SUSTAINABLE LIVELIHOODS APPROACH AND COMMUNITY DEVELOPMENT IN PRACTICE IN ENGINEERING ORGANISATIONS

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CERTIFICATE OF AUTHORSHIP/ORIGINALITY

I certify that the work in this thesis has not previously been submitted for a degree, nor has it been submitted as part of the requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Helen Salvestrin

July 2006

ABSTRACT

This thesis explored the limitations and challenges to a grassroots engineering non-government organisation for the use of the sustainable livelihoods approach in a community development scenario. The sustainable livelihoods approach is a relatively new approach developed to address the failure of previous approaches to community development. Its key focuses are holistic, people-centred, dynamic and sustainable development, working with people's strengths and establishing macro-micro links.

The role of engineering activities in community development is vital in the provision of technology and is visible across water, sanitation, energy, transport and telecommunications sectors. Again, however, community development activities in technology have not proven successful, thus the move towards the increasingly promoted approach of sustainable livelihoods.

The major proponents of the sustainable livelihoods approach have developed many case studies and guidelines to address the contrasts in practice between sustainable livelihoods and current practice, common across many sectors including health, education and agriculture, to name a few. Such research into the contrasts and likeness of engineering practice in particular in community development through the sustainable livelihoods approach has not been explored. This research aims to address this gap.

A case study of a Nepali engineering non-government organisation was used to explore these limitations and challenges to practice. Participatory methodologies were used to ensure that results and opportunities were identified from within the organisation itself. Data was collected through workshops, focus groups, interviews, surveys and overt observation. Cycles of systemic analyses were used to explore the problem situations for sustainable livelihoods practice as identified by the case study, and to develop systemically feasible and culturally desirable changes. Two approaches to these analyses, one based on logic, and the other based on culture, addressed the complexities characteristic of the community development and engineering sectors. Data was also collected from external stakeholders directly associated with the engineering activities of the case-study organisation to define the context for the research and verify that collected from the primary case-study organisation.

The key findings of the data collection phase were seven problem areas for the organisation in the case study: providing community infrastructure and improving

livelihoods; adopting a sustainable livelihoods approach; meeting the need for community participation; monitoring and evaluation; developing partnerships; learning about sustainable livelihoods; and addressing the role of community technology.

Conceptual models were developed for analysis of the key problem situations. Systemic analyses of the key stakeholders, limitations, and the political and social contexts and the conceptual models identified the disparities between the ideal practice and the reality of practice for each problem situation. Whilst the research aimed to explore practice specifically for engineering, the majority of the results from the case study focused on changes for the early establishment of an organisation in the field of sustainable livelihoods. Key challenges for the grassroots organisation in the case study included limitations to the learning capacity of the organisation, imbalances of power with higher level partners, and, importantly, issues of risk and survival. Real and practical changes to the practice of community development organisations based on the case study included using more participatory methodologies, addressing scheduling issues, developing bottom-up activities and more effective partnerships with donors. These were limitations general to non-sector-specific organisations.

The research subsequently explored the challenges specific to *engineering* organisations in adopting the sustainable livelihoods approach. These focused on ensuring that engineering in community development incorporates not only the natural and non-natural elements of intended community users but also the human elements. Five areas of practice were identified as being affected by the sustainable livelihoods approach, including the nature of technology, the processes for its development, the supporting role of national and international policies and standards, and the culture of engineering, specifically the role of engineering expertise and education. The opportunities in these areas of practice for sustainable livelihoods focused on ensuring a people-centred approach to engineering for community development.

The research had implications for the practices of a variety of engineering organisations in the community development sector, including NGOs, standards organisations, legislative and regulatory bodies and educators. Again, these implications focused on ensuring that engineering in community development directly reflected the priorities, skills and dynamics of the intended community users.

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ABBREVIATIONS

AYAD	Australian Youth Ambassadors for Development
CBO	Community-based Organisation
DDC	District Development Committee
DFID	Department for International Development
FAO	Food and Agriculture Organization
M&E	monitoring and evaluation
ENGO	engineering non-government organisation
GNP	Gross National Product
GO	Government organisation
HDI	Human Development Index
HMGN	His Majesty's Government of Nepal
IDS	Institute of Development Studies
IDS-Nepal	Integrated Development Society-Nepal
INGO	international non-government organisation
I/NGO	international and national non-government organisation
ISO	International Organisation for Standardization
ITDG	Intermediate Technology Development Group
LDC	least developed countries
LFP	Livelihoods and Forestry Programme
MDG	Millennium Development Goals
MoU	Memorandum of Understanding
MPPW	Ministry of Planning and Physical Works
NGO	non-government organisation
NR(s)	Nepali rupee(s)
ODI	Overseas Development Institute

O&M	operation and maintenance
PIP	policies, institutions and processes
PRSP	Poverty Reduction Strategy Paper
RBA	rights-based approaches
RWSSFDB	Rural Water Supply and Sanitation Fund Development Board
SL	sustainable livelihoods
SSM	soft systems methodology
SWAp	Sector-wide approach
UNDP	United Nations Development Programme
UTS	University of Technology, Sydney
VDC	Village Development Committee
WSS	water supply and sanitation

CHAPTER 1. INTRODUCTION

There is agreement between many authors and major international development agencies that past and present approaches to community development have not had the success necessary to alleviate poverty and that a change in approach is necessary (World Bank, 1998; Organisation for Economic Co-operation and Development, 1999; ORE, 2002; Thomas, 2002; Kumar, 2003). Various alternatives have been suggested, one of which is the sustainable livelihoods (SL) approach. The value added to poverty reduction programmes through the implementation of the SL approach has already been noted by several of the larger development agencies (Ashley and Carney, 1999; DFID and FAO, 2000; Carney, 2002). The major proponents for this holistic, cross-sectoral approach include the Department for International Development (DFID), the United Nations Development Programme (UNDP), the Institute of Development Studies (IDS), the Food and Agriculture Organization of the United Nations (FAO) and the Overseas Development Institute (ODI).

The cross-sectoral SL approach challenges the practice of community development organisations. Extensive literature, developed by the above major proponents, can be found regarding the processes and challenges of SL and case studies. The majority of these case studies involve resource management (Slater and Twyman, 2003; Allison et al., 2004), health (Integrated Support to Sustainable Development and Food Security Programme, 2003; Bishop-Sambrook and Tanzarn, 2004), migration (Deshingkar and Start, 2003) and agriculture (Orr, 2001; Hussein and Montagu, 2000), whilst few explore the practice of SL in engineering community development organisations and activities.

Amongst these case studies for engineering, largely in activities such as water and sanitation, changes to practice to enhance SL approaches that have been identified are long-term, big budget, low-risk framework changes implemented largely by international non-government organisations and are appropriate to non-sector-specific organisations (Hyden, 1998; Harpman and Anelay, 1999; Ashley and Carney, 1999; Sustainable Livelihoods Unit, 1999; Nicol, 2000; Organisation for Economic Co-operation and Development, 2001; Beckwith et al., 2002; Satterthwaite, 2002).

This research uses a case study of a grassroots Nepali organisation to explore practice for SL specific to engineering organisations.

1.1.Hypothesis

The adoption of the sustainable livelihoods approach will affect the practice of engineering in community development organisations.

1.2.Objectives

In an attempt to improve the practice of SL by traditional engineering non-government organisations, the objectives, through action research, are to:

(i) develop SL capacity in a grassroots engineering non-government organisation (NGO);

(ii) detail the impacts and challenges of the transition from current community development approaches to the SL approach on engineering practice in the NGO; and

(iii) identify best practice for engineering non-government organisations and related agencies to implement activities through the SL approach.

Whilst the research will explore opportunities and limitations afforded by organisations external to the NGO, they are not participants in the reflective action phase of analysis and it is not an objective of the research to affect change in these organisations.

1.3.Justification of research

The case study in the research explores practice for the sustainable livelihoods approach defined by four variables:

(i) sector;

(ii) community development agency;

(iii) organisation;

(iv) country;

The function of technology in community development is uncontested, with roles in facilitating trade, social protection, access to services, improving mobility, lowering inputs costs and improving security (DFID, 2002a). However, the success of technological interventions for community development has typically been low. The development of the sustainable livelihoods approach was a reaction to this failure and the failure of community development programmes in general. The increasing

prominence of SL in the agendas of major international community development agencies prioritises the need to improve practice. The challenges to practice through sustainable livelihoods for engineering in particular has been poorly documented to date.

The research focuses specifically on NGOs as these organisations have less defined structures and processes than the private sector and operate outside the more rigid frameworks of government organisations, allowing more opportunities for change in practice. Additionally, the absence of the profit imperative of the private sector allows NGOs to work more closely with poor communities, a working modality and flexibility increasingly desired by donors. Improving practice in NGOs is therefore increasingly important as they are gaining favour in the community development sector. Further, the existence of more than 16,000 NGOs in Nepal alone heightens the need for effective practice (NGO Forum for Urban Water and Sanitation, 2004).

The organisation in the case study (Integrated Development Society (IDS)-Nepal) is a relatively new grassroots NGO developing best practices based on the sustainable livelihoods approach. The case study will provide an example for reducing the challenges and impacts of the transition to engineering practice based on the SL approach for such smaller organisations. This process will be reflected in many grassroots organisations internationally. Additionally, previous research links have been established with the case study organisation, allowing more effective facilitation of the research. Finally, the NGO has itself requested assistance with the adoption of the SL approach.

Nepal serves as an effective example of well-established practices for community development. The broad national structures and institutions for the provision of community development services have existed since the 1950s. These provide an existing support network for the transition in practice for the organisation, reducing the external variables for the transition from traditional community development practice to that for SL.

Additionally, Nepal, with political unrest, social divisions and geographical instability, is subject to many of the causes of poverty. Thus, the context is applicable to many of the countries throughout the world that are stricken with poverty.

Further, with high foreign investments and inadequate progress towards the internationally agreed-upon Millennium Development Goals, Nepal is in need of greater community development effectiveness.

1.4.Background to the research

The researcher was placed as a Project Engineer with IDS-Nepal, a Nepali NGO, from October 2003 to October 2004 under AusAID's Australian Youth Ambassadors for Development (AYAD) program. This research placement was developed through previous research links with IDS-Nepal and the University of Technology, Sydney (UTS).

During the data collection phase in Nepal the existing political and social unrest escalated in size and extent. This affected not only the researcher's role, but also the role of IDS-Nepal and community development agencies in the country.

1.5.Thesis Outline

Chapter 2 Literature Review provides a background to the current literature on the need for community development, current approaches and the move towards the SL approach. It discusses current engineering community development organisations and their practice. The need for change from the current engineering approach is examined. It then explores the theoretical best practice for community development and engineering through SL. It also explores the background to the methodology used to guide the research in the complex, ill-defined problems characteristic of community development and engineering, and its role in participatory learning in organisations.

Chapter 3 Research Context provides a background to the geographical, social, political and economic environments of Nepal. It briefly explores the extent of poverty and the role of existing community development in Nepal. The role of infrastructure and technology in community development in Nepal and targets in this sector are defined. A brief introduction to SL in Nepal is also provided.

Chapter 4 Methodology outlines the methodology used in the research. Soft systems methodology, as detailed by Checkland and Scholes (1999), provided a guideline to the participatory approach of the research to ensure that change is identified and implemented from within the organisation to enhance the long-term sustainability of the

change. The chapter also details the data collection from, and the roles of the external stakeholders used in the research.

Chapter 5 Results and Analysis presents the results from the workshops and data-collection phases with IDS-Nepal. Seven systems and the corresponding conceptual models for the problem situations identified by IDS-Nepal are developed and analysed. Two examples of IDS-Nepal's projects illustrate the challenges for engineering in SL. Secondary data from external stakeholders collected in order to build a complete picture of the challenges to engineering practice in community development in Nepal is summarised.

Chapter 6 Discussion explores the challenges drawn from the seven models of the case study of IDS-Nepal. Implications for the NGO of the case study are explored, as is practice for the wider collaborative community in the community development sector, including educators, legislative and regulatory bodies and policy-makers. The chapter summarises the inadequacies of the widely promoted appropriate technology philosophy and a definition of the role of sustainable livelihoods as a unifying factor for technology and people in community development. It concludes with a brief discussion on the results of the monitoring and evaluation of the research and a subsequent discussion on the relevance of the methodology.

Chapter 7 Conclusion reviews the results of the research and summarises the implications for practice of engineering non-government organisations and collaborative bodies.

Chapter 8 Recommendations explores the possibilities for further extending this body of research, focusing more specifically on technology in engineering and the capacity of a variety of engineering roles to adopt the SL approach.

CHAPTER 2. LITERATURE REVIEW

2.1.The state of poverty worldwide

Poverty is largely defined in terms of income (International Fund for Agricultural Development, 2002b; World Bank and Oxford University Press, 2003), whereby extreme poverty is defined as existing for those people whose income and equivalent is less than US$1 a day (United Nations, 2000). This definition of 'dollar poverty' is commonly used for ease of comparison between communities, times and places. However, the multidimensionality of poverty is readily acknowledged in the deprivation of food security, health, rights, education, decent work, market access, personal security and land ownership (Organisation for Economic Co-operation and Development, 2001; International Fund for Agricultural Development, 2002a). These dimensions lead to other definitions of poverty, including those based on literacy, access to services or child mortality.

Current estimates are that 23% of the population worldwide is earning less than US$1 per day (Secretary General, 2002). An important dimension to this figure is its change with time. In 1990, 29% of people worldwide were living in extreme poverty. Together, these two figures show that poverty is being reduced, however, the variations between regions are vast.

A second, more complex set of measures of poverty is based on the United Nation's Millennium Development Goals (MDG). These goals are measurable targets summarising the community development agenda compiled by major agencies throughout the 1990s and agreed upon by 189 countries (UNDP, 2004). Again, these goals and their associated targets and indicators represent a relative change in the extent of poverty between 1990 and 2015. The Millennium Development Goals are (UNDP, 2003):

- halving extreme poverty and hunger;
- achieving universal primary education;
- promoting gender equality;
- reducing under-five mortality by two-thirds;
- reducing maternal mortality by three-quarters;
- reversing the spread of HIV/AIDS, malaria and tuberculosis;

- ensuring environmental sustainability; and
- developing a global partnership for development, with targets for aid, trade and debt relief.

Table 1 summarises these indicators for global regions. This data, when compared to that for the early 1990s, again shows regional variations. In particular, East Asia and the Pacific are on track to meet all the goals. Globally, however, only two of these goals, halving income poverty and access to safe water will be met worldwide based on this progress (UNDP, 2004).

A third measure of poverty, again multidimensional in nature, the Human Development Index (HDI), based on living a long and healthy life, education, and standard of living, shows an increase in poverty in 46 countries in 2000 when compared to 1990 (UNDP, 2004).

Cautiously based on these measures of poverty[1], countries are prioritised for community development programmes. Sub-Saharan Africa has the widest need, with 27 countries rated as top priority. Three countries in the Arab States and one each in East Asia and Pacific, South Asia and Latin America and the Caribbean are also rated as top priority (UNDP, 2004).

As a group, these countries with high incidences of poverty are termed 'least developed countries' (LDCs).

[1] Internal regional variations and imprecise measurements can lead to inaccurate characterisations.

Table 1: Worldwide human development indicators (millions of people)

Region	Living on less than US$1 per day	Total population undernourished	Primary-age children not at school	Primary-age girls not in school	Children under age 5 dying each year	People without access to improved water sources	People without access to adequate sanitation
Sub-Saharan Africa	323	185	44	23	5	273	299
Arab States	8	34	7	4	1	42	51
East Asia and the Pacific	261	212	14	7	1	453	1,004
South Asia	432	312	32	21	4	225	944
Latin America and the Caribbean	56	53	2	1	0	72	121
Central & Eastern Europe and CIS	21	33	3	1	0	29	-
World	1,100	831	104	59	11	1,197	2,742

(adapted from UNDP, 2004)

2.2.A brief overview of community development approaches

The provision of assistance by developed countries to LDCs has been a task of many local, national and international organisations for many decades since the rebuilding of Europe post-World War 2, in the late 1940s and early 1950s (World Bank, 1998).

Assistance to LDCs consists of three key activities: disaster relief, foreign aid and foreign development. Short-term humanitarian relief focuses on immediate assistance to countries in an emergency situation after a natural or political disaster. These programmes provide financial, emotional and material assistance to communities displaced from their own infrastructure (whether it be social, financial or physical infrastructure), or those whose existing infrastructure has been destroyed (Caritas Australia, year unknown).

Foreign aid and foreign development in contrast to disaster relief are activities conducted over longer timescales. The difference between these two activities is often misunderstood. Officially, aid is:

> *grants or loans to countries or territories which are: (a) undertaken by the official sector; (b) with promotion of economic development and welfare as the main objective; (c) at concessional financial terms* (DAC, 2005).

Where aid is the supply financial or material capital, development, on the other hand, is a process. It is:

> *a comprehensive economic, social, cultural and political process, which aims at the constant improvement of the well-being of the entire population and of all individuals on the basis of their active, free and meaningful participation in development and in the fair distribution of benefits resulting therefrom* (Office of the High Commissioner for Human Rights, 2002).

Foreign development is the focus of this research. To distinguish foreign development activities in LDCs from commercial development in the industrialised world, the term ‘community development’ will henceforth be used. The community is the beneficiary of these activities.

The approaches used to identify those communities most in need of community development and how best to deliver assistance have changed with time. The overarching aim, however, is to reduce the number of poor people.

Traditional approaches to community development have focused on the provision of technical solutions, the trickle-down theory or policy change (Harpman and Anelay, 1999). Other approaches have been to enhance production such as the High Yielding Programme in India, raise employment opportunities in programmes such as Rural Manpower in India (James and Robinson, 2001), or increase income (Chambers and Conway, 1992). These, however, have proved resistant to the normal processes of change in society such as population growth, development of technology, disease or inflation and have therefore had low rates of success. Ellis and Biggs (2001) note the transition in community development approaches since their early implementation in the 1950s in Figure 1.

In contrast to these technical approaches, more recent community development approaches have focused on social or political frameworks, safety network approaches or financial assistance to directly reduce or eradicate poverty (Ellis and Biggs, 2001). As a set of internationally agreed upon targets for these poverty reduction or eradication approaches the UN's Millennium Declaration for example, proposes to halve, by the year 2015, the proportion of the world's people living in extreme poverty (United Nations, 2000).

Figure 1: Transition in community development approaches

(adapted from Ellis and Biggs, 2001)

2.3.Community development

2.3.1. Engineering practice in community development

Typical engineering in community development includes the following type of projects, focusing on technology and infrastructure:

- supply and installation of pit latrines and tubewells;
- provision of de-centralised energy supplies such as solar photovoltaic cells, micro-hydro and wind schemes;
- provision of facilities for basic education and health;
- provision of transport and processing facilities;
- development of bridge construction standards; and
- development of water quality policy.

The benefits of infrastructure and technology in reducing poverty are widely acknowledged: directly through lowering input costs, facilitating trade, creating employment, opening up opportunities for entrepreneurs, social protection and improved access to services; and indirectly through improved security, better health and improved mobility and access (DFID, 2000b).

2.3.2. Engineering practitioners in community development

Engineering practitioners in community development range from government organisations and non-government organisations to for-profit or private organisations. Each of these operates for a variety of purposes, in a variety of contexts and with a variety of resources. These will be characterised in the following sections, which are summarised in Table 2.

2.3.2.1.Government organisations

Government organisations (GOs), at national, district and local levels, operate on a financial basis not driven by profit. Legislation is created at the government level and is therefore likely to be reflective of the goals of individual ministries (DFID, 2002a). Structured codes of practice dictate numerous aspects of practice, from employee conditions to the quality of outputs. Resources, from financial to human resources are more freely available than for other engineering practitioners. Government practitioners

have little accountability or responsibility for adherence to contract details. The organisation of GOs tends toward vertical hierarchies (Atack, 1999). Such organisation results in the success of its activities resting on its ability to coerce participants or partners. The target group of government activities is both spatially and socially widespread and therefore presumed homogenous (Meyer, 1992).

Policies, regulations and targets are set centrally, representing homogenised environments, contextual situations and community needs (Chambers, 1993).

Increasingly, GOs are depending on the private sector and NGOs to deliver government-defined services and, increasingly, correspondingly the roles of GOs are in policy-making at the macro-level (Atack, 1999).

2.3.2.2.Private sector

Financial gain is the sole purpose of the private sector. This primary goal dictates many aspects of the organisation, down to the very nature of infrastructure involvement for the private sector. For example, energy and telecommunications services at the national level are more likely to return greater profits with greater ease than local water and transport infrastructure projects (DFID, 2002a). The private sector bids in a competitive market for its share of the community development markets. Its greatest goal is to meet consumer demand at the smallest possible price, which highlights the need for efficiency in its activities (Meyer, 1992). Against this however, is its need to make a profit for its shareholders (Carter and Danert, 2003). Adherence to contracts or Terms of References introduces an aspect of accountability and transparency to private practice. Legal, financial and commercial legislation dictates other aspects of practice. Dependence on the custom of beneficiaries results in accountability downwards of the private sector (Smout, 1996). As for NGOs, as discussed in section 2.3.2.3, the private sector operates outside the political environment of government bodies. In contrast to government organisations, the private sector implements discrete projects.

2.3.2.3.Non-government organisations

Non-government organisations typically operate outside government frameworks on projects that are either not provided or provided to a poor standard by the government (Franceys and Weitz, 2003; Helmig et al., 2004). This allows NGOs a flexibility and autonomy not possible from within government structures They are typically value-driven (Chambers, 1993). Budgets are often tight and fixed for NGOs, and overhead

administration costs are difficult to cover in project budgets. Capital or resources, such as laboratories, libraries or sample technologies are often lacking to NGOs (Kaimowitz, 1993). However, NGOs are increasingly trying to affect government policy based on field experience (Edwards and Hulme, 1996; Atack, 1999). Financially, NGOs are reliant on funding from donors and government, which is often short-term in nature, reflecting short-term project approaches (Bebbington, 1997; Lister, 2000). Due to this financial dependence NGOs are accountable to both organisations. With their not-for-profit outlook, however, and their financial independence from beneficiaries, staff and partners, NGOs have an absence of accountability downwards (Smout, 1996). Atack (1992) notes, however, that this not-for-profit value means that the success of the activities of NGOs rests on the cooperation and participation of beneficiaries and partners. Networks and horizontal organisational structures are distinctive in NGOs. The scope of NGOs tends to focus on discrete communities, with specific and often heterogenous needs (Meyer, 1992).

Table 2: Characterising engineering community development practitioners

	Non government organisations	**Private sector**	**Government organisations**
For-profit mandate	No	Yes	No
Upward accountability	Yes	Yes	No
Downward accountability	No	Yes	No
Competitive	Yes	Yes	No
Project implementers	Yes	Yes	No
Political influence	Low	Low	High
Financial independence	Low	Medium	High
Availability of resources	Low	Medium	High
Flexibility	High	Medium	Low
Spatial impact	Discrete	Discrete	Wide

2.3.3. Characterising practice in community development

This section serves to broadly characterise current community development practice as a basis for subsequent contrast with that for more recent SL practice. Where possible, practice specific to engineering is characterised.

