on Bayesian statistics. This method assigns 'subjective probabilities' derived from qualitative data to causal relationships between variables overcoming the need for precise measurement (Charles River Analytics Inc. 2004; Alexandridis and Measham 2007).

Internationally, application of the sustainable livelihood approach has been intrinsically linked to diversification, by necessity or by choice, to reduce the vulnerability that people face in situations where they are overly dependent on a single livelihood strategy (Alexandridis and Measham 2007). Contemporary Aboriginal livelihoods that are adaptive to 'desert drivers' (Stafford Smith 2008, this issue) are also likely to involve a diverse set of strategies. Natural and cultural resource-based products such as art, bush foods and store cattle, and services in natural resource management and tourism provide opportunity for

diversified production by desert Aboriginal people from their traditional lands. They tend to appeal to Aboriginal people because they are considered to contribute to 'keeping culture strong'. However, commercial returns from such activities are not likely to significantly impact on desert Aboriginal people's dependence on financial transfers from more populated regions of Australia to pay for community services and settlement infrastructure, particularly since variability in rainfall leads to considerable fluctuations in supply of products and demand for services.

One way forward is to reconstruct the notion of 'production' by Aboriginal people to encompass not only conventional goods and services, but also the improved outcomes for their own health and well being and for maintenance of ecosystem services that are generated by their engagement in production of natural and cultural resource based products and services (Burgess *et al.* 2005; Campbell *et al.* 2007). Such alternative 'production' could potentially have considerable appeal to 'markets' in sectors of government and society concerned with overcoming indigenous disadvantage. In other research (e.g. LaFlamme 2007) we are addressing the challenges that engagement with these 'social markets' presents by establishing how livelihood outcomes sought by desert Aboriginal people relate to those sought by governments, and identifying effective outcome indicators.

Seasonal or cyclic migration to places with strong labour markets is a common mode of diversification internationally. Experiences in the South American Andes (Bebbington 2000), at least, are that this has supported indigenous and local cultures rather than being destructive to them, as a result of investment by migrant workers back into their local communities. However, although many desert Aboriginal people do migrate cyclically between remote settlements and larger towns which have strong labour markets (e.g. Long and Memmott 2007), there is little indication that this is for employment. Further, as the Anmatjere case study indicates, local labour markets are strong in some desert regions with high Aboriginal populations, but they do not engage Aboriginal people very effectively.

Indications from the Anmatjere region that family and kinship networks 'pick' and mentor Aboriginal people into jobs have implications for the rules that governments apply to job seekers and to selection for publicly funded jobs. As Cape York leader Richard Ah Mat (2003) points out, family and kinship networks are the primary unit for responsibility, initiative, self help and social recovery in Aboriginal societies. However, this key role of family and kinship networks has been devalued by the emphasis in government policy for the past three decades on the primary unit being 'community', invariably meaning all the Aboriginal residents of a settlement. Accusations of nepotism commonly result when Aboriginal people allocate 'community resources' through family and kinship networks. These accusations stem from a pervasive incompatibility between state and Aboriginal cultural institutions that presents moral dilemmas for both Aboriginal people and the state (Peterson 2005). Ah Mat (2003) argues that the situation is the source of considerable dispute between families in relation to 'community' decision making. He also argues that it has generated significant psychological and cultural barriers to entrepreneurial activity by Aboriginal individuals and families. Such barriers are indicated in the bush foods case study in the lack of support that Aboriginal bush food industry participants report from among other Aboriginal people.

Our experience from the Anmatjere case study suggests an opportunity for governments and other service delivery organisations to introduce policies and incentives that better support family and kinship and other established social networks to pick and mentor people into jobs and other roles of responsibility. The aim, in terms of a sustainable livelihood approach, would be to reform institutions so that they engage social capital more effectively into livelihood strategies. An important starting point is for agencies to work with Aboriginal people to identify the small scale intra-community 'trust networks' (Gerritsen and Straton 2006) that are most important for employment and entrepreneurial behaviour and to understand the aspirations of the people in these networks. These trust networks are likely to be strongest within families and customary kinship groups. Action research approaches that use the sustainable livelihoods approach with these groups and that carry the political will to resolve institutional conflicts are likely to return strongest outcomes.

Conclusion

International experience has pointed to the value of the sustainable livelihood approach as a way of thinking about and analysing livelihood systems and identifying actions that will reduce vulnerability of poor and disadvantaged people. Our early experience in applying the approach in desert Australia supports this conclusion. We have found, to date, that the sustainable livelihoods diagrammatic framework has value as a conceptual model and that the sustainable livelihoods approach needs to be applied flexibly, rather than as a blueprint. When used collaboratively in participatory processes, the approach is proving effective at developing a shared understanding between researchers and desert Aboriginal people about vulnerabilities, assets and strategies that impact on livelihood outcomes. Its use in conjunction with other tools from institutional analysis and socio-ecological systems modelling has promise for supporting improved understanding of regional systems dynamics and directions for institutional change that will generate more sustainable livelihoods for Aboriginal people in remote desert regions.

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