2.3.3.1.Management

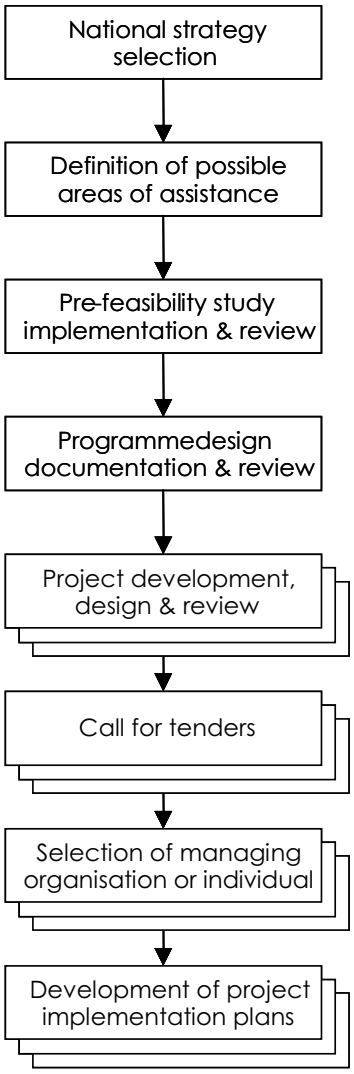
Current management focuses on individual, short-term, large and complex projects, with quantifiable outputs, such as the number of latrines built, the number of people in training, or the length of road constructed (Thomas, 2002). These projects are implemented in a step-by-step fashion according to a defined timeline, which generally runs through problem identification, project planning or design, implementation or construction and operation and maintenance phases (Narayan, 1995). Longer-term programmes can combine a number of smaller projects of varying natures to achieve an overall programme goal. Both projects and programmes are time-bound to meeting specific goals (Franks et al., 2004). The typical planning and design process of development activities is illustrated in Figure 2. Thomas (2002) notes that this process is similar for programmes led by donors or the government.

Jobs are identified on a supply basis, often in an ad-hoc manner with little strategic planning. For the private sector and NGOs jobs are highly dependent on funding opportunities and market openings identified by the donor (Aminuzzaman, 2000). Donor-recipient roles strongly influence the direction and size of projects. Economic and political risks are assessed to determine the likelihood of success of the project (Sustainable Livelihoods Unit, 1999).

The timing of projects strongly reflects the project-specific management approach. Projects are short-term, planned according to defined project schedules with little consideration for uncertainties such as weather, physical access, political stability, community acceptance or availability of the workforce. The short timeframe of projects is generally insufficient to realise substantial development outcomes (Power et al., 2002).

Ongoing monitoring and evaluation (M&E) and operation and maintenance (O&M) resources, financial or scheduling requirements are not included in the project planning (DFID, 1998).

Figure 2: Typical programme/project planning and design process



(adapted from Thomas, 2002)

This project-specific management approach is reflected in project costs, which tend to be attributed to the project for the short-term duration of the project implementation only, with little attention given to costs for ongoing M&E or O&M costs. The large costs of infrastructure are often subsidised in an attempt to make it affordable for the poor (DFID, 1998; Clarke and Wallsten, 2002). These costs are being borne more and more by a partnership of private and public funds (World Bank, 2003a).

Management of projects is in a top-down, hierarchical manner. Decisions are made at upper management level and lower levels implement the decisions (Harpman and Anelay, 1999). Accountability and transparency are from the bottom upwards (Power et

al., 2002). This results in little accountability of service providers and government bodies towards the people whom they serve (Das Gupta et al., 2000).

Engineering projects are considered complete at the end of construction. The details, such as frequency, workforce and cost of O&M or M&E after the completion of construction are given little consideration (Harpman and Anelay, 1999).

Local contractors are a small, if any, part of the workforce in engineering community development activities, supplying labour only. This workforce is largely informal and temporary. National labour standards, where they exist, are often unmonitored and not enforced (Ladbury et al., 2003).

2.3.3.2.Skills

Engineering in current community development is implemented largely in individual sectors, thus defining the skills of staff required. Examples are seen in large development agencies from both Australian and international organisations. Whilst AusAID's guiding themes (AusAID, 2002) of good governance, globalisation, strengthening human capital, increasing security and promoting sustainable resource management are multilateral development approaches, the delivery of these themes in engineering disciplines is through either infrastructure or rural development programmes.

The sector approach is particularly vivid in engineering community development, as illustrated in two of Australia's key international assistance programmes. Programmes range from Civil/Construction/Building, Roads and Bridges, Mechanical Engineering and Radio Telecommunications to Environmental Management and Water Sources with Registered Engineers for Disaster Relief (RedR) (Registered Engineers for Disaster Relief, 2003) and a variety of engineers are called upon including civil, mechanical, electrical and agricultural, by Australian Volunteers International (AVI) (Australian Volunteers International, 2003).

The skill base of engineers is required only to reflect their particular sector.

2.3.3.3.Design and technology

The technology in engineering development projects ranges from larger infrastructure and technology transfer projects such as for bridge construction or village sanitation to the more recent smaller-scale low-cost technologies of the appropriate technology

movement. The model for technology development typical to both of these approaches optimises the technology first, then consults with the user and finally explores any regulations or standards affecting its use (Wakeford, 2004).

(i) Large infrastructure design and technology transfer

Chambers (1993) defines the typical core technology of engineering for infrastructure projects as large-scale, capital intensive, inorganic, market-linked, mechanical, developed in core and high technology.

The planning and design process is typically a linear, rational, goal-driven process (Thomas, 2002). Planning and design is dependent on the validity and sufficiency of input data, appropriate objectives, the reliability of existing infrastructure for the timely provision of dependable construction materials and the continual availability of a labour workforce.

Thomas (2002) notes that design and its appraisal is commonly superficial or conducted by staff uninformed of site-specific issues such as the social, political, natural and cultural environment of the target community. The isolation of the design process can lead to a lack of relevance and sustainability of the project. Often, imported, high-cost materials or project-specific materials, made to specifications are required. Where community participation has been incorporated into these projects, the community has been used to inform the early process of the local situation, and engineering experts have controlled the analysis and design phases (Sustainable Livelihoods Unit, 1999).

(ii) Appropriate technology

Appropriate technology is found at what tends to be the smaller end of the infrastructure scale.[2] It is:

> *any technology that makes the most economical use of a country's natural resources and its relative proportions of capital, labour and skills, and that furthers national and social goals* (Harrison, 1983)

[2] This philosophy of appropriate technology was initiated in India by Mahatma Gandhi and then developed by Ernst Schumacher in the middle of the last century.

Whilst being suitable for the individual country and its context, appropriate technology can be broadly characterised as:

- labour-intensive, to create as many jobs as possible;
- reflecting scales of local economies;
- improving income;
- using scarce capital wisely;
- simple to run and repair;
- using locally produced materials and equipment;
- meeting the needs of both men and women; and
- hygienic, non-polluting and using renewable sources of energy (ITDG, 2005a).

Examples of appropriate technology include solar fruit dryers in Nepal to provide fruit for the dry months to improve nutrition, biogas and liquid biofuels to reduce the time spent on collecting fuelwood in countries that are increasingly barren, or rainwater harvesting jars in drought-stricken Kenya to improve agricultural productivity (Barton, 2001b).

The somewhat limited success of appropriate technology is attributed to its focus on micro-level technology. This focus has avoided institutional macro-level development and globalisation issues. Where appropriate technology aims to enhance indigenous technologies for improved resource utilisation, it falls short of assisting the integration into global economies and macro-economic growth (ITDG, 2001).

Critics of appropriate technology also suggest that technology needs to be appropriate only for the geo-climatic context of a country for it to succeed (Emmanuel, 1982). The need for technology to also reflect the socio-cultural and institutional contexts of a country as promoted by its advocates serves only to develop poor technology for poor people, which, as Emmanuel (1982) suggests, serves to perpetuate this poverty. Leapfrog technology answers this shortcoming by accelerating the development of existing LDC technology through the development trajectory of developed countries to use technologies that offer new solutions and access to the global economy (Tikly et al.,

2003; Cascio, 2004). Leapfrog technology[3] similarly aims to avoid replicating the environmental mistakes of the technology of developed countries.

(iii) Technology standards and policies

Engineering standards dictate much of the design, construction and implementation processes of infrastructure projects and may be dictated by international or regional bodies. DFID, for example, identifies design standards for technical design, use of materials and construction practice in its water and sanitation activities (DFID, 1998). Additional frameworks include standards for minimum quantity or quality, access and availability. Regulations for contractor management, the tender process, stakeholder liaison and budgeting further define engineering practice for community development (Bos, 2001).[4] Globally, the International Organization for Standardization (ISO) develops voluntary standards largely focused on technical detail, however, also defining services, management practices and conformity assessment (ISO, 2004a). The aims of these standards are to improve development, manufacturing and supply of goods and services, improve international trade, provide a base for health and safety, assist in technology and process transfer and safeguard consumers. Thus, the ISO considers standardisation as having an increasing impact on social and economic environments.

For LDCs, ISO also values the role of standards highly. Standardised codes for practice assist LDCs through:

- greater competitiveness, growing market share and higher price of exports;
- increased benefit from the transfer of technology from communities to domestic markets and from LDCs to international markets;
- improved resistance to undesirable low-quality imports, competing with more locally appropriate and relevant technologies;

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[3] Examples of leapfrog technology include mobile phones promoting access in Ghana (Zuckerman, 2005), solar panels in Pakistan (Cascio, 2003) or the all-digital hospital in Thailand (Faludi, 2004).

[4] Further examples are provided by the Sphere Project, which has developed its own set of standards for engineering in rapid-response community engineering (The Sphere Project, 2004).

- increased competitiveness for attracting investment or procurement and stimulating economic activity; and
- facilitated development and effectiveness of infrastructure, networks and investment (ISO, 2004a).

It is acknowledged, however, that in LDCs commitment to such standards often requires large initial inputs with new infrastructure, tools, skills and organisations. In acknowledging this, ISO has committed to assisting the development of these processes and structures through a dedicated action plan, policy committee (DEVCO), and Chair's Advisory Group (DEVCO CAG) to coordinate between the technical bodies of ISO, international community development agencies and members of LDCs and developed countries (ISO, 2004b). The objectives of DEVCO are:

- *To identify the needs and requirements of developing countries in the fields of standardization and related activities (i.e. conformity assessment including accreditation, quality and metrology) and to assist the developing countries, as necessary, in defining these needs and requirements.*
- *Having established these needs and requirements, to recommend actions to assist the developing countries in meeting them.*
- *To monitor the implementation of the ISO Action Plan for developing countries.*
- *To provide a forum for the discussion of all aspects of standardization and related activities, and for the exchange of experience among developed and developing countries.*

National laws and regulations often dictate the range of infrastructure, including telecommunications, water, sanitation and electricity, required in communities (Clarke and Wallsten, 2002).

2.3.3.4.Monitoring and evaluation

Current monitoring and evaluation is based on quantitative measures of achievement; the number of items built; the reduction in pollution; the increase in quality (DFID, 1998; Thomas, 2002). Monitoring and evaluation typically is carried out as an 'add-on' only, to meet the demands of the macro-level implementers or the donor (World Bank

and Oxford University Press, 2003; Franks et al., 2004). It is often carried out by the implementing partner or the government (Thomas, 2002).

2.4.The need for change

Over the preceding fifty years of community development, both the World Bank and OECD have invested considerable time in assessing the success of community development projects across a range of agencies and approaches (World Bank, 1998; Organisation for Economic Co-operation and Development, 1999). There is agreement between these major international community development agencies that past and present approaches have not had the success necessary to alleviate poverty on a large scale. The World Bank effectiveness study (1998) notes some of the conditions that were common amongst those programmes that did not achieve their goals include:

- the provision of large amounts of money;
- lending on the condition of reform; or
- focusing on individual projects.

These shortcomings are reinforced by a study of 32 World Bank projects (Kumar, 2003). In these projects, the limited effectiveness has been attributed to their project approach (versus longer-term programmes approach), insufficient acknowledgement of the sociological context and their insufficient awareness and support of the poorest communities.

An AusAID report (ORE, 2002) identified inadequacies in the relationships with partner organisations and counterparts in foreign assistance activities. Poor ownership of projects/programmes was attributed to a failure to work in the local language, poor trainer development activities, a lack of local staff or a lack of a shared vision with local counterparts. Further, a lack of sustainability of funds was identified as a key to the failure of projects.

In design projects most problems arise from a lack of communication and development with in-country partners, ignoring the needs of the communities, and the cultural, political, social and institutional settings in the design (Thomas, 2002).

The preceding discussion identifies a shortcoming in the success of current community development projects. As identified in section 2.1, the incidence of poverty is increasing; a change in approach to community development is thus required.

For engineering activities in community development, current (pre-SL approach) practice is riddled by just as many inadequacies.

Poorly suited financing schemes have often led to the provision of infrastructure that is financially inaccessible to those for whom it was intended (Clarke and Wallsten, 2002; DFID, 2004b). Cross-subsidies for telecommunications, sanitation, potable water and electricity have failed to target low-income households, or poor households were paying higher average prices than wealthier households. This can come from the programme level or from national policies and regulations that are unable to coordinate across multiple sectors or that are unable to represent the variety of needs across a diversity of cultures (Bos, 2001) .

Inappropriate identification of the very poor for infrastructure design has resulted in infrastructure that is again physically as well as financially inaccessible to the community (Smout, 1996; Bos, 2001). An example that can be considered is the lack of power supply to people who were relocated for the construction of a hydroelectric dam in India. Additionally, the needs of women are largely ignored, of particular importance in communities where women are the household managers.

Inadequate environmental assessments for infrastructure projects have resulted in damage to the very environment upon which the poor are dependent for their survival (DFID, 2002a). The introduction of subsidies for groundwater pumping for irrigation, another example, can reduce access and viability of this source for the poorest of the community.

A lack of attention, funds, resources, skills or continuity in management for operation and maintenance (O&M) results in infrastructure that fails, over its lifespan, to meet its purpose (DFID, 1998; DFID, 2002a; Singleton, 2003). This may be attributed to a community less than willing to pay for services or technology provided; due to alternative, cheaper options; the realisation of a need not met by the intervention; or the lack of a sense of ownership for the project (Sohail et al., 2001; Harris et al., 2003).

Corruption and a lack of transparency and accountability have been identified throughout the literature as key elements in the failure of top-down infrastructure activities, preventing appropriate design of technology, target group identification or adequate financing schemes (Smout, 1996; DFID, 2002a; Harris et al., 2003). Sometimes big-budget technology such as a bridge is chosen over smaller and cheaper

access options for the opportunities it can bring for siphoning off funds by the program manager.

2.5.Review of community development approaches

Section 2.4 outlines a need for change in the approach for community development, and more specifically, for engineering in community development. The SL approach is one in a field of many and diverse conceptual and operational frameworks. Many of these frameworks share common goals, tools and sometimes methodologies. A brief introduction to two of these approaches with some methodologies common to the SL approach, the sector-wide approach (SWAp) and the rights-based approach (RBA), is provided to introduce the field of community development and establish a basis for SL.

2.5.1. Sector-wide approach

A sector-wide approach is a top-down approach to development, coordinated jointly by governments and donors in sectors and/or countries highly dependent on funds from foreign countries. Governments have the greater share of ownership and control of funding. It focuses its efforts on a particular sector and is:

> *a process in which funding for the sector – whether internal or from donors – supports a single policy and expenditure programme, under government leadership, and adopting common approaches across the sector* (Farrington, 2001a).

Through an integrated framework SWAps aim to develop institutional processes including planning, management, accountability and finances associated with national sector policies, strategies and work-plans (DFID, 2001a; Farrington, 2001a). This is conducive therefore to large-scale reform. Ideally, a SWAp aims to consult with a variety of stakeholders across micro-, meso- and macro-levels.[5]

Thus, SWAps provide an integrated approach based in regulatory framework to manage collective resources for equitable development based on accessibility due to gender, geographical location, social group etc. (Brown et al., 2001).

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[5] In community development literature, micro-level stakeholders are the community, meso- stakeholders are the community development agencies and macro- are the policy-level institutions.

For example, in an engineering community development scenario, Uganda's move towards a sector-wide approach to its water and sanitation sector saw the development of a National Water Policy and the reform of four sub-sectors: rural water supply and sanitation (WSS); urban water supply and sanitation; water for production; and water resources management (Robinson, 2002). The change in the rural WSS sub-sector, led by the Government of Uganda itself, concentrated on strengthening the sector's ability to provide services through a decentralised process, building the technical capacity of local and district authorities, developing demand-responsive programmes, community education, participatory planning, community funding for operations and maintenance and developing a long-term investment plan. These changes included involving the community, local and district authorities and the private sector.

Critics of SWAps view it largely as a top-down, non-participatory process whereby aid focuses on the *perceived* needs of the community (Akroyd and Duncan, 1998; Brown et al., 2001; Foster and Mackintosh-Walker, 2001). They argue that what is therefore needed is a bottom-up approach identifying the livelihood outcomes as perceived not by the sector, but by the community (DFID, 2000a; Gilling et al., 2001). Further, having established this approach in national regulatory processes, SWAPs require, as noted by DFID (2001), "*a stable, enabling policy environment, transparent and accountable government organizations, and strong political will among both donors and government*". Additionally, a high level of coordination is needed between government and donors. In unstable political environments, however, such dependence on government bodies can be difficult.

2.5.2. Rights-based approach

Extensive literature on RBAs agree on a common definition of the approach:

> *empowers poor communities to claim and exercise their rights and enables those responsible to fulfil their duties* (CARE International, 2004b).

These rights include not only civil and political rights, such as freedom of speech, political affiliation and assembly, and religious and security rights, such as the rights of personal freedom, but also social, cultural and economic rights, such as rights to a livelihood, access land, shelter, education and health (DFID, 2001b; CARE, 2001).

Typical principles addressed by RBAs include:

- people-centred development;
- community and stakeholder participation;
- awareness of social differentiation and non-discrimination;
- equality, including resource equity across all groups, with special attention to the needs of vulnerable groups including gender and ethnic minority groups;
- capacity building and empowerment amongst all groups including government, stakeholders and the poor;
- increasing accountability and transparency of government organisations and stakeholders;
- addressing power dynamics;
- rights and responsibilities of the government, stakeholders and the community; and
- priorities between public goods for diverse community groups (CARE, 2001; UNHCR, 2002; Adams, 2003).

Empowering the communities to ensure their ability to claim their entitlements through RBAs involves raising awareness regarding their rights and developing their capacity. This will help to enable both the individual and the community to participate in political processes. The greatest difference from alternative community development approaches is that the poor community is no longer viewed as recipients or even participants, but as citizens with legal access to rights and responsibilities to fulfil in order to obtain such rights (Eyben, 2003).

An example of a RBA in a water scenario addresses the restrictions to access faced by the diversity of groups in a community (WaterAid & Rights and Humanity, 2003). Legal instruments such as national laws, International Humanitarian Law and Geneva Conventions promote this right to water. In all circumstances, regardless of local resources, a human-rights approach acknowledges and formulates its activities around three key points to the right to water:

Availability

Each person has the right to a water supply that is sufficient and continuous for personal and domestic uses

Quality

This means that the water required for each personal or domestic use must be ***safe*** *and therefore free from micro-organisms, chemical substances and radiological hazards that constitute a threat to a person's health. Furthermore, water should be of an* ***acceptable colour, odour and taste for each personal or domestic use.***

Accessibility

(i) Physical accessibility

(ii) Economic accessibility

(iii) Non-discrimination

(iv) Information accessibility (WaterAid & Rights and Humanity, 2003)

Some of the problems and challenges associated with implementing RBAs to development have been identified:

- isolated assessments of rights;
- no easy answers: trade-offs remain;
- realisation of goals;
- imposing western values or rights;
- clash between collective and individual rights;
- heterogeneity of cultural and ethnic rights;
- integrating macro-policy and micro-action; and
- implementing through weak legal and governmental systems (CARE, 2001; Nguyen, 2002; Raworth, 2002; Eyben, 2003).

2.5.3. Sustainable livelihoods approach

Early works in integrated community development approaches (Chambers and Conway, 1992; Conway and Miles, 1988) and a response to the UK Government's 1997 *White Paper on International Development* led to the initial sustainable livelihoods (SL) approach. A sustainable livelihood is:

> *environmentally sustainable when it maintains or enhances the local and global assets in which livelihoods depend, and has net beneficial effects on other livelihoods. A livelihood is socially sustainable when it can cope with and recover from stress and shocks, and provide for future generations* (Chambers and Conway, 1992).

The aim of the SL approach is to enhance capability in facing change and unpredictability, improve equity and increase social sustainability by reducing external stress and shocks by providing safety nets (Solesbury, 2003). The key concepts of SL are:

- holistic development describing all geographical and social groups, external influences, livelihood strategies, outcomes and players;
- dynamic, flexible development to allow for continual feedback, learning and adaptation of the model;
- development building on strengths, rather than needs;
- investigation of micro-macro links, emphasising the importance of the interactions between macro level policy and institutions and the options of communities and livelihoods;
- sustainability in environmental, institutional, social and economic systems; and
- people-centred development rather than resource- or government-centred.

For example, in an energy-focused SL programme, there is diversity in the range of support that can be provided as prioritised by the community users. Policy can be affected to improve access to consistent networked supply for low-volume users for hospital refrigerators to allow for storage of vaccines and consequently improve health. Improved cookstoves can improve the health of the users, through reduced smoke inhalation and subsequent chest complaints, allowing more time for the users to participate in other activities such as improving social networks. Biomass briquettes replace the need for fuelwood for cooking, increasing the health of community forests, which in turn can be used to generate non-timber products, such as herbs, to be sold to increase incomes and financial sustainability.

2.5.4. Comparing approaches

In contrast to the top-down approach of SWAps, as discussed in section 2.5.1, SL uses a bottom-up, people-centred approach to allow the community to identify and prioritise livelihood strategies and goals (in contrast to the agenda of the public sector) to ensure greater sustainability of development, addressing the diversity of livelihoods encountered in most poor communities.

Where challenges to the success of the rights-based approach have been identified in section 2.5.2, the SL approach uses a strong community focus and builds on the strengths of the community to ensure the goals are within the capacity of each household of the community. The use of household skills, assets and priorities to ensure this realisation provides a richer basis for the success and sustainability of interventions, appropriate to each household, culture or ethnic group. The diversity amongst the community is identified and used in the intervention.

Whilst SWAps, RBAs and SL approach have similarities and differences, as summarised in Table 3, aspects of each approach can be combined to enhance each approach.

For example, the rights-based approach can be enhanced by the holistic nature of the SL approach. This ensures an analysis of the many dimensions of the lives of the poor, including beyond the formal political dimension of the rights-based approach, to help identify and prioritise the key areas to enhance livelihoods.

Table 3: Comparing modern community development approaches

Concept	SLA	SWAp	RBA
Management	Bottom-up people-centred, participatory and responsive.	Top-down, requiring integrated government and donor support.	People-centred and participatory.
Sustainability	Multiple dimensions of sustainability.	Little focus on sustainability.	Ensuring the rights of future generations introduces an element of sustainability, but is not an explicit focus.
Empowerment	Participatory approaches develop capacity in the community.	Capacity building focuses on government systems versus community systems.	Helping people to exercise their voice and so acquire immediate benefits and influence process of change and social transformation.
Participation	Participation is encouraged at all stages of projects.	Driven by central agendas and needs and capability of public centre.	The community must participate to recognise and claim its rights.
Accountability	Building macro-level processes and institutions is a key focus to enhancing livelihoods.	Public expenditure programme is designed to reflect macro-economic policy and sector priorities and strategies to enhance transparency and accountability.	Stakeholders need to be mutually accountable and responsible.

Concept	SLA	SWAp	RBA
Macro-micro links	Through links with policy-makers, policies can be developed reflective of the real community situation.	Policy is developed; plans then follow in a top-down approach.	Recognition of the obligations of the state to facilitate, provide and promote attainment of citizens' rights. Citizens also have rights to make claims on the state and each other, but also have responsibility to both.
Dynamic	Programme scope adapts to reflect the changing livelihood strategies and needs of the community.	Inadequate support for recurrent costs after project completion, preventing adaptation of long-term goals.	Recognition of the dynamic nature of relationships.
Sectoral scope	Multi-sectoral with many plans. Sectoral involvement evolves with plans.	By definition, these plans are limited to one sector.	Narrow sector scope.
Partnership	Local and national governments, non government organisations, community-based organisations and the private sector.	Government, donor and civil society groups partnerships.	Government and community have reciprocating relationships.
Holistic	Explores the connection between the typically fragmented dimensions of people's lives.		Analyse and understand power relations and root causes of poverty and suffering.

Concept	SLA	SWAp	RBA
Starting point	People and their existing strengths and constraints.	Driven by common vision and strategy of public sector.	Defining the rights and entitlements within which the poor can make their claims.
Problem analysis	Inclusive process, iterative and incomplete.	Policy and institutional analysis and development of a strong financial plan.	Human-rights analysis identifying the root causes of problems.
Scale	Start off small. Scaling up is difficult.	Large-scale impact. Scaling up is easy.	Large-scale impact. Scaling up is easy.

2.6.Overview of the SL approach

The SL approach aims to identify and develop the assets, strategies and strengths of poor groups across all sectors in order to meet the livelihood goals of the community users (Farrington, 2001b). The framework:

> *views people as operating in context of vulnerability. Within this context, they have access to certain assets or poverty reducing factors. These gain their meaning and value through the prevailing social, institutional and organizational environment. This environment also influences the livelihood strategies – ways of combining and using assets – that are open to people in pursuit of beneficial livelihood outcomes that meet their own livelihood objectives* (DFID, 2001b, section 1.1).

Figure 3 illustrates the DFID's livelihood framework. This framework is merely a conceptualisation of SL constructs, and can be adjusted to suit individual users' perceptions and approaches.

Sustainable livelihoods include consumption and income necessary for community livelihoods. More importantly, however, livelihoods are sustainable when they have the ability to handle stress and shocks and to satisfy basic needs (Chambers and Conway, 1992).

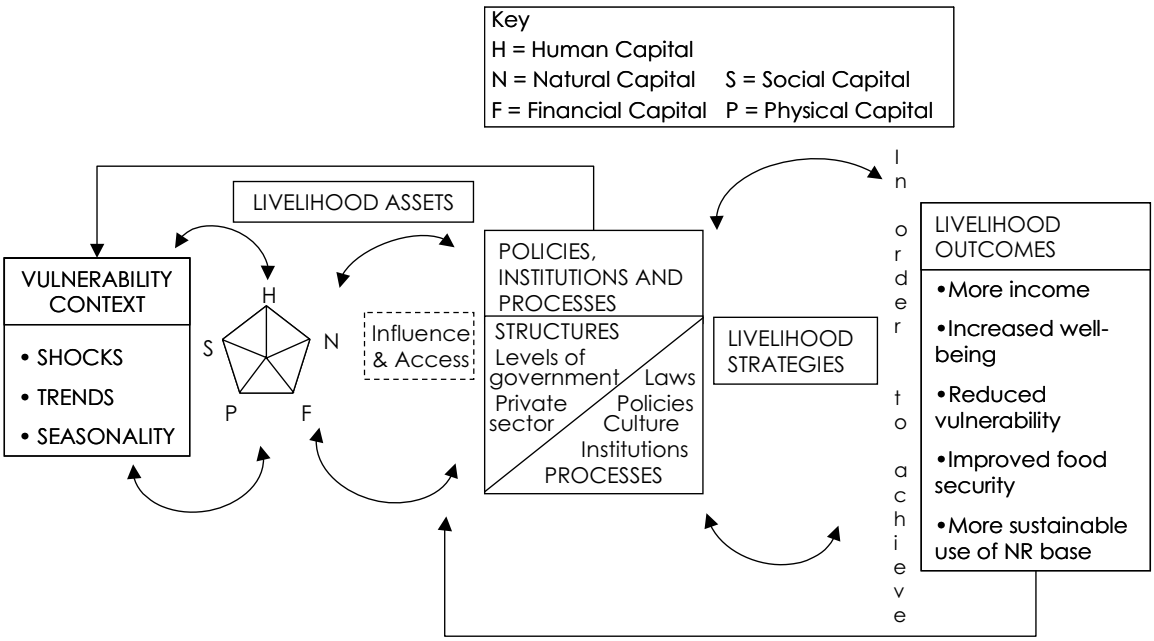
The manifestation of the core SL (as identified in section 2.5.3) concepts in practice include:

- empowering activities;
- responsive and participatory planning and implementation;
- activities conducted in partnerships between the poor and their organisations and the private and public sectors;
- disaggregated analysis including stakeholder and gender analyses;
- outcome-based monitoring and evaluation: and
- long-term and flexible programming (Carney, 2002).

Uses of the SL approach since the early works of Chambers (Chambers and Conway, 1992) include research and project work. Project work has included most phases, from identifying programme needs and the needs for programmes, designing and assessing

new and existing programmes, monitoring and evaluation to informing strategic thinking (Ashley and Carney, 1999; Farrington, 2001b).

Figure 3: Sustainable livelihoods framework



(adapted from DFID, 2002b)

2.6.1. Livelihood assets

The prime focus of SL is how people use their assets to enhance their livelihoods. The SL approach groups assets into the following categories:

- human capital such as skills, knowledge, the ability to labour and good health that allows livelihood objectives to be achieved;
- social capital such as networks and connectedness, membership of formalised groups or relationships of trust, reciprocity and exchanges;
- financial capital including available stocks and regular inflows of money;
- physical capital including the basic infrastructure and producer goods (or tools and equipment) used to function more effectively; and
- natural capital, which is the natural stocks that can be used in developing livelihood strategies, such as land, water, air quality, storm protection.

When investigating livelihood assets, it is important to establish the links between assets. Complementarity, non-substitutability (World Bank and Oxford University

Press, 2003), access, clustering, sequencing and trends in availability of assets (Scoones, 1998) help to determine appropriate strategies in strengthening the livelihood assets. Strengthening livelihood assets may be carried out through such strategies as reconstructing grassroots organisations, transforming relationships between the community and local governments, developing collective knowledge and skills or redeveloping urban infrastructure (Mitlin, 2002).

2.6.2. Vulnerability context

The vulnerability context in the SL framework is part of the social sustainability of people. It frames their ability to withstand shocks, trends and seasonality over which they have little or no control (DFID, 2001b). Examples of such external influences are provided in Table 4.

Table 4: Framing the vulnerability context

Trends	**Shocks**	**Seasonality**
Resources	Natural	Employment opportunities
Technological	Economic	Prices
Governance	Crop/livestock health	Production
Population	Conflict	Health

(adapted from DFID, 2001b)

2.6.3. Policies, institutions and processes

The transforming structures and processes as they were known previously in SL, are the policies, institutions and processes (PIPs) that shape livelihoods. In contrast to the vulnerability context, which relates to the external influences on livelihoods, PIPs are internal to the community. PIPs include the public and private sectors, policies, legislation, institutions, culture and norms, and power relations including age, gender, class and caste (DFID, 2001b). PIPs may be formalised in writing, or may be informal 'rules of the game'.

Bingen (2000) has grouped institutions into the following categories, each category comprising of both formal and informal institutions:

- familial (cultural) institutions, based on descent or kin relationships;

- communal (community) institutions, based on trust and reciprocity;
- social institutions, based on societal interest;
- collective institutions, based on contractual interest; and
- policy/governance institutions based on legislature and regulations.

Three characteristics of PIPs affect their management and use: there are no limits on time or the spatial location of PIPs. Often, PIPs may influence livelihoods throughout the life of people, and may be geographically removed; PIPs may overlap or be nested within other PIPs; and there are no hierarchical relationships between PIPs (Bingen, 2000).

It is important to define and acknowledge the role that existing PIPs play in providing essential goods and services to vulnerable communities, such as access to assets and mitigating adverse consequences of civil strife. In the process of developing sustainable livelihoods it is vital that these roles are not diminished (Marsh, 2002). Therefore, approaches to change within local institutions should commit substantial time to understanding the local framework, and aim to enhance the existing framework rather than developing a new, possibly competing, framework from the ground up.

2.6.4. Livelihood strategies

In order to promote choice, opportunity and diversity in their livelihoods, people choose a variety of activities and strategies, including productive activities, investment strategies and reproductive choices (DFID, 2001b). In rural communities, livelihood strategies may include diversification, migration and agricultural intensification (Hussein and Nelson, 1998). Agriculturally, livelihood strategies may include short-term yield-enhancing strategies, or longer-term soil improvement or conservation strategies (Twomlow et al., 2002).

The use of the SL approach aims to enhance livelihood strategies, rather than change them. By understanding the factors that direct peoples' choices towards particular strategies it is possible to then reinforce the factors that promote flexibility within these strategies (DFID, 2001b). Negative influences or constraints, such as inadequate market access, degraded natural resources or climatic risk or uncertainty can be mitigated against. This approach helps to develop sustainability and flexibility within livelihood strategies.

2.6.5. Livelihood outcomes

Livelihood outcomes, the output of livelihood strategies, are those goals that people pursue. As with livelihood strategies, the SL approach aims not to change the outcomes of the community, rather to identify and strengthen the priorities within people's lives. Where a community prioritises increased education, for example, the SL approach will not aim merely to provide electricity, but to ensure that electricity is available at appropriate times and locations to enhance learning opportunities. The SL approach provides examples of livelihood outcomes:

- more income;
- increased well-being;
- reduced vulnerability;
- improved food security; and
- more sustainable use of the natural resource base.

2.6.6. "Best practice" for engineering and sustainable livelihoods

From the SL literature, it is evident that this approach affects several key aspects of practice for community development practitioners. These are explored corresponding to those dimensions of SL in community development of section 2.3.3. Whilst there is little detail of practice for SL for community development specific to engineers, the role of technology for SL is specifically explored.

2.6.6.1.Management

Management focuses on longer-term programmes, through the cohesion of multiple short-term projects (Harpman and Anelay, 1999). SL activities have wider participation from the community and donors, greater costs and broader development objectives. These smaller, more manageable projects allow greater access by local contractors and workers, reduce the risk and enhance partnership relationships.

Costs within the SL approach are balanced within the social and economic spheres of the target community to ensure sustainability (Sustainable Livelihoods Unit, 1999). Fixed budgets are less common. Ongoing maintenance and monitoring costs are factored in to the original budget planning and scheduling.

Transparency and accountability are developed from the top downwards as well as from the bottom upwards. This enhances the visibility of processes and develops trust with all stakeholders (Chambers et al., 2001).

Risk is analysed based on the balance between the macro-, micro- and meso- policies of the target community.

SL activities develop people (rather than services) in a bottom-up approach to meet the demands of the community (Hobley, 2000). The bottom-up approach helps build capacity in the local community for longer-term sustainability. The “frontline” staff work as facilitators rather than directors with the local communities. The language of these activities is then focused on power-building rather than solely technical (Chambers et al., 2001).

Partnerships are developed to further build capacity and to overcome geographical and resource limitations. Greater micro-macro links within organisations facilitate the delivery of programmes under the SL approach. Decentralisation of decision-makers ensures greater participation by the target community and greater responsiveness to the needs of the community (Hyden, 1998; Pasteur, 2002).

Timing attempts to reflect the progress of poverty and development with time (Hobley, 2000) and makes allowance for unplanned occurrences such as environmental disasters or political unrest. Workforce numbers are developed with reference to seasonal activities, such as subsistence activities like crop-planting or harvesting or religious festivals.

The period allocated to programme/project planning is extended to allow for sufficient community consultation and participation and for the development of partnerships. The project does not end at the completion of construction, or the provision of service. Instead, ongoing monitoring is included in the timeline of the programme, as discussed in section 2.6.6.4.

Participation

Community participation is a key methodology in project management for SL. This aims to increase community ownership of SL activities, build capacity of governments, NGOs and the community, and to ensure that objectives are appropriate to the community being served.

Most importantly, participation must be representative of the most vulnerable groups in the community to ensure that their needs are being met according to their assets, their strengths and their livelihood strategies. The importance of participation is highlighted by the World Bank (Blackburn et al., 2000) as it develops ownership and partnerships from the beginning of programmes.

Community participation ranges from self-mobilisation, where the community takes the initiative independent of external institutions to participation for material incentives, participation by consultation and manipulative participation where community participants have no power and participation is merely pretence (Franks et al., 2004).

Partnerships

As previously noted, partnerships are a key to programme management and programme development. In practice, however, the extent, contribution and power of each of the partners differs, affecting the sustainability and effectiveness of the partnership.

2.6.6.2.Skills

Community development programmes require a broader range of skills to reflect the holistic nature of development. Skills such as participatory development, training, empowerment, capacity-building, institutional building, micro-economics and governance will facilitate longer-term sustainability (Narayan, 1995; Ashley and Carney, 1999; Organisation for Economic Co-operation and Development, 2001).

2.6.6.3.Design and technology

The role of technology for SL is defined by the Sustainable Livelihoods Unit (1999):

- *improve the productivity of a community's assets;*
- *enhance capabilities and provide for new livelihood opportunities for the poor;*
- *are sustainable in an environmental and socio-economic sense;*
- *empower communities especially vulnerable groups within this sector; and*
- *promote macro-meso-micro linkages between relevant stakeholders through appropriate networks.*

Again, community participation and partnerships are a key component of design and technology. Programme design is focused on community participation to determine the needs, adaptive strategies and assets of the target community to ensure social and environmental sustainability (Sustainable Livelihoods Unit, 1999).

Technology with an SL approach aims to increase productivity of all materials through the life-cycle of both the programme and the material (Sustainable Livelihoods Unit, 1999), so as to enhance all asset groups rather than contribute waste products and energy.

Finally, a balance between the advantages and disadvantages in all asset areas from the implementation of technology must be met. This further enforces the idea that there is no one right solution and that technology must be developed appropriate to each community user.

2.6.6.4.Evaluation and monitoring

Indicators for monitoring and evaluation that demonstrate the level of acceptance and ownership of the programme by the community are effective within the SL framework. Thus, as the programme develops and objectives change, so too do the indicators.

Evaluation and monitoring of the programme will be accessible and representative of the status of the most vulnerable in the community (Harpman and Anelay, 1999). Participation by the community will enhance the long-term sustainability, and verify the suitability of the indicators used.

2.7.Background to methodology

Soft systems methodology, with its participatory approach and ability to address the complexity of the engineering and community development sectors, has been used to guide the methodology for the analysis phase of this research. A background to this methodology has been provided.

2.7.1. Systems thinking

Systems thinking has been developed and expanded to increase understanding and the capacity to deal with an increasingly complex and changing environment (Maani and Cavana, 2000). Systems thinking bases its formulation on three concepts, the basis of these being systemic, or emergent properties and the relationships surrounding these

emergent properties. As defined by Checkland and Scholes (1999), systemic refers to a complex whole that:

> *may have properties which refer to the whole and are meaningless in terms of the parts which make up the whole.*

Emergent properties, which are attributable only to the whole, not the individual parts, may be defined by variables in smaller wholes in many different layers in the system. This is known as a hierarchy in systems thinking. Finally, in order for systems or wholes to survive in environments of increasing complexity and change, control and communication are considered necessary in systems thinking (Checkland and Scholes, 1999).

2.7.2. A review of systems engineering

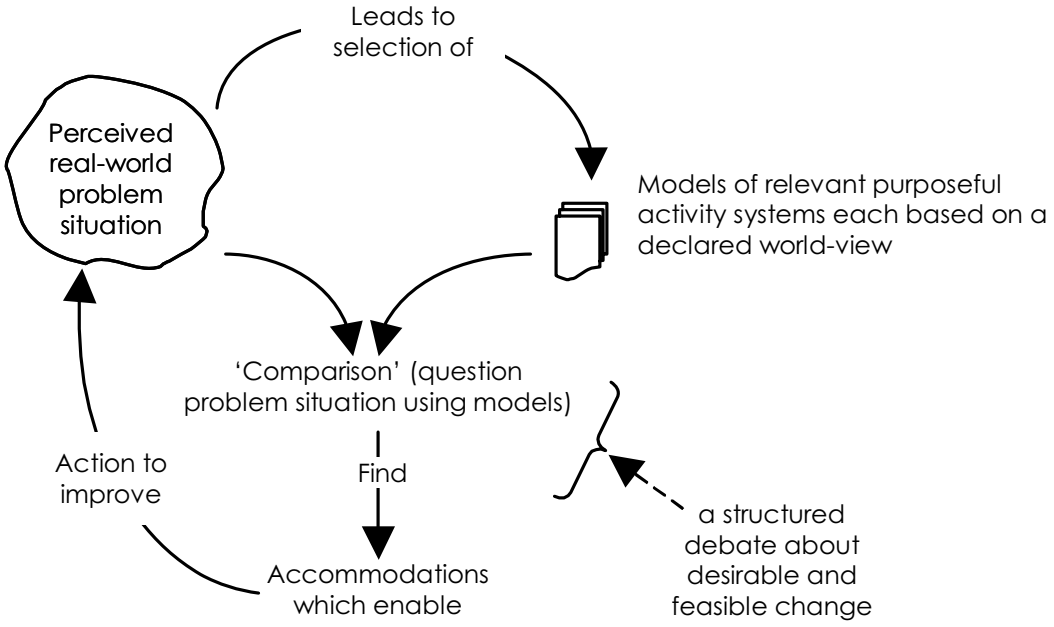
Traditional systems engineering has been used in the analyses of projects where the objectives and methods of achieving these are well-defined, neutral and generally quantitative (Crawford et al., 2003). The problem itself is a system that can be engineered. However, increasingly, these projects are becoming less common, and where objectives were well defined, they are now obscure, ill-structured and amorphous. Further, the involvement of the human aspect in more of these projects introduces additional variables such as culture, attitudes and values, which are likely to change with time throughout the analyses. These complexities and divergences of values and beliefs result in the definition of not only many problem situations, but also many objectives for each problem situation, defined by the variety of stakeholders. The desired outcomes are unlikely to be defined quantitatively, rather qualitatively. The ability to define a system and/or its objectives is lost, and traditional 'hard' systems engineering loses its relevancy. Soft systems thinking was developed to address these methodological shortcomings. It places people at the centre of the analyses and allows for interpretation of subjectivity, multiple views and learning. It allows the development of insight into qualitative systems. The key difference between soft and hard systems thinking is that hard systems engineering perceives *the world* to be a system or holon. That is, it has emergent properties and hierarchy and processes of communication and control. However, soft systems methodology assumes *the methodology or process of enquiry* to be systemic, in order to address all possible messy boundaries and layers of variables in complex problem situations.

2.7.3. Soft systems methodology

Soft systems methodology (SSM) was developed by Checkland and Scholes (1999) over more than 30 years to deal with complex problem situations that are ill structured and defined differently by different actors.

Checkland and Scholes (1999) use the concept "epistemology" to define how the constantly changing and complex nature of reality, which cannot inherently be systemic, can be modelled using systems theory. Soft systems thinking uses the term "holon" to describe, and therefore model and explore reality *as if it were a system*. Figure 4 illustrates the process of SSM, of developing models of the ideal operation of the problem situation, comparing this to the reality and developing systemically feasible and culturally desirable changes. SSM tools, used in particular to systemically develop and analyse such models, include rich pictures, root definitions and social, political and intervention analyses.

Figure 4: The SSM process



(adapted from Checkland and Scholes, 1999)

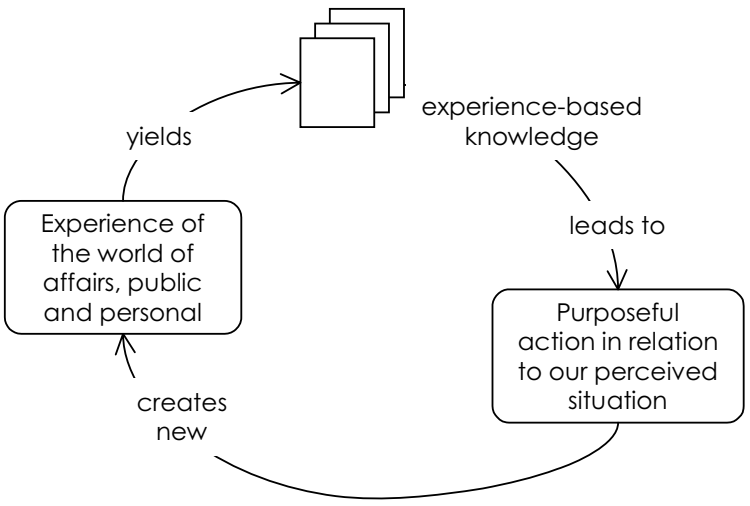
2.8. Justification of methodology

In order to match a methodology to the research, the possible problem situations were mapped against two axes: unitary/pluralist/coercive and simple/complex (Flood and Jackson, 1991). Whilst the research was established in conjunction with the NGO, the commercial nature and practice of the NGO were likely to result in differing values and

actions between the researcher and the NGO throughout the research, defining the participant relationship as closer to the 'pluralist' type. Further, as discussed in the following sections, engineering in community development and the participatory approaches favoured by the SL approach are highly complex situations with many elements, stakeholders and interactions; change occurs over time (and space) in these 'problem situations'; they have purposeful subsystems; and they are open to behavioural and environmental influences. Therefore, by Flood and Jackson's (1991) Total Systems Intervention approach to selecting methodologies, SSM was selected as an appropriate systems methodology to guide the analysis phase of the research.

Additionally, the participatory nature of SSM increases its usability to ensure a learning organisation is left behind for long-term sustainable practices. It is based on a cycle of action and experience, as illustrated in Figure 5, which lends itself directly to learning for participants of the cycle. This is invaluable to action research that cannot continue endlessly, ensuring that research participants are able to continue the reflective behaviour beyond the scope of the research.

Figure 5: Experience and action cycle of SSM



(adapted from Checkland and Scholes, 1999)

2.8.1. Complexity in engineering

Whilst SSM case studies are seen largely in scenarios of great complexity, such as human and resource management, information technology, research, training and knowledge management, examples exist from the more traditional domain of hard

systems thinking in infrastructure and engineering. The practice of soft systems for engineering problems is also starting to emerge. One study in particular readily acknowledges the enormity and diversity of components and stakeholders in a mass transport system, the need to focus on human requirements and the ability of the system to grow and change into the future (Yeo, 1995). A growing environmental awareness and its corresponding visible public support, political factions and private funding are also implicating greater 'messiness' in infrastructure design and provision (Neal, 1995). In process engineering, human factors and safety are emerging as dominant design factors, over and above technology (Kirwan, 2000).

Thus, in engineering/infrastructure practice the balancing act between social, political, environmental and technological spheres results in numerous complex computations. The expanding use of SSM in such balancing acts has proven its role in these environments.

2.8.2. Complexity in community development

The multidimensionality of community development creates problem situations with many stakeholders across a variety of sectors and environments.

Due to the far-reaching effects of political, social and environmental arenas, community development activities are affected not only on a local scale, but also on a global scale. This introduces high degrees of complexity, characterised by uncertainty, instability, diversity, irrationality, fractured and multiple interest groups, immeasurability and non-linearity (Edwards, 1997; Pasteur, 2004). An inability to translate approaches and solutions further increases the challenges in the community development sector. Where an intervention or approach may be successful in one situation, it cannot be taken for granted that the same intervention or approach can be applied universally across all community development activities (Sanga and Nally, 2002).

Partnerships and interactions between development agencies with different missions, approaches, hierarchies, cultures and sizes further heighten the intricacies in community development (Roper and Pettit, 2002).

Community development activities are also impacted upon by varying rates of environmental and human induced changes. Long-term human impacts on air, water, land and biodiversity often manifest themselves slowly (Hodge et al., 1999). At nature's

threshold of change, the impacts often occur rapidly, but just as often, take vast amounts of time for recovery.

As complexity in community development environments increase, there are not only more variables in each discipline to be explored, but more disciplines to be incorporated into the problem. The expansion in the number of disciplines, and the holistic nature of sustainability and the SL approach aligns with systems engineering.

Thus, the role of SSM in community development is invaluable to effectively identify priorities, stakeholders and limitations from amongst an enormous diversity of issues.

2.8.3. Complexity and participation

The SL approach acknowledges the immense value of participation for effective and sustainable change. There is great diversity across stakeholders, politically, socially, historically, economically and culturally, and without the integration of this, approaches to development and change are less likely to be sustainable. It is also acknowledged that across stakeholders in such scenarios there can be an unequal balance of power, and as such, it is important to ensure that the most vulnerable are heard and their needs met, again highlighting the need for, and complexity of, participation (DFID, 2001b; White, 2003).

CHAPTER 3. RESEARCH CONTEXT

As discussed in Chapter 1, this research aims to explore best practice for SL in engineering organisations. Data was collected during a period of twelve months from October 2003 to October 2004, during which time the researcher worked in Nepal.

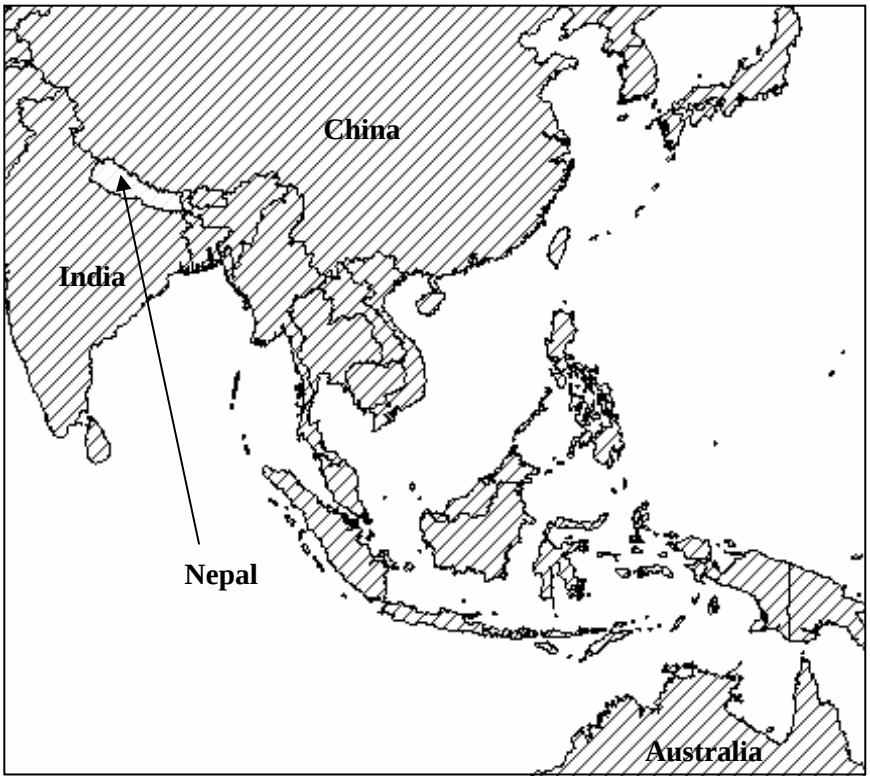
Due to the opportunities and limitations offered by the external environment to the success of community development organisations, the geographical, social, political and economical contexts are briefly characterised. The extent of poverty in Nepal and the nature of community development, specifically infrastructure development, is then explored.

3.1.Nepal country context

3.1.1. Geographical situation

Nepal covers an area of 147,293 square kilometres, situated between China to the north, and India to the west, south and east, as shown in Figure 6. From an elevation of 8,884 metres on its northern border with China to sea-level elevations in the south, Nepal's geography ranges from high mountains in the north, to mid hills across the centre, to low-lying plains (terai) in the south across a distance of approximately 180 kilometres.

Figure 6: Location of Nepal



3.1.2. Social climate

Nepal, as of 2003, has a population of 25,164,000 (Plan Nepal, 2005) and an annual growth rate of 2.3% (NGO Forum for Urban Water and Sanitation, 2004).

The complex social environment of Nepal is due to the heterogeneities of caste and ethnic groups. A 2001 survey listed 105 caste and ethnic groups, with densities varying between geographical regions (Sharma, 2003). The largest groups are Chhetri, Hill Brahmin, Magar, Tharu, Tamang, Newar, Muslim, Kami, Yadav, Rai and Gurung. Across these groups a total of 126 languages have been identified, three of which are extinct (Ethnologue: Languages of the World, 2005). Nepali is the official language of the country. Eight religious groups have also been identified, including Hindu, Buddhist, Islam and Kirat (Dahal, 2003).

3.1.3. Political climate

Nepal's political environment has undergone dramatic changes in the past century. A Rana regime[6] was in place until the early 1950s, followed by a royal autocracy in 1960 AD.[7] A people-led movement for multiparty democracy with a constitutional monarchy began in 1990 and was still in place at the time of this research (DFID, 2004a). Under this system legislation was developed and implemented through a two-tier system: the upper house (Rastriya Sabha) with 60 members, and the lower house (Pratinidhi Sabha) with 205 elected representatives from the 75 administrative District Development Committees (DDCs) across Nepal (NPC, year unknown). Each district is divided further into Village Development Committees (VDCs) in the rural areas and Municipalities in the urban areas. There are currently 3,915 VDCs and 58 Municipalities. These administrative districts are further divided into between 9 and 35 wards. For community development agendas Nepal is divided into five development regions: East, Central, West, Mid West and Far West (NPC, 2004a).

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[6] The Rana regime, an autocratic regime led by one family, had been in place since 1856 AD (Network, 2005).

[7] In the Nepali calendar, Bikram Sambat, the year 2005 AD is equivalent to 2062 BS (Nepal Home Page, year unknown). The Gregorian Calendar is, however, used for this research.

The Maoist insurgency, which started in 1996, is occurring in parallel to the formal political system. This direct conflict with the government affects the economy, security, polity and development of Nepal (HMG Nepal and United Nations Country Team of Nepal, 2002).

3.1.4. Economic climate

The currency of Nepal is the Nepali Rupee (NRs), where one dollar (US$1) was equivalent to 72.982 NRs at the time of this research (8th June 2005) (Oanda.com, 2005).

The principal means of income for the greater proportion of the population is low-productivity agriculture. More than 70% of the population relies wholly or partially on subsistence agriculture, with 64.3% operating their own farm and 6.8% earning a livelihood from another person's farm (NPC, 2004a). However, agriculture accounts for less than 40% of the GDP, a decrease of 28% in the last twenty years (HMG Nepal and United Nations Country Team of Nepal, 2002) illustrating little synergy between employment and the economic sector. Across Nepal unemployment is at 5% and underemployment is at 32.3% (NPC, 2004a).

Textiles, tourism, hydropower, manufacturing and remittances are the staples of the modern cash economy of Nepal (NGO Forum for Urban Water and Sanitation, 2004).

In order to meet the intended poverty targets, His Majesty's Government of Nepal (HMGN) aims for an overall growth GDP of 7% until 2017. However, based on previous performance, even the proposed 6.2% rate is optimistic. This rate is proportioned to 4.1% for the agricultural sector and 7.5% for the non-agricultural sector. Table 5 summarises the sector-wise contribution to the GDP for the Tenth Plan, highlighting the dominance of electricity, gas and water services and social services in achieving the overall intended growth.

Table 5: The sector-wise value addition for the GDP of the Tenth Plan

Sectors	Estimated GDP of 2006/07		Annual growth rate of 10th Plan (%)
	Production (NRs) *	%	
Agriculture, irrigation and forestry	19,369.38	35.58	4.1
Non-agriculture			
Industry mines	5,074.68	9.32	7.8
Electricity, gas and water	1,398.33	2.57	11.1
Construction	6,171.59	11.35	7.9
Commerce, hotels & restaurants	5,744.91	10.55	7.3
Transportation & communication	5,022.93	9.23	7.7
Finance and real estate	5,630.81	10.34	5.3
Social services	6,016.61	11.05	8.1
GDP (at factor cost)	54,434.25	100.0	6.2

* At fixed 2001/02 price in Crores, 6.2% growth rate: 1 crore is equivalent to 10,000,000 Nepali Rupees; Exchange rate at 01/01/2002: US$1 =80.113 Nepali Rupees (Oanda.com, 2005)

(adapted from NPC, 2002)

3.2.Poverty in Nepal

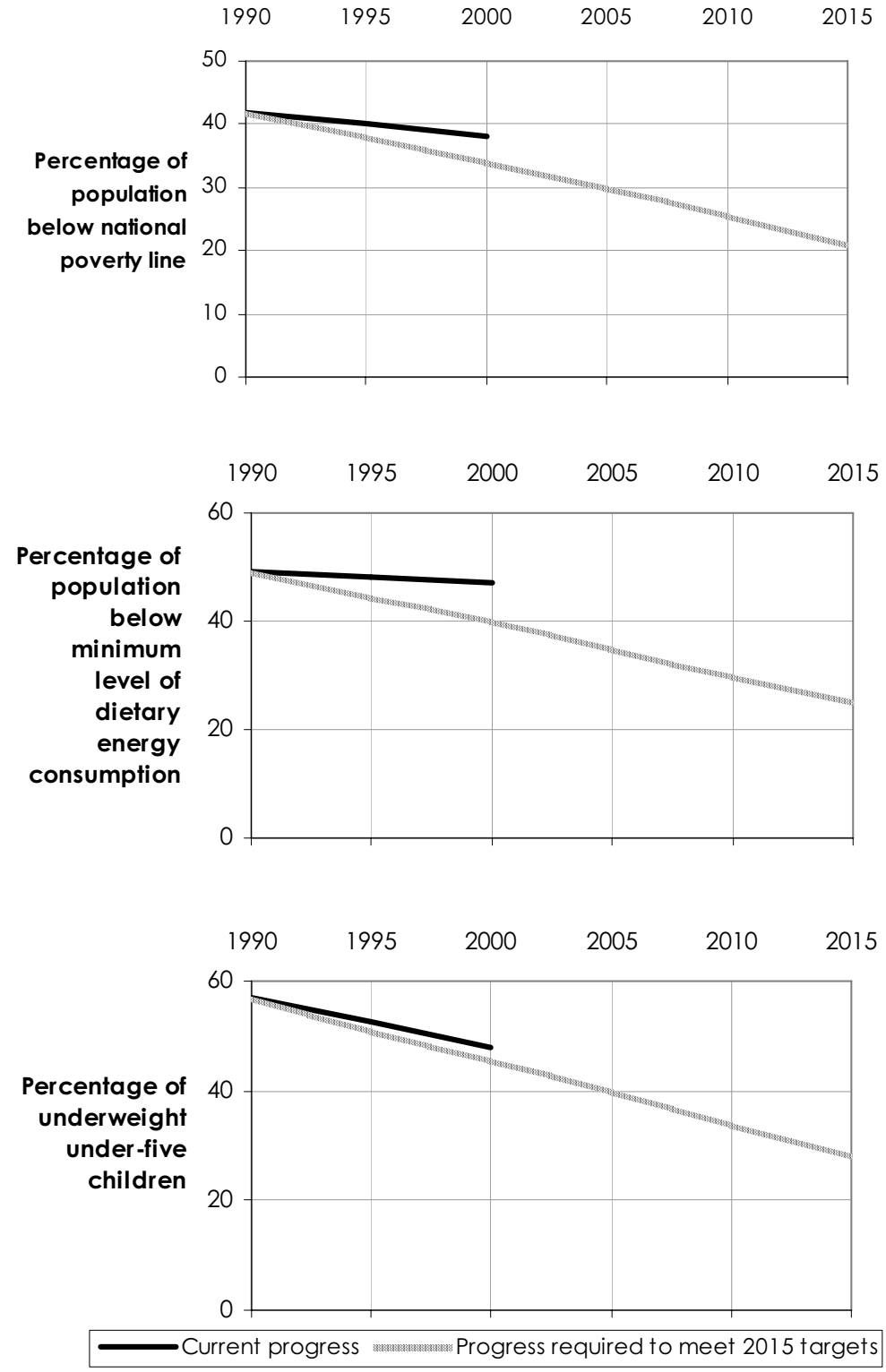
With a gross national product (GNP) of US$250 per annum, nearly two in five Nepalis are living below the national poverty line (DFID, 2004a). Table 6 summarises the most recent key development indicators for Nepal. Figure 7 shows how the current progress in reducing three of these indicators is insufficient to meet Nepal's 2015 MDG targets.

Table 6: Key development indicators

Indicator	Value	Year
Population size (million)	23.2	2001
Population growth rate (%)	2.27	2001
Life expectancy at birth (years)	59.7	2001
Human Development Index (value)	0.466	2000
Human Development Index (rank)	129.0	1999
Percentage of population below national poverty line (%)	38.0	2000
Total outstanding loans as % of GDP (%)	64.6	1998/99
Prevalence of HIV/AIDS in adult population aged 15–49 years (%)	0.29	1999
Population without access to drinking water supply (%)	20.1	2001
Percentage of underweight under-five children (%)	48.3	2000
Adult literacy rate (%)	57.6	2000
Net enrolment in primary education (%)	72.1	1999
Ratio of girls to boys in primary education (%)	74.0	1999
Under five mortality rate (per 1,000 live births)	91.0	2001
Maternal mortality rate (per 100,000 live births)	539.0	1996
Percentage of population relying on traditional fuels for energy (%)	92	1994/94

(adapted from HMG Nepal and United Nations Country Team of Nepal, 2002)

Figure 7: Progress and targets of Human Development Indicators



(adapted from HMG Nepal and United Nations Country Team of Nepal, 2002)

Poverty in Nepal is exacerbated by the diversity of castes and nationalities, each with different cultural identities, strengths and needs. Table 7 illustrates the difference in four human development indicators across several caste groups. It shows that whilst some caste groups are slightly above the national average for all development indicators, many groups, particularly the occupational, or untouchable caste group are well below the average for all of these indicators. It is without doubt that caste affects access to resources and services in Nepal (Hussein and Montagu, 2000). To date, this diversity has not been considered in many community development programmes leading to furthering the poverty cycle.

Table 7: Human Development Indicators on caste basis 1996

	Average life expectancy (yrs)	**Adult literacy rate (%)**	**Average years of schooling**	**Per capita relative income (NRs)**
Nepal	55	36.7	2.3	7673
Gurung, Magar, Sherpa, Rai Limbu	53	35.2	2	6607
Rajbanshi, Yadav, Tharu, Ahir	56.4	27.5	1.7	6911
Occupational caste group	50.3	23.8	1.2	4940

(adapted from NPC, 2002)

Women and children also tend to be excluded from programmes for poverty reduction in Nepal (HMG Nepal and United Nations Country Team of Nepal, 2002). Table 8 illustrates the difference in development levels between men and women for the year 2000. Whilst life expectancy for women has increased in recent times to be greater than that for men in many cases, women's literacy and schooling is a fraction of that for men.

Table 8: Gender and regional distribution of some Human Development Indicators

	Average life expectancy (yrs)		Adult literacy (%)		Average schooling (yrs)	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
High hills	48.6	51.1	62.9	26.6	3.71	1.33
Hills	65.4	64.7	72.3	39.5	3.97	2.18
Terai	61.7	63.2	60.2	32.5	3.71	1.93
Urban	71.4	70.8	81.2	56.9	6.01	3.8
Rural	58.2	59.3	63.6	32.3	3.4	1.66
Nepal	59.3	59.8	65.8	35.4	4.45	2.25

(adapted from NPC, 2002)

3.2.1. Community development policy

Planned community development in Nepal began in 1956 with the First Plan implemented by HMGN through the National Development Council (NDC) and the National Planning Commission (NPC) (NPC, 2002). The Plans implemented to date are summarised in Table 9, showing the transition from sectoral focuses to poverty alleviation. By the Ninth Plan, poverty alleviation was the sole focus of the Plan.

The most recent plan, the Tenth Plan, was developed as Nepal's Poverty Reduction Strategy Paper (PRSP), and was prioritised by the shorter-term Medium Term Expenditure Framework (MTEF) and Immediate Action Plan (IAP). The four pillars upon which the Tenth Plan is built are:

- high, sustainable and wide economic growth;
- development of social sectors and rural infrastructures;
- targeted programmes; and
- good governance.

Table 9: History of Nepal's development Plans

Plan	Date	Focus	Additional planning strategies
First Plan	1956–1961	Infrastructure, particularly roads and electricity	
Second Plan	1962–1965		
Third Plan	1965–1970		
Fourth Plan	1970–1975		
Fifth Plan	1975–1980	Agriculture and industry	
Sixth Plan	1980–1985	Agriculture and industry, poverty reduction	
Seventh Plan	1985–1990	Poverty reduction	
Eighth Plan	1992–1997	Poverty alleviation	
Ninth Plan	1997–2002	Poverty alleviation	Interim-Poverty Reduction Strategy Paper (I-PRSP/2001), Poverty Reduction Strategy Paper (PRSP/2002), Medium Term Expenditure Framework (Fiscal Year 2002/03–2004/05)
Tenth Plan	2002–2007	Poverty alleviation	Second Medium Term Expenditure Framework (Fiscal Year 2003/04–05/06), Poverty Reduction Strategy Paper of Nepal, Third Medium Term Expenditure Framework (Fiscal Year 2004/05–2006/07)
Eleventh Plan	2007–2012	Targets have already been set for these plans	
Twelfth Plan	2012–2017		

(adapted from NPC, 2004b)

The main objective of the Tenth Plan is:

> *to alleviate poverty by mobilising optimally the means and resources through participation of government, local agencies, non governmental sectors, private sector and civil society to extend economic opportunities and open new ones enlarging employment opportunities and widen the access to means and economic achievements for women occupational castes (Dalits), peoples of remote areas and poor and backward groups through programmes like empowerment, human development, security and targeted projects there by to improve the status of overall economic, human and social indicator* (NPC, 2002).

Both the World Bank and the International Monetary Fund have approved the PRSP which aims to reduce overall poverty in Nepal from 38% to 30% (DFID, 2004a). Table 10 summarises some of the key macro-economic and social targets for the Tenth Plan through to the Twelfth Plan, the final one currently formulated. These show optimistic targets based on growth rates significantly greater than previous performance.

Table 10: Progression of key targets

Targets	**Status of Ninth Plan**	**Targets of Tenth Plan**	**Target up to Twelfth Plan (2016/17)**
1. Annual economic growth rate (at factor cost) (%)	3.6	6.2	8.3
Agriculture	3.3	4.1	5.0
Non-agriculture	3.9	7.5	9.7
2. Ratio of national saving/GDP (%)	17.4	23.1	30
3. Ratio of investment/GDP (%)			34
Major social targets			
1. Child mortality rate (per ‘000)	64.2	45	34.4
2. Total fertility rate (%)	4.1	3.5	3.05
3. Maternity mortality rate (per ’00 000)	415	300	250
4. Primary education (%)	80.4	90	100
5. Literacy rate (above 15 years of age)	49.2	63	100

Targets	Status of Ninth Plan	Targets of Tenth Plan	Target up to Twelfth Plan (2016/17)
6. Female literacy rate (above 15 years of age)	35.6	55	100
7. Population below poverty line (%)	38%	30%	10
8. Population growth rate (%)	2.25	2.1	1.5
9. Average life expectancy (yr)	61.9	65	

(adapted from NPC, 2002)

The implementation of this Plan by HMGN is supported by a variety of Ministries, including the Ministry of Local Development, Ministry of Agriculture, Ministry of Physical Planning and Works, Ministry of Women, Children and Social Welfare, Ministry of Water Resources, Ministry of Forest and Soil Conservation and the Poverty Alleviation Fund (NPC, 2002).

3.2.1.1.Funding

Nepal relies heavily on funding from international sources for community development activities (HMG Nepal and United Nations Country Team of Nepal, 2002). Close to 35% of the annual budget is from foreign aid. Japan, the World Bank and the Asian Development Bank account for over half of this aid. Nepal has a high dependency on such financial support and has been in receipt of such funds since the early 1950s (Paudyal, 2003).

Table 11 illustrates the proportion of the total development investment of the Tenth Plan allocated to each sector, showing the dominance of the social services and agricultural, irrigation and forestry (adapted from NPC, 2002).

Table 12 summarises the proposed sources of income for this investment, showing that foreign aid represents 21% of the proposed spending.

Table 11: Sector-wise allocation of total development investment for the Tenth Plan

Sector	Proposed in Tenth Plan	
	Amount (NRs) **	Percentage
Agriculture, irrigation and forestry	5,621.0	24.0
Non-agriculture		
Industry and mines	227.1	1.0
Electricity, gas and water	3,600.4	15.4
Commerce, hotel and restaurant	351.1	1.5
Transport and communication	3,642.8	15.6
Finance and real estate	274.6	1.2
Social services	9,038.6	38.6
Miscellaneous *	647.3	2.8

*Including expenditure on economic and revenue administration, general administration, projects and statistics, science and technology, supply, constitutional bodies and other various economic sectors

**At fixed 2001/02 price in crores, 6.2% growth rate: 1 crore is equivalent to 10,000,000 Nepali Rupees; Exchange rate at 01/01/2002: US$1 =80.113 Nepali Rupees (Oanda.com, 2005)

(adapted from NPC, 2002)

Table 12: Sources of fixed capital investment expenditure in the Tenth Plan

Sector	Amount (NRs) *	Percent
Gross investment	64,076	
Fixed capital investment	60,982	100.0
Public sector	44,009	(72.2)
Private Sector	16,974	(27.8)
Change in cash balance	3,094	
Gross resources	64,076	100.0
National savings	50,614	(79.0)

Sector	Amount (NRs) *	Percent
Foreign aid	13,462	(21.0)
Revenue	32,116	
Gross expenditure	50,520	100.0
Regular expenditure	27,117	(53.7)
Development expenditure	23,403	(46.3)
Sources of development expenditure		100.0
Revenue savings	4,999	(7.4)
Foreign aid		
Grants	5,385	(7.9)
Debits	8,077	(11.9)
Internal debits	49,541	(72.9)

*At fixed 2001/02 price in crores, 6.2% growth rate: 1 crore is equivalent to 10,000,000 Nepali Rupees; Exchange rate at 01/01/2002: US$1 =80.113 Nepali Rupees (Oanda.com, 2005)

(adapted from NPC, 2002)

3.2.1.2.Key sustainable livelihoods organisations of Nepal

The visibility of the SL approach in Nepal remains low. Four main programmes were operating in Nepal at the time of the research:

(i) DFID is a key proponent for the SL approach. The Livelihoods and Forestry Programme (LFP) is one of DFID's major programmes operating largely in the southern regions of the country. The purpose of this ten-year programme is to enhance the asset base of rural communities through *"more equitable, efficient and sustainable use of forest resources"* (Messerschmidt et al., 2004). Whilst forestry is often not a key priority of the extreme poor, LFP develops the natural capital base through improved management of resources, reducing the time for gathering fuel wood. Social cohesion, focusing particularly on minority and previously excluded groups, was enhanced through workshops, training and exposure visits. The community forestry programme also enhanced the financial

assets through the sale of the increasingly available non-timber forest products (Pokharel, 2001).

(ii) Plan Nepal's livelihood focus is to improve children's welfare through increased family income and food security. The aim of the programme is to boost family incomes through improved farming productivity, leading to higher income and food security, which affects child nutrition. Increased incomes also increase the possibility for greater schooling of children (Plan International, 2004; Plan Nepal, 2004).

(iii) CARE's livelihood project is being implemented over five years in the far-western district of Achham (CARE International, 2004a). The aims of the project include:

- to improve the health of young women and children;
- improve nutrition and sanitation;
- improve the use and effectiveness of government and private health services;
- increase sources of income;
- improve the socio-economic status of women and the status of lower-caste groups;
- diversify farm production; and
- explore opportunities for economic development in the district.

(iv) The United Nations Develop Programme (UNDP Nepal) has SL amongst its five targets areas (UN Nepal Platform, 2005a), with livelihoods programmes in 31 districts, which aim to improve rural access and incomes (UN Nepal Platform, 2005b).

Additional livelihoods programmes which may provide opportunities for SL-type interventions, were, however, being implemented by various other agencies including the Canadian International Development Agency (CIDA), the Danish International Development Agency (DANIDA), GTZ (German donor), the Royal Norwegian Embassy (RNE), the Swiss Development Cooperation (SDC), the Asian Development

Bank (ADB), the Lutheran World Federation (LWF), Ockenden, Save the Children USA and World Vision (UN Nepal Platform, 2005b).

3.2.1.3.Engineering for community development in Nepal

The sectoral approach of HMGN provides guidelines for infrastructure community development activities in Nepal with focuses on issues such as Science and Technology, Irrigation, Electricity, Drinking Water and Sanitation, Road Transportation and Labour and Transport Management. Table 13 illustrates the planned growth in infrastructure services between the current situation and the end of the next final planning period, showing a particularly strong focus in the Tenth Plan of Village Development Committees (VDC) communications (186% growth) and electrification (63% growth).

Table 13: Major targets for physical infrastructure

	Ninth Plan (2002/03)	**Tenth Plan (final year)**	**Twelfth Plan (2016/17)**
Districts with road network	60	70	75
Area under irrigation (per '000 hectares)	1,121.4	1417	1,686
Telephone distribution (per '000 population)	14	40	150
VDCs with telephone service	1,761	3,951	
VDCs with computer network		1,500	
Population with electricity (%)	40	55	80
VDCs with electricity	1,600	2,600	
Agricultural and rural roads (km)		10,000	
Population with safe drinking water (%)	71.6	85	
Additional population with sanitation ('000 of people)	5,910*	7,421	

*Data provided is for 2001/2002

(adapted from NPC, 2002)

The implementation of these targets is the aim of a diverse group of programmes covering tasks from the construction, maintenance and rehabilitation of earthen and rural roads, river and landslide control, drainage, suspension bridges, small-scale

irrigation, drinking water and sanitation, rural micro-hydroelectricity and appropriate technical and hygiene skills training. Some of these programmes are listed below (ITDG Nepal and ITC, 2002; NPC, 2002):

- Rural water supply and sanitation fund development board (RWSSFDB);
- Rural Community Infrastructure Work (RCIW);
- Rural Infrastructure Development Program (RIDP);
- Agricultural Road (AR) Program;
- Rural Energy Development Program (REDP);
- Local Trail Suspension Bridge Program;
- Poverty Alleviation Project (PAP); and
- Remote and Special Area Development Program.

CHAPTER 4. Methodology

The research was divided into three action research phases and an analysis phase, as listed below:

(i) Field establishment: establishing the field location including an In-Country Orientation Programme, conducted by the in-country manager, CECI.

(ii) Case-study orientation: developing rapport with the case-study organisation, collecting background data regarding the organisation and its activities and undertaking a scoping study to identify research participants.

(iv) Data collection: workshops, overt observation, informal discussions, surveys and questionnaires for both the case-study organisation and external stakeholders.

(v) Analysis: detailed systemic analysis of systems for best practice for SL.

Appropriate human ethics safeguards were implemented throughout the research as detailed in section 4.6. Table 14 illustrates the logframe[8] for the action research and Figure 8 shows the proposed time schedule for research.

4.1.Field establishment

The initial phase of research was undertaken to establish the field location in Nepal. This included establishing the researcher's accommodation in Kathmandu and making initial contact with the organisation for the case study. An extensive orientation programme was conducted by the in-country manager, including a briefing regarding the country's political, spiritual and development context, language and city orientation. Additionally, an introduction was provided on Nepali culture including traditional food and dress. The importance of this phase in the successful completion of the project was to ensure awareness in the vastly different cultural and spiritual environment of Nepal.

[8] The logical framework approach (LFA) is a project planning tool identifying the goals, activities, performance questions, indicators and assumptions for the action research (IFAD, 2002). A logical framework matrix (or logframe) was used in this research to ensure a focus on outcomes rather than outputs; to track assumptions that are outside the direct control of the project and are critical for the success of the project; and to guide monitoring and evaluation.

This enhanced effective communication with participants and reduced risks associated with cultural practices at all stages of the research.

4.1.1. Field location

The researcher worked as a Project Engineer with Integrated Development Society (IDS)-Nepal, based in Kathmandu from October 2003 to October 2004. The research was conducted entirely within the Kathmandu Valley, largely at the organisation's office in Baluwatar, Kathmandu, with occasional project visits to Bishankanarayan and Godavri, Lalitpur. The field location is shown in the map in Figure 9.

Table 14: Logframe for the action research

Goal	**Performance questions and indicators**	**Monitoring mechanisms**	**Assumptions**
Improve practice of SL by traditional engineering non-government organisation	Performance questions: * Is SL relevant in the infrastructure community development sector? * Are donors/policy-makers moving towards SL? * How has SL changed practice in grassroots engineering NGOs? Target indicators: * Implementation of 1 project based on SL * Development of 1 partnership for SL based * Delivery of 1 training for additional internal and external staff * Conference/journal paper about the practice of SL by grassroots engineering organisations	* Review of opportunities for SL in advertised infrastructure programmes * Review of changes affected for SL practice	* Systemic analyses of practice and subsequent appropriate training will improve SL * SL will positively affect the activities of engineering NGOs
Purpose	**Performance questions and indicators**	**Monitoring mechanisms**	**Assumptions**
IDS-Nepal affects change in practice for SL	Performance questions: * Is change occuring throughout IDS-Nepal? * Is change improving IDS-Nepal's ability to work with SL more? Target indicators: * 2 barriers removed for SL practice * 2 opportunities developed for SL practice * Increase in number of activities using SL	* Review of IDS-Nepal activities * Interviews with key	* IDS-Nepal has the resources for change

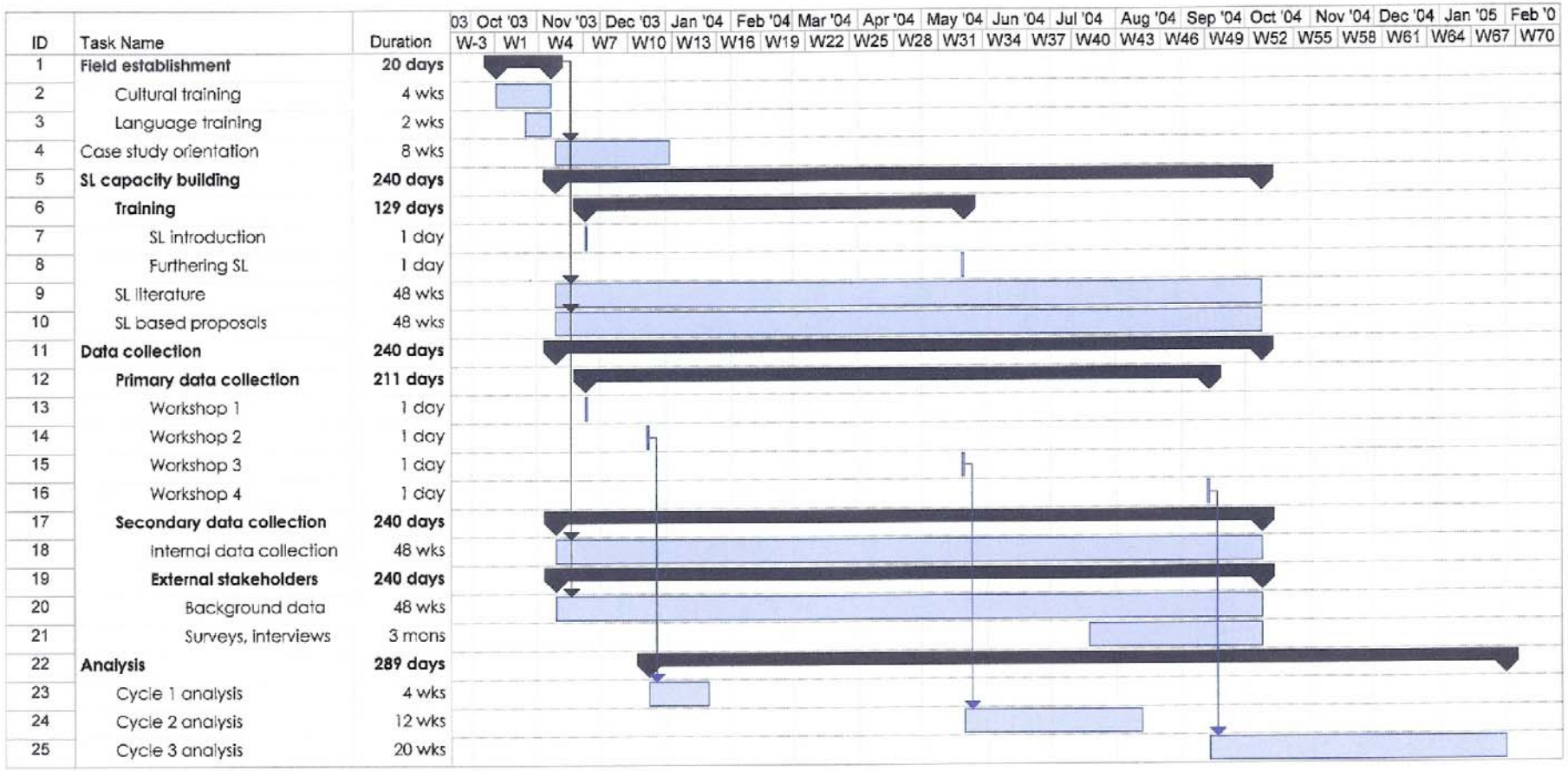
Outputs and activities	**Performance questions and indicators**	**Monitoring mechanisms & information sources**	**Assumptions**
1) IDS-Nepal adopts SL in their engineering activities	Performance questions: * In what activities is SL being adopted? * How is the adoption of SL affecting existing IDS-Nepal activities? * Who is adopting SL? * What is the reason for adopting SL? Target indicators: * IDS-Nepal submits three proposals based on SL * IDS-Nepal reviews three jobs based on SL * IDS-Nepal reviews their work opportunities and threats based on a SL analysis * 2 key staff members of IDS-Nepal are trained in practice and theory of SL	* Systemic analysis of IDS-Nepal practice for key SL concepts * Review of staff scheduling * Interviews of key * Analysis of SL activities	* Existing staff are used for SL activities
Activities for output 1	**Key inputs**	**Assumptions**	
1-1: IDS-Nepal reviews practice for SL core 1-2: IDS-Nepal develops theoretical knowledge of SL approach 1-3: IDS-Nepal develops practical skills for SL	* Researcher * Training materials * Key IDS-Nepal SL participants	* Initial training will be delivered to a wider range of IDS-Nepal * Opportunities exist for practical training	

Outputs and activities	**Performance questions and indicators**	**Monitoring mechanisms & information sources**	**Assumptions**
2) IDS-Nepal identifies conflicting activities for SL practice	Performance questions: * What barriers exist to IDS-Nepal for SL practice? * Are these barriers short-term? * How can these barriers be removed? * Will removing these barriers cost IDS-Nepal resources, time, money? Target indicators: * IDS-Nepal identifies 2 external political barriers to SL practice * IDS-Nepal identifies 2 external social barriers barriers to SL practice * IDS-Nepal identifies 2 internal barriers to SL	* Systemic analysis of infrastructure activities * Assessment of external commitment to SL * Assessment of level of awareness and commitment	* Identification of barriers to SL practice will initiate their removal/ avoidance * SL practice is a priority for IDS-Nepal
Activities for output 2	**Key inputs**	**Assumptions**	
2-1: IDS-Nepal identifies restricting donor practice 2-2: IDS-Nepal identifies their own practice contrary to SL type 2-3: IDS-Nepal identifies external limitations to SL	* Facilitator * Key IDS-Nepal SL participants	* IDS-Nepal's close dependence on donors will affect practice	

Outputs and activities	**Performance questions and indicators**	**Monitoring mechanisms & information sources**	**Assumptions**
3) IDS-Nepal identifies opportunities for SL practice	Performance questions: * What opportunities exist for SL practice in existing practice? * Are these opportunities feasible financially and institutionally? Target indicators: * IDS-Nepal develops 1 concept paper based on SL * IDS-Nepal identifies 2 potential partners for SL * IDS-Nepal commits 2 staff to developing SL	* IDS-Nepal workplans * IDS-Nepal strategic planning documents * IDS-Nepal documents, including project reports and proposals	* Identification of opportunities is the first step to their development * SL practice is a priority for IDS-Nepal * Opportunities need to be both culturally appropriate and institutionally feasible for their success
Activities for output 3	**Key inputs**	**Assumptions**	
3-1: IDS-Nepal identifies internal human resources and general resources for expanding SL capacity	* Facilitator * Management committee	* Commitment from the Management Committee is necessary to engage key SL participants	
3-2: IDS-Nepal defines its existing role as a grassroots engineering 3-3: Through systemic analysis of existing practice, IDS-Nepal identifies SL-appropriate	* Facilitator * Key IDS-Nepal SL participants * IDS-Nepal documents including project reports, proposals and strategic planning documents	* Identifying existing practice helps to prioritise SL and define its * Not all activities are appropriate for SL * Community development practice is dependent on financial support	

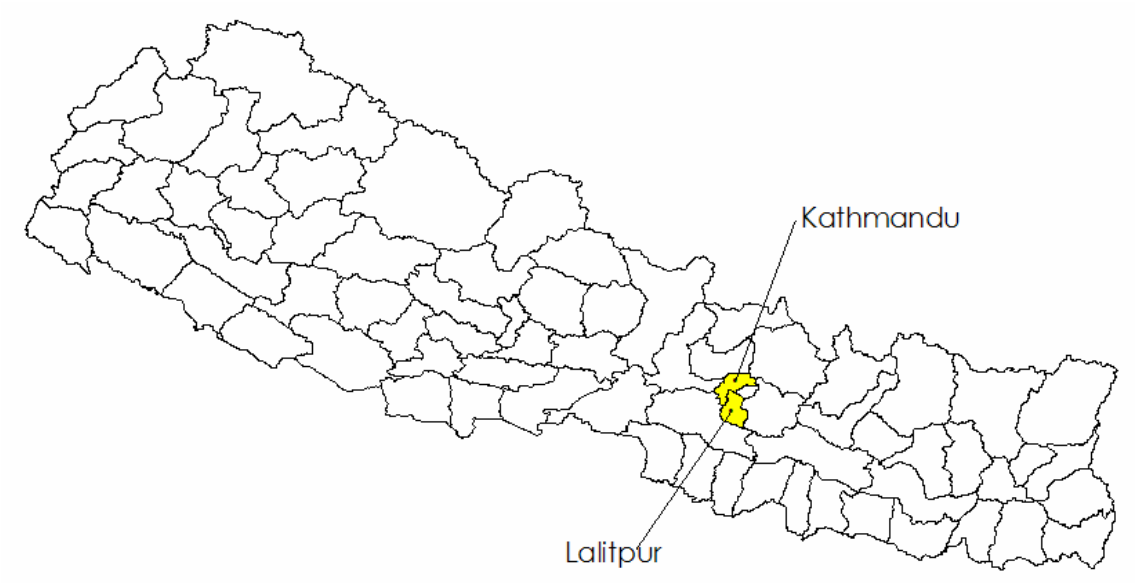
Outputs and activities	**Performance questions and indicators**	**Monitoring mechanisms & information sources**	**Assumptions**
4) IDS-Nepal identifies the role of SL in external stakeholders	Performance questions: * Is SL being adopted across all levels of infrastructure external stakeholders? * What are the training needs of external * Do the SL needs and opportunities of external stakeholders reflect those of IDS-Nepal? * To what extent is SL understood and implemented in infrastructure community development activities? Target indicators: * Review of community development activities and SL in 10 community level infrastructure organisations * Review of community development activities and SL in 2 meso level infrastructure organisations * Review of community development activities and SL in 2 policy level infrastructure organisations	* Surveys of external stakeholders * Review of external stakeholders programmes	The role and practice of external stakeholders impacts upon IDS-Nepal's ability to practice SL
Activities for output 4	**Key inputs**	**Assumptions**	
4-1: Review practice of external stakeholders in SL	* Background literature * Facilitator		
4-2: Survey community level infrastructure 4-3: Survey meso level infrastructure 4-4: Survey and interview policy level infrastructure organisations	* Facilitator * Survey materials	* Some understanding of SL exists * Participants are willing to share organisational knowledge	

Figure 8: Research schedule



ID	Task Name	Duration
1	**Field establishment**	**20 days**
2	Cultural training	4 wks
3	Language training	2 wks
4	Case study orientation	8 wks
5	**SL capacity building**	**240 days**
6	**Training**	**129 days**
7	SL introduction	1 day
8	Furthering SL	1 day
9	SL literature	48 wks
10	SL based proposals	48 wks
11	**Data collection**	**240 days**
12	**Primary data collection**	**211 days**
13	Workshop 1	1 day
14	Workshop 2	1 day
15	Workshop 3	1 day
16	Workshop 4	1 day
17	**Secondary data collection**	**240 days**
18	Internal data collection	48 wks
19	**External stakeholders**	**240 days**
20	Background data	48 wks
21	Surveys, interviews	3 mons
22	**Analysis**	**289 days**
23	Cycle 1 analysis	4 wks
24	Cycle 2 analysis	12 wks
25	Cycle 3 analysis	20 wks

Figure 9: Location of field research



4.2.Case study orientation

The second phase of the research was conducted to develop a rapport with IDS-Nepal, in order to gain trust to work productively and effectively. Orientation with their activities, objectives, working modalities, capabilities and personnel was conducted. Background data was collected to help define the organisation in the context of development in Nepal and their transition towards the SL approach.

A scoping study was carried out to identify appropriate participants for the final phase of research. This was conducted through the researcher's interactions with the staff of IDS-Nepal, in conjunction with resourcing requirements from the Chairman of the organisation.

4.3.Data collection

In this phase of the research data was collected regarding the practice of engineering and the opportunities and limitations for the transition to the SL approach. Additional data regarding external stakeholders associated with IDS-Nepal's engineering activities was collected to help define the community development context. Finally, secondary data was collected to support the analyses of IDS-Nepal and the primary data from external stakeholders.

4.3.1. Primary data collection

The data collected through workshops and focus groups, overt observation and secondary data collection was used to synthesise models of the systems and identify the

confines and potential for SL practice. Formal workshops and focus groups were held as summarised in Table 15.

Table 15: Data collection workshops

Workshop	Date	Attendees	Purpose
1	24/11/03	Chairman, programme manager, project manager, junior environmental scientist, administration manager, technical manager, 2 junior engineers	Introductory SL training
2	23/12/03	Programme manager, junior environmental scientist, human resources manager	Define IDS-Nepal, based on SL framework
3	20/05/04	Programme manager, junior environmental scientist	Review of IDS-Nepal SL practice
4	13/09/04	Programme manager, junior environmental scientist	Review systems from Workshop 3 and cycle 2 analysis

4.3.1.1.Workshop 1

The initial workshop explored existing knowledge and practice of SL in the NGO, introduced the key aspects of SL and initiated the process for analysis of the systems for developing practice for SL, as summarised in Table 16.

Table 16: Workshop 1 programme

Workshop Stage	Content	Approach
Stage 1: IDS-Nepal	IDS-Nepal's commitment to SL	Group work facilitated by researcher
	IDS-Nepal's current project approach	
Stage 2: SL	Multidimensionality of poverty	Presentation by researcher
	Sustainable Livelihoods	
	Core concepts	
	Framework	
Stage 3: Back to IDS-Nepal	Institutional dimensions for practice	Group work facilitated by researcher
	Where to from here?	

4.3.1.2.Workshop 2

The second workshop defined IDS-Nepal, their practice and limitations, using the SL framework to guide the investigation. This structure for the workshop was used to develop theoretical and practical skills for the use of the framework. Data was collected to define the following aspects of IDS-Nepal:

- staff numbers and nature;
- organisational goals and strategies;
- activities;
- assets, including human, financial, physical and social;
- policies affecting the activities of IDS-Nepal;
- formal and informal institutions; and
- external influences and limitations.

The data collected from this workshop was used as the basis for the first cycle of analysis. Additionally, the role of SL within the organisation to date was identified.

4.3.1.3.Workshop 3

The aim of the third workshop was to review IDS-Nepal's practice centred on the key concepts of SL. The activities of the systems and key players were identified for the following core concepts:

- holistic;
- people-centred;
- dynamic;
- sustainable;
- macro-micro links; and
- building on strengths.

Initial systems diagrams were built and further developed in the analysis phase of the research. This was used as the key data for the second cycle of analysis.

4.3.1.4.Workshop 4

The final workshop reviewed the systems from Workshop 3 and, based on the outputs of Workshop 3 and the second cycle analysis, developed the tasks and key players for additional systems.

This data was used as the key inputs for the third cycle of analysis.

4.3.2. Secondary data collection

Secondary data was gathered in order to verify that collected through the above workshops and to define the political, social and development context within and surrounding IDS-Nepal. Additionally, data was collected to provide a background to identify appropriate external stakeholders. This data was used in the analyses as defined in section 4.4.

Data was collected through the following methods:

(i) overt observation/participation in workplace activities;

(ii) attendance at external workshops/meetings;

(iii) review of IDS-Nepal's documents including project reports, proposals, concept papers, strategic planning documents;

(iv) informal discussions with IDS-Nepal staff, including contractors;

(v) internet searches regarding development in Nepal; and

(vi) newspaper searches regarding political and social context of Nepal.

4.3.3. External stakeholders

The use of external stakeholders in the research enhanced the definition of the political, social and developmental context surrounding IDS-Nepal's activities. It also served to verify or confront the information collected within the organisation, and served as examples from the engineering field. Further, data was used to identify a need and/or direction for change in the approach to engineering service provision.

Stakeholders were selected based on their direct association with IDS-Nepal's engineering activities and their availability and willingness to participate. From an SL perspective, there were three levels of stakeholders: macro, meso and micro. In the context of IDS-Nepal it was assumed that macro was the policy-making level; meso was

the international and national NGO level and micro was the community level. At the policy-making level in Nepal, donors contributed directly to this process and therefore were considered jointly on the macro level.

4.3.3.1.Surveys

Surveys were developed to investigate the level of awareness of SL and its effectiveness. For this purpose, they explored the following issues:

- sector involvement and district location;
- partner details;
- background and numbers of staff;
- duration, size and beneficiaries of projects;
- working methodologies, including tendering and design;
- environmental and financial sustainability;
- government interactions;
- monitoring and evaluation;
- community participation and partner involvement;
- working approaches; and
- learning styles.

These were developed and piloted in conjunction with senior IDS-Nepal staff. A copy of the instrument is attached in Annex A. Surveys were conducted with the following stakeholders:

- policy-makers;
- donors;
- international non-government organisations (I/NGOs); and
- community team leaders;
- community technicians/workers;
- software (that is, human resources) supervisors.

For lower-level stakeholders (community technicians/workers, team leaders and human resources managers) surveys focused on daily practice, whilst for higher-level stakeholders (policy-makers, INGOs and donors) additional questions were asked

regarding policy-making and partnerships. The differentiation between groups was piloted on IDS-Nepal.

The surveys for the lower-level stakeholders were conducted during two weekend training sessions for rural water supply and sanitation, conducted by IDS-Nepal's partner, ETA Consult. The first session provided additional feedback on the survey format, and changes were made for the second session. Due to the time restrictions of the training, only 21 surveys were conducted. For the higher-level stakeholders, three surveys were conducted in conjunction with semi-structured interviews. Whilst these sample sizes were statistically insufficient, the data collated served to give an overall view of SL amongst external stakeholders and verified data collected throughout the more extensive data collection phase with IDS-Nepal. This data was not intended to form the basis of conclusive results. Summaries of these results are provided in Annex B.

4.4.Analysis

Three cycles of analysis were conducted of IDS-Nepal, as summarised in Table 17. These analyses were guided by Checkland and Scholes' (1999) soft systems methodology, as introduced in section 2.7. This participatory methodology was used to incite participation from within IDS-Nepal to ensure that opportunities and limitations to practice were identified from within the organisation.

Table 17: Cycles of analysis conducted

	Cycle 1	**Cycle 2**	**Cycle 3**
Purpose	Rapid assessment of IDS-Nepal's primary tasks	Analysis of key systems to implement core SL concepts	Follow-up analysis of those systems for best practice for SL
Duration	1 month	2–3 months	4–5 months
Key methodologies	Brainstorming, workshops, focus groups, overt observation, surveys, semi-structured interviews, problem trees, flow diagrams		

Three stages helped to define the process of each cycle of systemic analysis. These stages ran concurrently, interacted and provided feedback to each stage. They did not necessarily proceed in a linear fashion.

4.4.1. Defining the problem situation

The first stage was to define the problem. Systemic analyses acknowledge the impact of the social, cultural, institutional, historical and political environment surrounding the real world problem and its "would-be-improvers". Two streams of enquiry were structured around the problem situation. The first analysis explored the relationships, tasks and issues associated with the problem situation. This stream of enquiry began the logic-based analysis. The second stream of analysis explored the culture around the problem situation.

4.4.1.1.Stream of logic-based analysis

Logic-based analyses were used to identify and define the problem situation for IDS-Nepal. The problem situation was characterised through root definitions formulated on the mnemonic "CATWOE", to ensure that well-rounded root definitions were formed. This is represented as below:

C: Customers – the beneficiaries or victims of T

A: Actors – those who would do T

T: Transformation process – the conversion of input to output

W: Weltanschauung – the worldview that makes this T meaningful in context

O: Owner(s) – those who could stop T

E: Environmental constraints – elements outside the system which it takes as given (Checkland and Scholes, 1999).

The subjectivity on what was meaningful in the world was the result of the individual's experiences, knowledge, preferences and history. Each person's worldview affected how he or she interpreted the problem situation. The concept of *Weltanschauung* (W) specifically identified the individual reasons for carrying out each activity modelled, covering this worldview.

These analyses helped to explore the system, as perceived by IDS-Nepal, based in the real context. The root definition formulated the purpose of the system.

Workshops, informal discussions and observation were used to develop an holistic picture of the existing situation and thus formulate these analyses.

4.4.1.2.Culture-based stream of analysis

The cultural stream of analysis involved three parts: intervention, social and political analyses. Table 18 summarises the data that was analysed through this stream.

Table 18: Data required from stream of cultural analysis

Intervention Analysis	Social Analysis	Political Analysis
▪ client ▪ would-be problem solver ▪ problem owner	▪ norms ▪ roles ▪ values	▪ disposition of power ▪ process by which power is used, obtained, protected, preserved, passed on, relinquished ▪ nature of power

(adapted from Checkland and Scholes, 1999)

4.4.2. Model-building

The second stage built models to represent the ideal human activity systems for each problem situation. A conceptual model, or flow diagram of tasks and links of the system realises the definition of the ideal situation of the system.

The model-building stage was progressive, as relevant systems at the particular stage of analysis were identified and explored. This provided insight into other more relevant systems. The conceptual models were altered to reflect additional information as it was gathered regarding these systems.

4.4.3. Comparison with the real world

The comparison of the conceptual models with the reality of practice verified the accuracy of their representation with the problem situation and helped to identify areas of restrictions and potential for SL practice.

The key points of comparison for both the activities and links in the models included:

- their manifestations;
- methodology of implementation;
- methodology of judgment; and
- additional comments on opportunities or limitations, etc.

4.5.SL capacity-building

An ongoing focus throughout the data collection phase was building the capacity of IDS-Nepal regarding the concepts and applications of SL. This was carried out through the following:

- two training sessions conducted by the researcher for head office staff;
- ongoing provision and orientation with learning materials, including written articles, case studies and guidelines and electronic data including websites and guides;
- informal discussions;
- discussions with those external stakeholders with SL expertise; and
- development of concept papers and proposals with an SL focus.

4.6.Ethics considerations

A submission and a subsequent amendment was made and accepted by the UTS Human Research Ethics Committee. For ethical considerations, it is important to note that the research was generated from within IDS-Nepal, and that the goals of the research were formulated in conjunction with it. A summary of the issues related to risk and ethics is provided in the subsequent sections. For complete details and all supporting documents to the submission, refer to Annex C.

4.6.1. Participants' involvement

Participation was through the participants' usual roles with IDS-Nepal, therefore no additional time or travel was required of them.

4.6.2. Risk/harm

Risk may have involved power or gender imbalances, leading to coercion to participate, inappropriate data collection methods or inaccurate data. Risk was minimised through an extensive rapport-building and cultural-orientation phase during the initial phase of the research. The role of the researcher was as a facilitator only, and did not affect the nature or delivery of changes in any way. Further, ongoing observation verified data. Should power/gender issues have arisen, anonymous surveys were to be conducted. Due to the nature of the workplace and its regular exposure to a diverse range of cultures through previous volunteers, this was not necessary.

A memorandum of understanding (MoU) between IDS-Nepal and UTS clarified confidentiality issues with regard to publications, staff interviews, workshops and access to IDS-Nepal's records. Additionally, the MoU addressed the researcher's relationship with external stakeholders.

4.6.3. Consent and confidentiality

Consent forms were signed by both the Chairman of IDS-Nepal and external participants. Participants' names or roles were not published in reports/publications if confidentiality was requested. If confidentiality was requested, a consent form was not to be signed, rather an information sheet detailing risks and contact details was to be provided. This, however, was not required.

As the action research was partly a capacity-building exercise for IDS-Nepal, the organisation's name was published in all research/development articles (as per the MoU).

4.6.4. Benefits/payments

Findings were shared with participants, which was part of the capacity-building process. Additionally, participants were given the opportunity to co-author journal articles, which was also to help with capacity-building. Workshops that were additional to participants' usual roles incorporated refreshments supplied by the researcher.

4.6.5. Language and cultural considerations

Whilst the study was undertaken in Nepal, specific participants were not delineated by language or culture. Involvement was defined rather by their role in the community development sector.

As English was the working language of IDS-Nepal, all full-time staff were fluent in written and spoken English. In the event of part-time staff or external participants whose English was insufficient, professional translators/interpreters were available and their services were to be used when required. Confidentiality agreements were to be signed by any translators/interpreters used. The information sheet was to be translated into Nepali. The use of interpreters was not required during the research.

Details of the in-country manager were given to provide a local, independent contact for participants.

4.6.6. Access to data

Personal surveys, interviews and the results of participant observations were kept confidential and access was granted only to those individual subjects. Records of focus-group discussions were only accessible by those involved in the focus group.

4.6.7. Other ethical issues

Other ethical issues included possible exposure behaviour or practices outside normally acceptable practices, which may have been deemed as corrupt by local standards. Advice was to be sought from the in-country manager before taking action with regard to what was culturally appropriate behaviour from Nepali nationals, and with regards to culturally appropriate means to approach these practices. This was, however, not required during the research.

CHAPTER 5. RESULTS AND ANALYSIS

The results of a scoping study to identify participants from IDS-Nepal are summarised in section 5.1. Three cycles of data collection and analysis were then used to explore the challenges and limitations to practice for grassroots engineering non-government organisations through a case study. These cycles were:

(i) Cycle 1: a rapid assessment of IDS-Nepal's primary tasks;

(ii) Cycle 2: an investigation of the key systems for SL; and

(iii) Cycle 3: follow-up analysis of those systems for best practice for SL.

Each of these cycles was initiated by a finding-out phase, through workshops, informal discussions and observation as described in Chapter 4. The results from each cycle of this phase is summarised in sections 5.2, 5.4 and 5.6.

Based on this data key problem situations for best practice for SL were identified for detailed systemic analyses. Seven systems were progressively identified and prioritised by IDS-Nepal and modelled. Each cycle built on the results of preceding systems analyses for problem identification. The idealised systems were then compared to the reality of engineering practice for the case study NGO. This stage highlighted the discrepancies between actual practice and the ideal. These analyses for the case study are summarised in sections 5.3, 5.5 and 5.7. Results were not restated where they replicated those from previous systems. These results are based on the opportunities and challenges to engineering practice that were culturally feasible and appropriate for the NGO in the existing political, social and organisational context at the time of the research.

Two projects from the NGO are then described in section 5.8 to illustrate the real practice from which these systems were developed, defined and analysed.

Finally, the data collected from external stakeholders is summarised in section 5.9.

5.1.Scoping study

The scoping study identified the Programme Manager and a junior environmental scientist as key participants for the research. This was based on their previous involvement with SL, their availability as determined by the Management Committee, and their willingness to learn as discussed with the Management Committee. Additional participants included the Chairman, Project Manager and Human Resources Manager

when available. All staff were involved to a smaller degree in capacity-building exercises and participated in discussions and semi-structured interviews.

External participants were selected from those stakeholders directly associated with the activities of IDS-Nepal, based on their availability and willingness to participate. These participants were used only in the data-collection phase and not in the subsequent analysis phase. The exclusion of these external participants from this phase limited the ability of IDS-Nepal and the research to affect change within these organisations.

5.2. Cycle 1 key findings

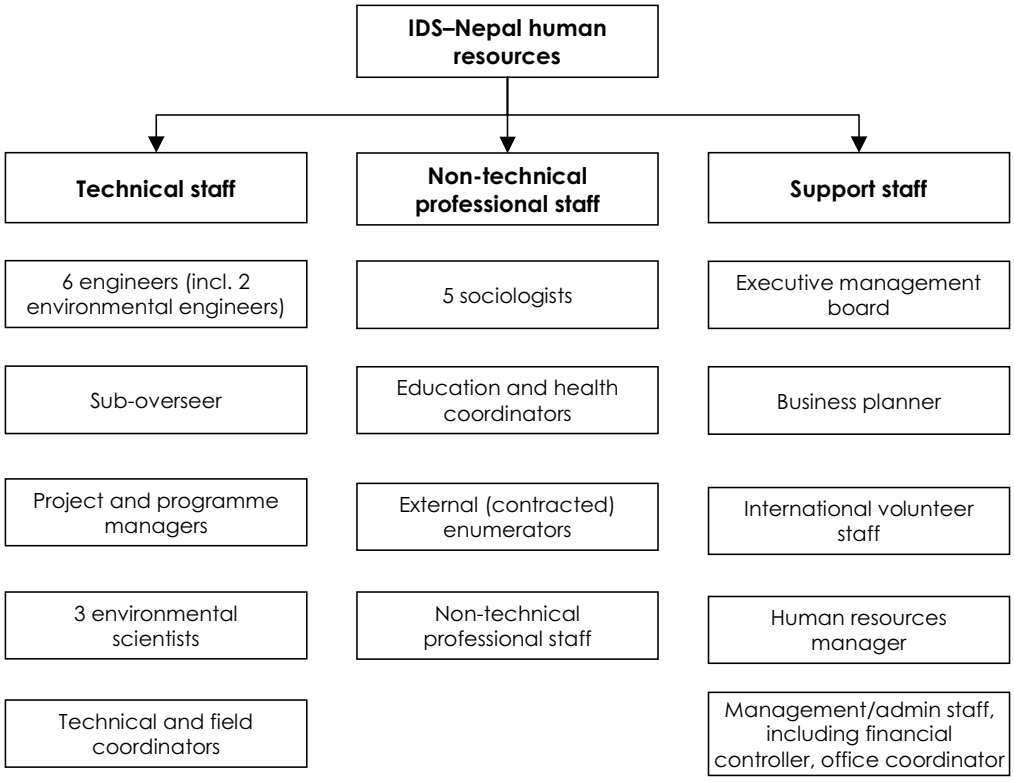
The first cycle of data collection for analysis was conducted in Workshop 2 on 23 December 2003, attended by the Programme Manager, a junior environmental scientist and the human resources manager. This helped to define IDS-Nepal, its primary activities and the community development context that mutually affected IDS-Nepal's activities. The following sections summarise the data collected in this cycle, as defined by IDS-Nepal.

5.2.1. IDS-Nepal

IDS-Nepal was established in the year 2000, and is based in Kathmandu, Nepal. It is a non-government organisation (NGO), staffed by Nepali nationals. Figure 10 summarises the staff of IDS-Nepal, illustrating the technical focus of the NGO.[9]

[9] Due to a high level of unemployment in Nepal, it was not difficult to find available professional and technical staff.

Figure 10: IDS-Nepal staff

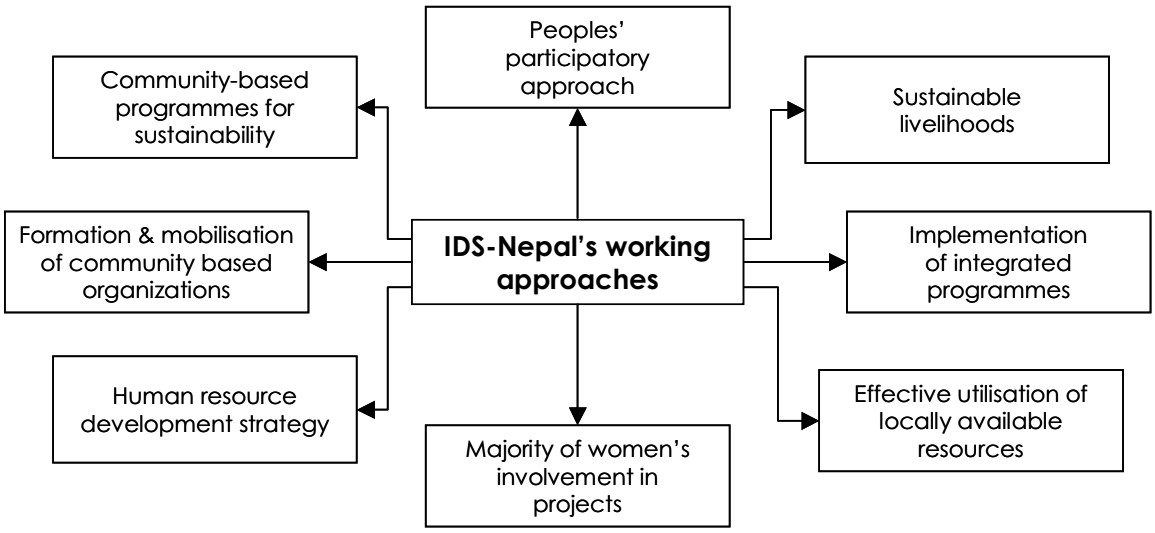


The strategic plan identified the mission of IDS-Nepal as assisting sustainable and equitable development of community infrastructure and improvement of livelihoods (IDS-Nepal, 2003b). The objectives of the organisation were to:

- *promote sustainable and equitable community based development activities;*
- *implement integrated, environmentally friendly, development activities using a participatory approach;*
- *practice sustainable use of indigenous knowledge;*
- *develop and implement different types of sustainable training modules, which ensure employment;*
- *conduct seminars, workshops, researches* (sic) *and advocacy on the above; and*
- *work towards capacity building of the local government institutions and CBOs and the development of local human resources* (IDS-Nepal, 2003b).

More immediate IDS-Nepal outcomes included quality work, building donor relationships and long-term financial sustainability. Figure 11 summarises the approaches used by IDS-Nepal in order to achieve these objectives.

Figure 11: Working approaches of IDS-Nepal



IDS-Nepal had both engineering and social science focuses, complementing each other in most projects. Its major engineering focuses were water quality and supply, sanitation, alternative energy (including solar power, micro-hydro and biogas) and skills training, with minor focuses on the environment, micro-irrigation, waste management and rural reconstruction.

A large part-time base that was utilised for larger projects or to meet tight deadlines supplemented the full-time staff. The availability of this part-time staff allowed for greater flexibility in designating staff for different projects.

The level of English proficiency amongst the staff was high. The ability of IDS-Nepal to submit technical proposals in English rather than in Nepali was higher. Outside staff were used to assist when proposals had to be submitted in Nepali, limiting the number of proposals that were submitted in Nepali.

Two formalised forums operated in IDS-Nepal. At the highest level, the IDS-Nepal Executive Board consisted of seven volunteers who decided the form of the constitution, policies and major financial decisions. The Management Committee consisted of the Chairman, Programme and Project Managers, Technical Coordinator and Human Resource Manager. Both genders were equally represented on the Committee. The Management Committee met intermittently to discuss financial matters, resourcing and programme development. Within this Committee, power was equally attributed and respected, although the Chairman was the most assertive and thus had the greater final share of power. Aside from the Management Committee power

again was equally attributed to all staff. Decision-making and the formulation of new ideas were shared. However, again, the Chairman had the greater share of power. Communication lines were open and friendly, however, the lines of reporting could be unclear. Table 19 identifies some of the activities and projects of IDS-Nepal since 2001.

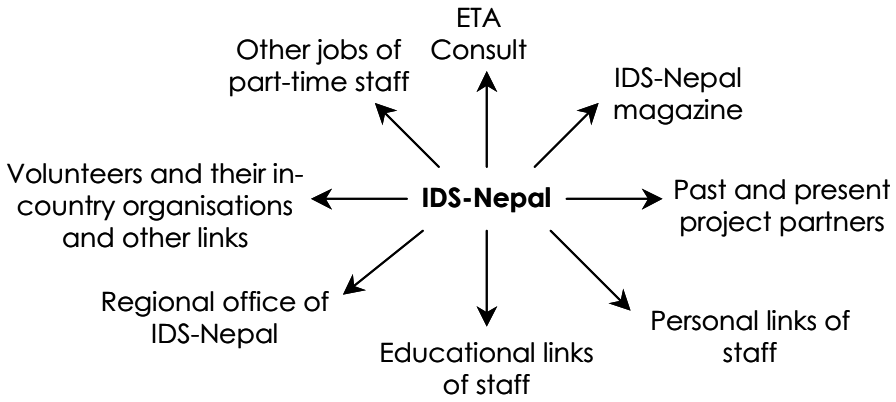
Table 19: A sample of IDS-Nepal's projects and activities

Project	Activities
Sustainable water and sanitation	Construction of domestic latrines, school and public toilets, tubewells and waste disposal pits Community training for water quality, health and sanitation Technical training for Water and Sanitation Users Committee Distribution of waste barrows
Socio-economic baseline study	Questionnaire survey on socio-economic status in 12 VDCs
Workshop on arsenic in drinking water	Arsenic testing and remediation training Arsenic testing
Hospital waste management	Installation of incinerators
Resource Center Development	National Water and Sanitation Resource Center Development
Barefoot Technician Training	Basic electrification on-the-job training
Sustainable Environment Programme	Alternative energy research Installation of solar cells Construction of rain water collection jar Operation and maintenance training for peltric set, solar cells and water networks
Community-based sustainable livelihood by production of fire briquettes	Training for fire briquettes Supply of fire briquette equipment Establishment of micro-enterprise
Fire disaster support program for victim families	Reconstruction of village facilities including homes, water network, and toilets

Project	Activities
Baseline Survey of Junior Red Cross International Friendship Project	Baseline survey

The diversity of networks and social links of IDS-Nepal reflected the diversity of staff in the organisation. These are illustrated in Figure 12. Communication with some of these networks, however, was sometimes limited, particularly with the regional office.

Figure 12: Networks and social links of IDS-Nepal



IDS-Nepal had a strong relationship with Engineers' and Trainers' Associates (ETA Consult), a private company of engineers and trainers. ETA Consult was the parent organisation of the two, which split into the individual organisations in 2000. After the formation of IDS-Nepal as an independent organisation, the engineers, programme and project managers who worked with IDS-Nepal were employed by ETA Consult and volunteered their time to IDS-Nepal. This was a complementary relationship whereby IDS-Nepal fulfilled the requirements for some jobs and ETA Consult for other jobs and ETA Consult provided some financial stability for IDS-Nepal.

An IDS-Nepal magazine aimed to reinforce the above networks through sharing project information and raising awareness of industry issues. It was the intent to be distributed to all offices and some external clients/partners, however, the first publication had not yet been issued during the duration of the field research.

The IDS-Nepal head office had standard office assets including computers, telephones, printers, internet, fax, kitchen facilities and a car and motorcycles. During peak work

periods limited items such as computers and motorbikes were insufficient to cover the needs of all staff. However, distribution of resources was enhanced by the flexible working hours promoted by the organisation. The head office had access to a water network and power.

The financial stability of IDS-Nepal was limited.[10] When the workload was low, part-time staff had to be reduced. IDS-Nepal's existence was project-driven and therefore donor-dependent. Their workload consisted of short-term projects, averaging a project duration of less than one year.[11]

5.2.1.1.Context – policies

The activities of IDS-Nepal were affected by the policies of HMGN and its ministries, including such bodies as Ministry of Physical Planning and Works (MPPW) of HMGN, Ministry of Population and Environment (MOPE), District Water Supply Office and Nepal Water Supply Corporation. Each of these bodies had its own set of regulations to direct activities within Nepal. However, frequent changes of government ministries and low policy enforcement affected the validity of these policies. This also affected the ability of IDS-Nepal to affect policy-makers and their policies to increase the sustainability of development efforts.

INGOs worked in the community through national NGOs, as dictated by a recent policy addition to the development sector. The intended primary purpose for the introduction of this policy was to increase the availability of jobs to national NGOs. In some cases, INGOs created their own national NGOs through which they passed most funds and projects, limiting the availability of funds for other national NGOs.

5.2.1.2.Context – institutions

IDS-Nepal conducted its activities through a culture dominated by the formal and informal political and social institutions of the development sector and the rural communities. Formal and informal cultures and norms existed within IDS-Nepal itself.

The two key political institutions that affected the activities of IDS-Nepal are described:

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[10] In many projects NGOs were not able to claim overhead costs.

[11] One of the objectives of the NGO was to ensure financial stability through multiple projects of long-term duration.

- The local government had its own development agendas in rural communities.[12] Local government was more likely to permit community development agencies if their projects support its own development aims.
- Poor working conditions in HMGN for government staff indirectly affected the activities of IDS-Nepal. Inadequate government salaries were insufficient to support workers and their families. Often, workers held additional jobs, including establishing their own NGOs, which had two impacts. Firstly, government offices were frequently understaffed and government processes were slow and often unreliable, limiting the effectiveness of developing macro-micro links. Secondly, nepotism and corruption resulted in many projects being awarded directly to the NGOs of the workers themselves, restricting the field for external agencies.

The social environment of Nepal was dominated by caste and ethnic systems and gender, which strongly influenced the opportunities available to IDS-Nepal and the needs of community groups. IDS-Nepal was most affected by the interaction of caste systems in Nepal. As all IDS-Nepal staff were from the upper castes, they experienced barriers in their interactions with organisations/individuals of other castes in both the professional and the rural community environments. This was due to 'looking after your own' and affected the availability of resources and jobs.

In the rural communities, gender biases were often active, preventing female involvement in development activities. This affected IDS-Nepal's activities, as women were often the larger part of the labour force and had greater awareness of the community's issues.

The community development sector in Nepal consisted of a vast number of both NGOs and INGOs, creating a competitive project environment. Both technical and financial proposals were required in the tendering process and were assessed individually. Officially, the technical competency was of greater importance, however, projects were regularly assessed at the final stage on the financial proposal. INGO informal and

[12] This was defined largely to promote concrete outcomes for the community, contrasting directly with pure research work.

formalised rules, including their methods of awarding projects and defining their working sectors strongly affected the processes and activities of IDS-Nepal.

The culture of the rural community also directly affected the activities of IDS-Nepal. In Nepal, development activities have been conducted since the 1950s. These programmes were often conducted at the research/data-collection phase only, with few tangible outcomes, causing a degree of wariness and scepticism in the communities. Additionally, these programmes often took up valuable time of the community users who were living a subsistence lifestyle. Further, some programmes offered interventions that were not only inappropriate to a community but also cost the community a great deal in time or money. Another issue for the community users was the impact of the political conflict on their willingness and ability to participate in external programmes. The conflict bred fear in rural communities, particularly of unknown people. Thus, to work with the rural poor often required large investments in time to build rapport and trust for effective outcomes.

IDS-Nepal formal and informal customs and norms dominated daily work practices, affecting:

- employment availability and working conditions;
- personal and professional development;
- the nature of power; and
- the competitive nature of the development sector.

Gender, age, religion, ethnicity or caste did not affect employment opportunities for either Nepali nationals or international volunteers within IDS-Nepal. Employment was based only on appropriate education and skills and willingness to work.[13] Women were well represented in the office, in roles as both engineers/scientists and social scientists. Politics and spirituality were not discussed in the office.

The work culture was strong in IDS-Nepal. Nepali staff were required to work six days a week. Volunteers, however, worked Monday to Friday only. When required to meet deadlines, staff worked additional time/days. During political strikes, it was expected

[13] However, all IDS-Nepal professional staff were higher caste Nepalis due to the availability of education in Nepal.

that Nepali staff make every effort to attend the office (although safety was the prime consideration for staff).

IDS-Nepal had a strong culture of professional and personal development. Time for postgraduate study was afforded to many of the staff during standard working hours. Senior management encouraged and often provided emotional support for further education and authoring publications. This developed a high level of loyalty between employers and employees in IDS-Nepal and most staff returned to the organisation on completion of their studies. They supported, particularly junior staff, professional development as well as personal development, such as religious celebrations or family commitments.

The nature of power in IDS-Nepal determined which projects to bid for, which resources to use, individual roles and responsibilities, potential partners, project areas and financial matters.

Another attitude revealed in IDS-Nepal that developed due to the highly competitive nature of development in Nepal was a strong sense of ownership and lack of willingness to share intellectual property and research results.

5.2.1.3.Context – processes

The nature of projects available for IDS-Nepal was twofold:

- HMGN advertised very specific infrastructure, planning or environment projects; participation from IDS-Nepal was often limited to one phase of the project, such as baseline survey or construction of infrastructure. Problem identification was generally carried out as a separate phase of the project. As the scope of these projects was largely defined by HMGN, the bidding process between development agencies was competitive.
- Donors/INGOs advertised grants, for which IDS-Nepal could develop its own project, meeting the donor's pre-defined criteria. Grants provided more opportunities for project innovation than predetermined projects. IDS-Nepal's approach to the programmes centred on the provision of new technology for the community.

Project work was dictated by deadlines, budgets and quality controls established by the donor.

5.2.1.4.Context – seasonalities

Seasonalities most affecting the activities of IDS-Nepal included the subsistence activities of the communities, environmental, spiritual and organisational limitations.

Commitment to subsistence activities in the community, such as the planting and harvesting of crops, limited the availability of the workforce for the implementation of community development projects during the key seasons.

Projects were strongly affected by the weather. Monsoon rains, particularly in the southern terai, raise groundwater levels, which restricted construction activities. To counteract this, projects were staggered where possible in order to complete below-ground construction works before the rains started. Extreme heat also affected construction works, again particularly in the terai. As it was the intent to keep staff constantly employed, it was difficult to schedule projects so that construction works did not happen during this period. Where possible, construction works were carried out early in the morning, or late in the evening. Additionally, work was scheduled so that work further away from Kathmandu Valley (where it was hotter) was carried out in the winter and closer to Kathmandu Valley when it was hot.

Religious festivals also impacted upon project scheduling in Nepal. In particular, local offices were often closed for up to two or three weeks during two of the larger Hindu festivals weeks. INGOs were closed for shorter periods of time during these festivals but there were few expectations by donors to meet deadlines during these periods.

Seasonalities dictated by macro-level organisations affected the availability of jobs from clients. For example, government departments aimed to start projects before the start of the monsoon and, as such, advertised jobs from November to February/March; for Canadian INGOs, the financial year finishes in March, so the peak time for jobs was April/May; and for Plan International jobs, the busy time was July. During these periods, ongoing project work in IDS-Nepal received a lower priority, as proposal work dominated resource usage.

5.2.1.5.Context – trends

The activities of IDS-Nepal were affected by government, technological and political trends.

Changes in government, rapid turnover of ministerial positions and increasing levels of corruption and nepotism in HMGN limited the effectiveness of interactions with government bodies.

Technologically, IDS-Nepal was working with sustainable technology, that is, low-cost appropriate technology, an emerging trend of community development agencies. For high-technology, large-scale projects IDS-Nepal aimed to provide the management of social and human aspects.

The political conflict was an ongoing trend that affected development activities. This was different from political shocks such as strikes or curfew as it provided a predictable, ongoing environment. The nature of work in affected areas often had to be modified to accommodate the demands of the local government. For those areas that were open to external community development agencies, visas or permits were often required. The local government often had its own development agendas and demanded outside projects to align themselves with these. Working in conjunction with local CBOs/NGOs was another common demand of the local government. Further, when working in conflict-affected areas the community was less likely to be cooperative out of fear of repercussions from the local government or for fear of becoming involved in a political situation. Additionally, the available labour force was decreasing due to the conflict. As community development agencies left Nepal due to the conflict, living conditions were getting worse and the local government was impacting more on daily life, causing an increase in the migration of able-bodied workers out of the villages to the safety of Kathmandu or India. Further, due to the conflict, the economic situation of Nepal was worsening and educated people were leaving the country in search of more opportunities.

5.2.1.6.Context – shocks

Shocks affecting the processes of IDS-Nepal included environmental, political and social as discussed below:

- environmental shocks such as floods and landslides affected access and progress of projects and affected the livelihoods of the rural poor;
- social commitments of staff including exams, assignments, weddings etc; and

- political strikes limited the accessibility of the head office due to the temporary closure of public transport services and private vehicles; out of fear of recriminations many people do not leave their homes during this time.

5.2.2. The move towards sustainable livelihoods

The sustainable livelihoods approach was initially introduced to IDS-Nepal in 2002 by Mr Warin Nitipaisalkul, a civil/environmental engineering student from the University of Technology, Sydney. Senior management staff identified their current practice with several of the key components of the approach, in particular, livelihoods outcomes, people-centred focus, sustainability and building on strengths. This was sufficient initiative to instigate further learning about the approach.

Mr Nitipaisalkul followed this in 2002–2003 with an introductory seminar, distribution of guidance materials and the development of a monitoring and evaluation programme based on SL (Nitipaisalkul, 2002).

Proposals and concept papers developed by IDS-Nepal since its introduction to SL integrated some aspects of the approach such as working with the community and establishing CBOs for the management of the project after completion of work by IDS-Nepal.

5.3.Cycle 1 analysis

The key findings from the first cycle of data collection identified many serious and more informal primary-task and issue-based systems of IDS-Nepal. These included:

- a system to assist the sustainable and equitable development of community infrastructure and improve the livelihoods of the rural poor;
- a system to adopt the SL approach;
- a system to investigate and strengthen the activities and processes of community based organisations in Nepal;
- a system to produce high-quality outputs;
- a system to develop low-cost appropriate technology for rural communities;
- a system to produce reports for large national and international donors;
- a system to implement projects for large INGOs;

- a system to sustain itself financially;
- a system to teach volunteers about Nepali culture; and
- a system to make the employee work environment satisfying.

In addressing the research hypothesis, the first two were identified as key problem situations, and were adopted for further analysis. Sections 5.3.1 and 5.3.2 synthesise systems models for the ideal situation of these problem situations and analyse the surrounding contexts. Comparisons between the existing practice and ideal practice were used to finalise an holistic enquiry to highlight the disparities between these for the case-study NGO.

5.3.1. Assisting sustainable and equitable development of community infrastructure

The primary task of IDS-Nepal is based upon the mission statement of the organisation and its working approach of people's participation and community-based programmes. The tasks and links of the system are summarised in the conceptual model of Figure 13, developed through the analyses with IDS-Nepal.

Box 1 defines this system with a root definition and CATWOE analysis.

Box 1 – defining the primary-task system

C: customers: rural community

A: actors: staff of IDS-Nepal

T: transformation: unsustainable/inequitable use of infrastructure in rural communities → sustainable/equitable use of infrastructure

W: Weltanschauung: appropriate use of infrastructure and greater livelihoods reduces poverty in rural communities

O: owners: IDS-Nepal, government, donor, rural community

E: environmental constraints: political conflict, environmental conditions, government restrictions, social and spiritual commitments, community subsistence activities

ROOT DEFINITION: A system jointly owned by IDS-Nepal, the government, donors and the rural community, and operated by the staff of IDS-Nepal to provide infrastructure to be sustainably and equitably used by the community and to improve livelihoods to reduce poverty in rural communities.

An analysis of the intervention of the primary-task system illustrated that IDS-Nepal filled the key roles of would-be problem-solver, client and problem-owner.

Table 20 characterises the social positions of IDS-Nepal, the rural community and the donor within this system.

Table 20: Social analysis of the system for the primary task of IDS-Nepal

	Roles	Norms	Values
IDS-Nepal	engineer, community facilitator, technician, organisation manager	technical design, community/client/policy-maker relationship building, quality control networking with partners, financial management, organisational, human resource and technical development, marketing	professional image, community acceptance, quality outcomes, staff security, sustainability, equity, innovative work, independence, creativity
Rural community	aid recipient, technician, engineer	to receive aid; participate when/where told, cash donations, labour	community values were not explored
Donor	client, donor, project manager, financial manager, public relations manager	understanding of project requirements, budgeting, timeline, quality control	value for money, speed, adherence to contract details, willingness to conform, flexibility, staff security

The intervention and social analyses above indicated the nature of the politics of the system. Whilst working with participatory methodologies, IDS-Nepal guided the local scope and scale of the project. The rural community had little power, and participated as directed by IDS-Nepal. However, due to its funding support the donor was able to direct the nature, scale and duration of the project. Thus, the donor had the ultimate power in the system.

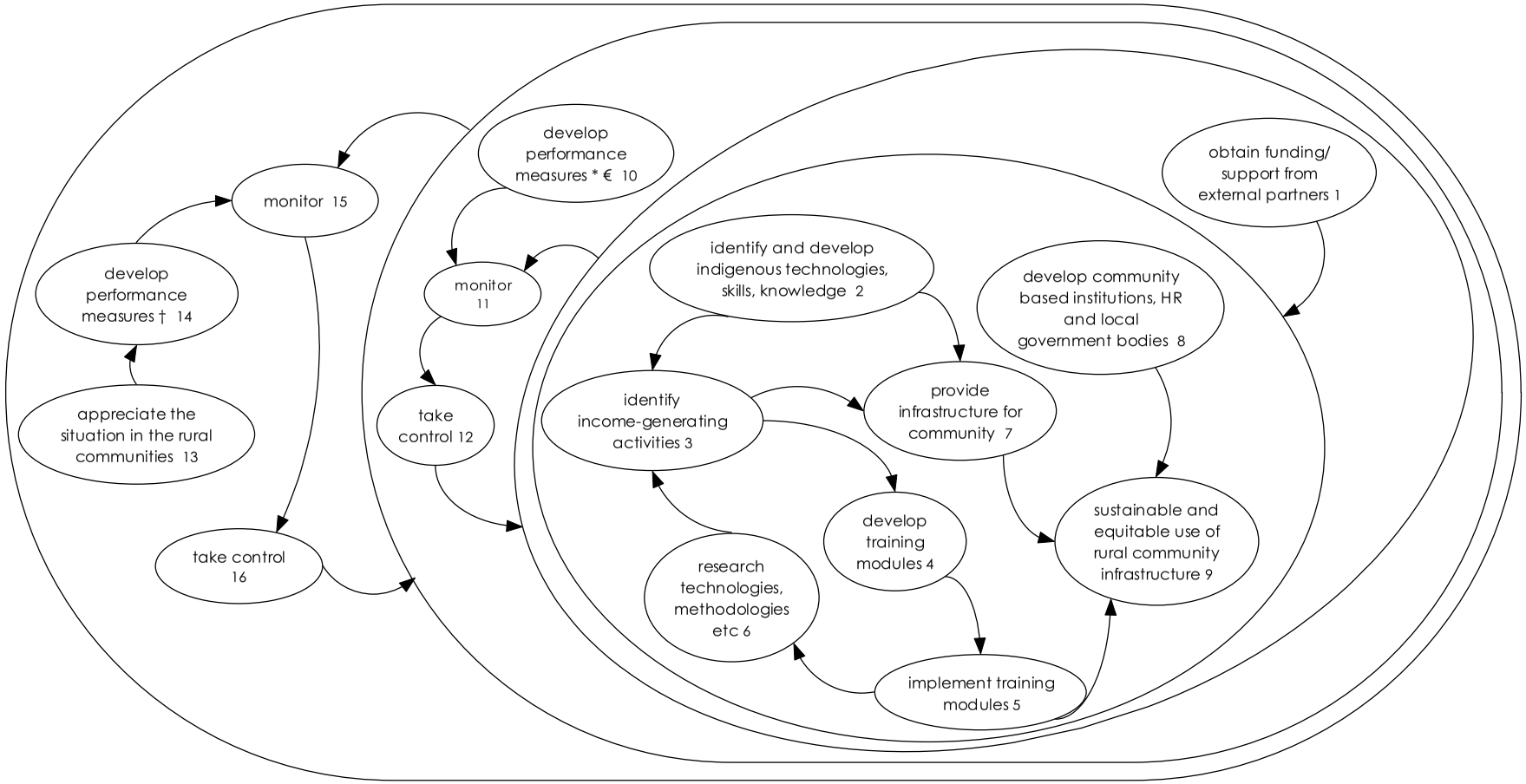
5.3.1.1.Cultural and feasible changes

A comparison of the idealised conceptual model of Figure 13 with the existing system is summarised in Table 21. This comparison identified the disparities between existing practice and the idealised practice and the challenges and limitations to best practice in this system in the context of IDS-Nepal. Major limitations included:

- unequal power relationships with donors, manifested in IDS-Nepal's inability to conduct appropriate monitoring and evaluation and difficulties in obtaining funding. These issues are investigated further in section 5.5.3 ; and
- an inappropriate role of technology, explored in more detail in the system in section 5.7.2.

Whilst SL was not a focus of this primary-task system, it was also evident that awareness of the approach was lacking. This was particularly so regarding needs identification and prioritisation, the role of income-generating activities, the lack of people-centred focus of the NGOs activities and the absence of appropriate methodologies. The system for developing more applicable SL skills is explored further in section 5.7.1.

Figure 13: Primary task system of IDS-Nepal



* efficacy: are we providing appropriate infrastructure and improving livelihoods?
€ efficiency: is the amount of effort worthwhile?
† effectiveness: are we reducing poverty?

Table 21: Comparing models with reality: providing community infrastructure and improving livelihoods

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
1 – obtain funding/support from external partners	Yes	Proposals, concept papers, grants etc.	The external partner (donor) had the power.	This lack of power is the primary limiting factor for IDS-Nepal's activities.
2 – identify and develop indigenous technologies, skills and knowledge	Yes	Observation of skills, technologies etc during work with community. Additional research and development were carried out independently.	IDS-Nepal controlled this process.	Top-down approach with community, that is, technology transfer versus developing community-based technologies. IDS-Nepal did not identify this as a problem situation.
3 – identify income-generating activities	Yes	IDS-Nepal incorporated a micro-enterprise element into most energy, water etc. programmes.	IDS-Nepal dictated these opportunities, relating them to the technology it was introducing.	IDS-Nepal considered this the primary activity of SL programmes. This indicated only a shallow awareness of the SL approach.
4 – develop training modules	Yes	IDS-Nepal developed training programmes.	Need and scale assessed by IDS-Nepal in consultation with donor.	Donor/IDS-Nepal determined the need and implementation for training, not the community, which conflicts with the people-centred focus of SL.
5 – implement training modules				

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
6 – research technologies, methodologies etc.	Yes	IDS-Nepal identified technologies through existing projects	IDS-Nepal determined the relevance of technologies to each community-based on field experience.	Community-based technologies were developed for subsequent projects, in a top-down approach.
7 – provide infrastructure for community	Yes	A top-down approach was used whereby the technology to be implemented and an appropriate community and work schedule were identified and developed by IDS-Nepal or the donor.	IDS-Nepal and donor judged 'needy' communities and their needs.	This was not consistent with the SL approach. Awareness and use of SL needs greater promotion in both the NGO and donor.
8 – develop community-based organisations, HR and local government bodies	Yes	Where appropriate, financial, management and technical training was held for existing community-based organisations.	The community and IDS-Nepal determined appropriate organisations.	This was a key focus of IDS-Nepal's activities, consistent with the SL approach.

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
9 – sustainable and equitable use of community infrastructure and improved livelihoods	Primary goal for IDS-Nepal			
10 – develop performance indicators for efficacy and efficiency	Yes	Donor assessed efficacy and the degree of completion. Efficiency was not assessed.		IDS-Nepal was largely controlled by the donor and therefore had little influence over the amount of its input into a project.
11 – monitor				
12 – take control				
13 – appreciate the situation of the rural community	Yes	Baseline studies (largely quantitative) indicate the situation of the poor.	Donor judged the project priorities. Through concept papers IDS-Nepal promoted priorities based on its experience and knowledge.	Whilst IDS-Nepal appreciated the perceived situation of rural communities, the community itself was not given sufficient programme space to express its goals, strategies and limitations. This is inconsistent with the SL approach.
14 – develop effectiveness performance measures	Top-down, if any, approach to monitoring and evaluation was led by the donor. M&E was primarily a quantitative analysis of infrastructure provided and number of participants. Once the project was completed, no further monitoring or changes were			

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
15 – monitor	undertaken.			
16 – take control				

5.3.2. Adopting a sustainable livelihoods approach

The finding-out phase of the first cycle of data collection in section 5.2 identified the adoption of the SL approach as a priority problem situation for the research. The idealised change in engineering–based practice by IDS-Nepal to the SL approach is summarised by the following transformation as presented in Box 2. The conceptual model of Figure 14, developed during the workshops and subsequent analyses, illustrates the tasks for this system.

Box 2 – defining system 2

INPUT	***TRANSFORMATION***	***OUTPUT***
Theoretical knowledge of SL approach	→	*Project implemented through SL lens*

C: customers: the rural community

A: actors: IDS-Nepal

T: transformation: change in practice to enhance practical application of SL knowledge

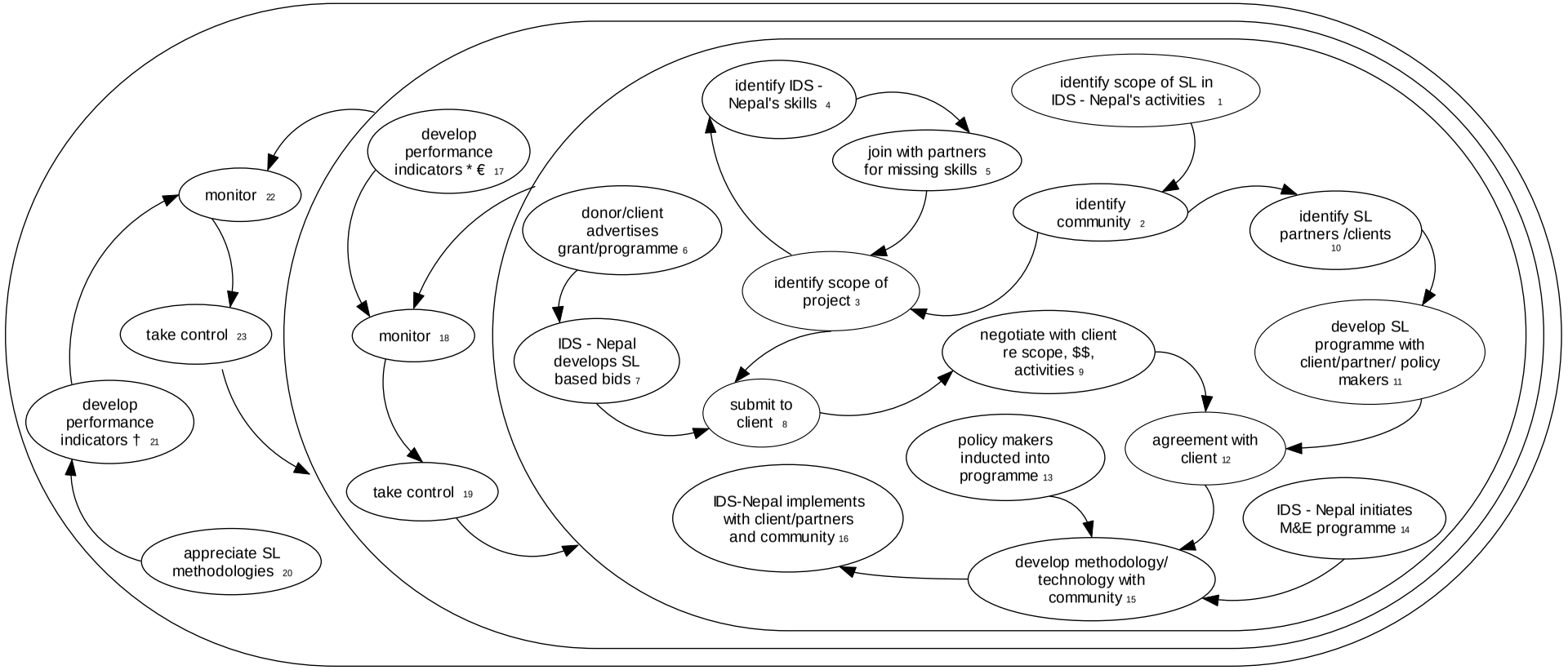
W: Weltanschauung: SL approach will enhance the livelihoods and thus reduce poverty in the rural poor

O: owners: IDS-Nepal

E: environmental constraints: donor-led development, political conflict, lack of understanding of the approach by the donors, time, financial sustainability of IDS-Nepal

ROOT DEFINITION: An IDS-Nepal owned and operated system to implement changes to enhance practical application of SL knowledge for engineering practice, in an environment dominated by the donor and political conflict, during a time of poor awareness of the approach, to improve the livelihoods of the rural poor.

Figure 14: Implementing activities through an SL framework



* efficacy: are we implementing with a SL approach?
€ efficiency: are the time/$$ inputs worthwhile?
† effectiveness: are we improving the livelihoods of the rural community?

As noted in the analyses of section 5.3.1, IDS-Nepal, in the role of engineer and technician and community mobiliser, guided the scope and scale of the project at the community level, during which the community contributed as directed. Again, the donor dictated the terms of reference to IDS-Nepal and had ultimate control over quality, timing and budget. This was typical of the top-down management style of traditional engineering practice.

5.3.2.1.Changes: systemically desirable and culturally feasible

A comparison between the conceptual model of Figure 14 and the existing system highlighted the challenges and possibilities for practice in the system. These are summarised in Table 22.

IDS-Nepal attempted to implement its activities with an SL focus through three approaches:

(i) Adding a SL focus to advertised projects, where the donor already defined the scope of works.

(ii) Developing a SL focus in concept papers submitted to clients for grants or funding.

(iii) Developing a SL focus in conjunction with donors, as partners.

From the analyses of section 5.3.1, the preceding part of section 5.3.2 and the comparison of the conceptual model with reality, IDS-Nepal achieved the greatest success with the first two of these above approaches. These were, however, dominated by the needs and demands of the donor, limiting the flexibility and methodologies of the activities. The applicability of SL, in the first approach in particular, was limited due to the tight scope of advertised projects, often focused on only one phase of a programme. The second approach too was limited, as budgets and timeframes for SL-type projects were often less competitive than traditional approaches. The third approach, in which IDS-Nepal had greater power, was needed in order to achieve greater success with the SL approach. IDS-Nepal's ability to work through this approach with greater donor relationships is explored further in section 5.5.3

The importance of community participation is highlighted in the SL approach. However, the system explored lacks such community participation. Greater partnerships with donors confer greater power to IDS-Nepal allowing it greater flexibility in its

timeframes and methodologies. More power can subsequently be passed on to the rural community with which IDS-Nepal works, as explored further in section 5.5.1.

Other changes to practice identified by the systemic analysis of IDS-Nepal adopting SL projects include:

- a more strategic approach to projects through SL, identifying the scope for the approach in its activities, resources and time allocations, to improve efficiency;
- addressing risk;
- the need to develop project-wide macro-micro links and appropriate methodologies;
- improved monitoring and evaluation practices;
- a more community-based focus for technology; and
- a greater understanding of the SL approach, particularly relating to the holistic nature of people's livelihoods and participatory methodologies.

The latter four issues are explored further through subsequent analyses.

Table 22: Comparing models with reality: implementation through SL framework

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
1 – identify scope of SL in IDS-Nepal's activities	Yes	Informal discussion	Strategic planning of IDS-Nepal's Management Committee	Planning was not followed up.
2 – identify community	Yes	Based on previous field experience	Management Committee or donor determines community's need.	This conflicts with the bottom-up focus of the SL approach.
3 – identify and develop scope of SL project	Yes	Informal discussion	Management Committee	SL was incorporated as a last phase of a technology project, showing a lack of awareness of the SL approach.
4 – identify SL skills in IDS-Nepal	Yes	Informal discussion	Management Committee	Focus was particularly on technical and social science skills. Little awareness of role of policy, health, forestry, etc.
5 – join with partners for missing skills	Yes	Networking	Management Committee	
6 – client advertises project	Yes	Newspaper	Management Committee	IDS-Nepal had no control over the scope of the programme.

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
7 – IDS-Nepal develops SL-based bid	Yes	Technical bid was developed; SL factors were added on completion of bid.	Management Committee assessed opportunities and risks based on other known applicants	Bid was developed according to Terms of Reference and in order to achieve lowest price and quickest time to be competitive. SL was secondary to technical bid. Too much risk was involved in SL approach for donors who were not aware, that is, extended time schedules, budgets etc. Perceived inability to use SL in one-phase projects as advertised by donors.
8 – submit to donor	Yes		Ranked according to technical and financial bids.	Donor held ultimate power. Generally, the financial bid was the primary determinant of the success of the bid.
9 – negotiation on scope/ activities/value with donor	Yes	Discussion	Donor	If bid was successful, donor may have negotiated on some aspects.

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
10 – identify SL donors/ partners	Yes	Networking with existing donors/ partners with SL involvement.		In Nepal, there were limited SL partners. The bigger partners were less willing to share knowledge.
11 – develop SL programme with donor/ partners	Yes	Ongoing discussion/ networking.	Donor	Donor held the ultimate power.
12 – donor and IDS-Nepal agree	Yes		Donor and IDS-Nepal formalised agreement through written contracts.	
13 – policy-makers inducted into project	No			New methodologies to be developed. IDS-Nepal did not consider this to be a problem situation.
14 – IDS-Nepal initiates M&E programme	No			New methodologies to be developed. Some work had been done on this previously, but it was not receiving high priority with IDS-Nepal.

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
15 – develop methodology/technology with community	No	Top-down approach	IDS-Nepal	Technology and methodology developed by IDS-Nepal. Little effective communication of the effect of technology on community goals and strategies was obtained.
16 – IDS-Nepal implements with partners/community etc	Yes	Top-down approach	IDS-Nepal and donor	Little time afforded to developing rapport with community. Community contribution of cash and labour.
17 – define performance measures (efficacy, effectiveness)	Yes	Qualitative/ quantitative assessment	IDS-Nepal and donor	Efficacy: donor and IDS-Nepal monitored progress according to contract. Efficiency: donor had ultimate control over quality so IDS-Nepal had to put effort in where required.
18 – monitor				
19 – take control				
20 – appreciate the purpose of SL approach	Yes		IDS-Nepal develops skills and knowledge largely through literature.	IDS-Nepal was developing an understanding of the true extent of the approach. It was previously thought that SL focused purely on sustainable income-generating activities.

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
21 – define performance measures – effectiveness	No			No long-term measure of the impact of the project on livelihoods and poverty reduction.
22 – monitor				
23 – take control				

5.4.Cycle 2 key findings

Primary data collection for the second cycle of analysis was conducted through Workshop 3, held on 20 May 2004 with a junior environmental scientist and the Programme Manager. The purpose of this workshop was to review the SL framework, to investigate the systems to implement the core concepts of SL and to further explore some of the systems identified by the previous cycle of analysis.

The following sections are the results of the workshop, detailing IDS-Nepal's approach to each of the core SL concepts.

5.4.1. Holistic development

IDS-Nepal aimed to address the multiplicity of people's livelihoods primarily through developing capacity within associated sectors, such as education, finance and health. A variety of actors were incorporated into the programmes, such as VDCs, DDCs, line agencies, other NGOs and local CBOs that often represented the users' committees. However, whilst incorporating a variety of sectors and actors into the programme, a true understanding of the various external influences and livelihood strategies and outcomes of the community was rarely achieved or used to develop effective and appropriate interventions.

5.4.2. People-centred development

In the needs analysis and problem identification phases community participation was largely based on a consultative process, whereby the community was incorporated through questionnaires and surveys regarding its existing situation, its environment and its needs. In this process, the community had little power to express its strengths, objectives, strategies and limitations. The scope of a project was largely already defined by the donor, with IDS-Nepal primarily mediating between the scope of the donor and needs of the community. The community had little input during the development of the intervention. Feedback regarding the effectiveness of such a process was limited.

Effective community participation was further limited by:

- "Consultative needs analyses" which have been conducted since development projects began in Nepal in the 1950s. These often resulted in learned responses within the community, which did not reflect its real livelihood goals. Further, initial needs analyses often had no immediate or identifiable interventions

associated with them. In these cases, the community provided valuable time from its subsistence activities with little or no positive feedback. This led to a distrust of external organisations and subsequently superficial participation in later programmes.

- Political unrest bred fear and distrust of unknown individuals and organisations.

In the design and implementation phases, the community provided labour and often a cash contribution. The NGO/donor was the lead design specialist in a process that was primarily technology transfer in a supply-led programme. Again, the power was passed from the top downwards.

5.4.3. Dynamic development

IDS-Nepal's activities provided feedback into donor planning through periodic reviews. This feedback reflected the quantity and distribution of the infrastructure needs of the community as identified by the local CBOs over time. There were seldom structures or processes for long-term monitoring and evaluation of the effectiveness or relevance of interventions to community livelihoods.

5.4.4. Sustainable development

IDS-Nepal approached economic sustainability through the development of income-generating activities related to the core focus of the programme (such as off-season vegetable farming made accessible through the greater availability of water) or through the establishment of rolling funds and micro-credit organisations. Social sustainability was addressed largely in the needs analysis phases through CBOs and users' groups' analyses. Environmental sustainability was assessed in the needs analysis and design phases. Institutional sustainability was considered through developing capacity in local CBOs and users groups. In order to effectively facilitate these approaches to sustainability, IDS-Nepal used skills including engineering, environmental/natural resource management, community empowerment and sociology. In the absence of in-house skills, IDS-Nepal developed a network of potential partners in other sectors, focusing primarily on missing technical skills.

These elements of sustainability were largely identified and developed prior to project implementation, separate from the community they were intended to serve. Little

ongoing review of the success or community acceptance of these programmes was carried out.

5.4.5. Macro-micro links

IDS-Nepal developed links with other NGOs and INGOs through current projects and those previously implemented. These helped to establish links between community development organisations and government and to build IDS-Nepal's capacity as an equal partner in the development sector.

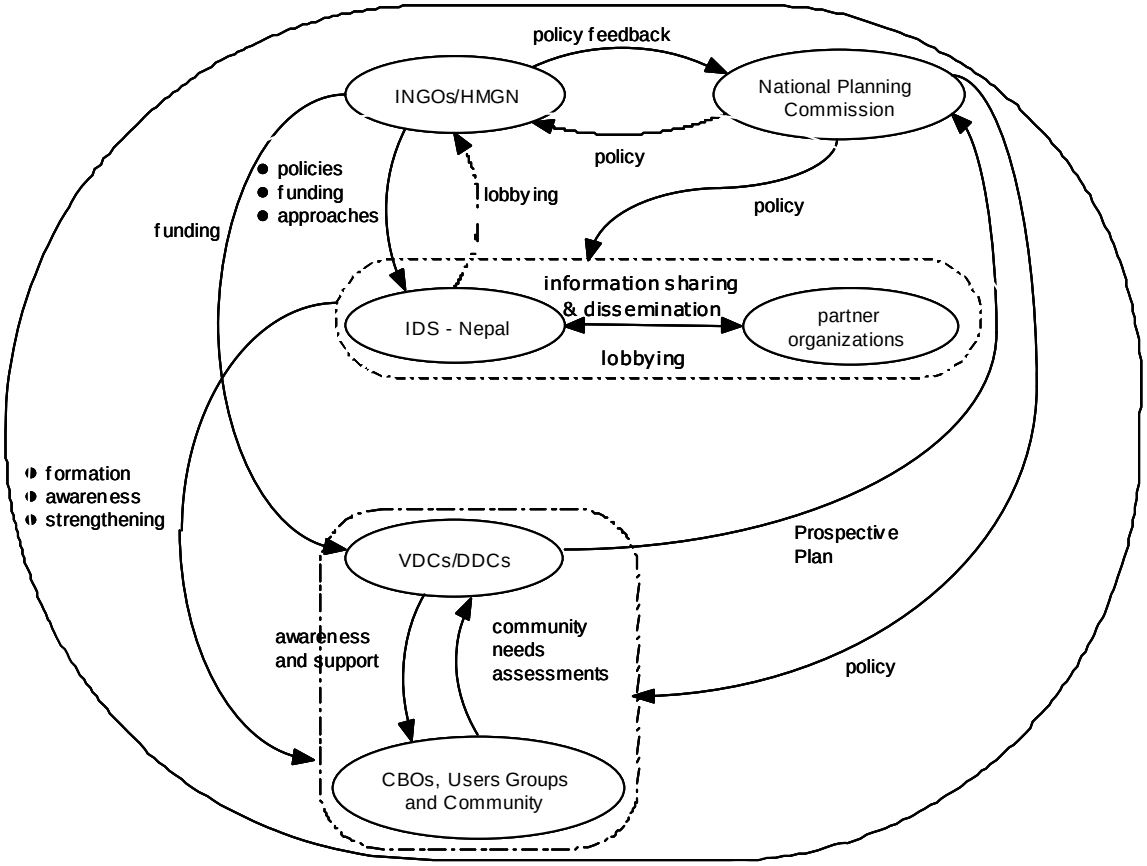
Limited links were made with higher-level policy-makers through research and development, particularly in the water sector. IDS-Nepal also provided feedback regarding its projects. This represented long-term project planning, however, versus policy change.

IDS-Nepal also worked with CBOs to develop their capacity and sustainability, in an environment where such organisations were established frequently at a local level and held little power beyond that level. IDS-Nepal aimed to build links so that programmes may be delivered through these organisations. Further, IDS-Nepal aimed to build the capacity of CBOs and community leaders so that they could more effectively campaign local-level Ward, DDCs and VDCs. These committees had a role in planning and policy at the local level, which collectively affects upper-level planners. These relationships are illustrated in Figure 15.

However, due to ongoing political unrest that involved many changes in government, continual turnover of ministerial positions and nationwide conflict, developing long-term links with high-level policy-makers was inhibited.

Further, there were numerous struggles to build a reputation with policy-makers for a relatively new organisation such as IDS-Nepal in a country where over 16,197 NGOs exist (NGO Forum for Urban Water and Sanitation, 2004).

Figure 15: IDS-Nepal's micro-macro links



5.4.6. Building on strengths

Community strengths were developed by IDS-Nepal projects through the formation and development of the capacity of CBOs. To avoid adding to the proliferation of these organisations, IDS-Nepal aimed to work with those existing organisations that were able to demonstrate effective processes and structures already in place. Community needs were identified through these organisations, training programmes were developed and links were formed with local-level governance bodies. In order to incorporate this into its programmes, IDS-Nepal aimed to build CBO capacity in activities separate to established programmes.

5.5.Cycle 2 analysis

From the results of section 5.4, the key issues affecting the problem situation for SL and IDS-Nepal included:

- donor-driven programmes;

- participation in only one phase of programmes;
- lack of true community participation and the need to develop a rapport, particularly during political conflict;
- lack of monitoring and evaluation;
- macro-micro links, which are a long-term investment, difficult in the current political situation; and
- developing an applicable, not merely a theoretical application of SL.

These tie into four major issues previously identified for IDS-Nepal and SL. They are the need for greater community participation; monitoring evaluation; partnerships with clients and policy-makers; and learning. The first three issues were identified as priority problem situations by the organisation and are analysed in sections 5.5.1, 5.5.2 and 5.5.3.

5.5.1. Meeting the need for community participation

Whilst IDS-Nepal attempted to incorporate the community into its activities, ineffective methodologies and a limiting external environment led to superficial community consultation that affected the scope and long-term viability of the project. The data from the surveys of the external stakeholders highlighted the poor approach to community participation by meso-level agencies.

The primary need for effective community participation is defined by the following transformation:

INPUT	***TRANSFORMATION***	***OUTPUT***
Need for local information, skills and technologies	→	*That need met*

Box 3 defines the system through a CATWOE analysis and a root definition. Figure 16 illustrates the model of the ideal system, as identified by the finding-out phase in the workshop.

Box 3 – defining the system for community participation

C: customers: the rural community

A: actors: IDS-Nepal

T: transformation: the participatory process

W: worldview: the community can best define its needs and have the most appropriate skills to ensure long-term sustainability of the project

O: owners: IDS-Nepal, the community, donors

E: environmental constraints: Time, political conflict, 50-year history of community development practice, lack of community understanding of the process, project is defined by donor.

ROOT DEFINITION: A system owned by the rural community, IDS-Nepal and donors, and operated by IDS-Nepal to undertake a participatory process to involve the community in all phases of a project previously defined by the donor, in a highly political context, with communities that have little knowledge of the development process but have been exposed to it for more than 50 years. This system exists to ensure long-term project relevance and sustainability.

An analysis of the ideal situation for developing community participation in conjunction with the cultural analysis of Table 20 indicates that IDS-Nepal as the 'client' and 'would-be problem-solver' had all the responsibility for change in the problem situation. However, sharing the role of problem-owner with the community and the donor forced IDS-Nepal to also share the capacity to make those changes. This removed a large proportion of the power and control from IDS-Nepal.

Again, timeframes and budgets dictated by the donor (which is the major power-holder in the system) limit the scope of IDS-Nepal's activities in this system. In this system, however, it is interesting to note the subtle power of the rural community, which determined its involvement. It defined numbers of participants, specific individuals participating, depth and accuracy of involvement.

5.5.1.1.Changes: systemically desirable and culturally feasible

Table 23 summarises the results from the comparison of the tasks and links of the conceptual model to those of existing IDS-Nepal practice. The major issues in the system were:

- lack of time/flexibility for adequate community participation (that is, the scope is donor-defined);
- lack of awareness of the role of community participation;
- insufficient participants; and
- inappropriate methodologies.

The major limitation in the system was the control by the donor, directly or indirectly. Directly, the donor affected the design of the projects. Indirectly, the donor limited the timeframe and budget, which then restricted the processes, methodologies and scale of the projects. This affected the opportunities to build an appropriate rapport and methodology with the community. It also limited opportunities for feedback and improvement of processes, as identified in previous systems.

Thus, for the case study of IDS-Nepal, systemically desirable changes include developing a more balanced power relationship with the donor in order to have greater control over all aspects of the project. Alternatively, the necessary flexibility of schedules, budgets and methodologies may be achieved by developing community development activities with donors who appreciate and/or utilise the modality of SL. In the competitive community development sector of Nepal the second option is considerably more 'culturally feasible'. These changes to donor relationships are examined as an independent system in section 5.5.3.

Additionally, the system was also limited largely by a lack of understanding and awareness of participatory methodologies and SL by IDS-Nepal. Improving awareness in IDS-Nepal is therefore a key element to improving this system. The ability and systems to achieve this are explored further in section 5.7.1.

Again, systemic control and communication regarding efficacy, efficiency and effectiveness was limited, largely due to restrictions from the donor and a lack of awareness of such methodologies.

Figure 16: Model of the system for gaining community participation

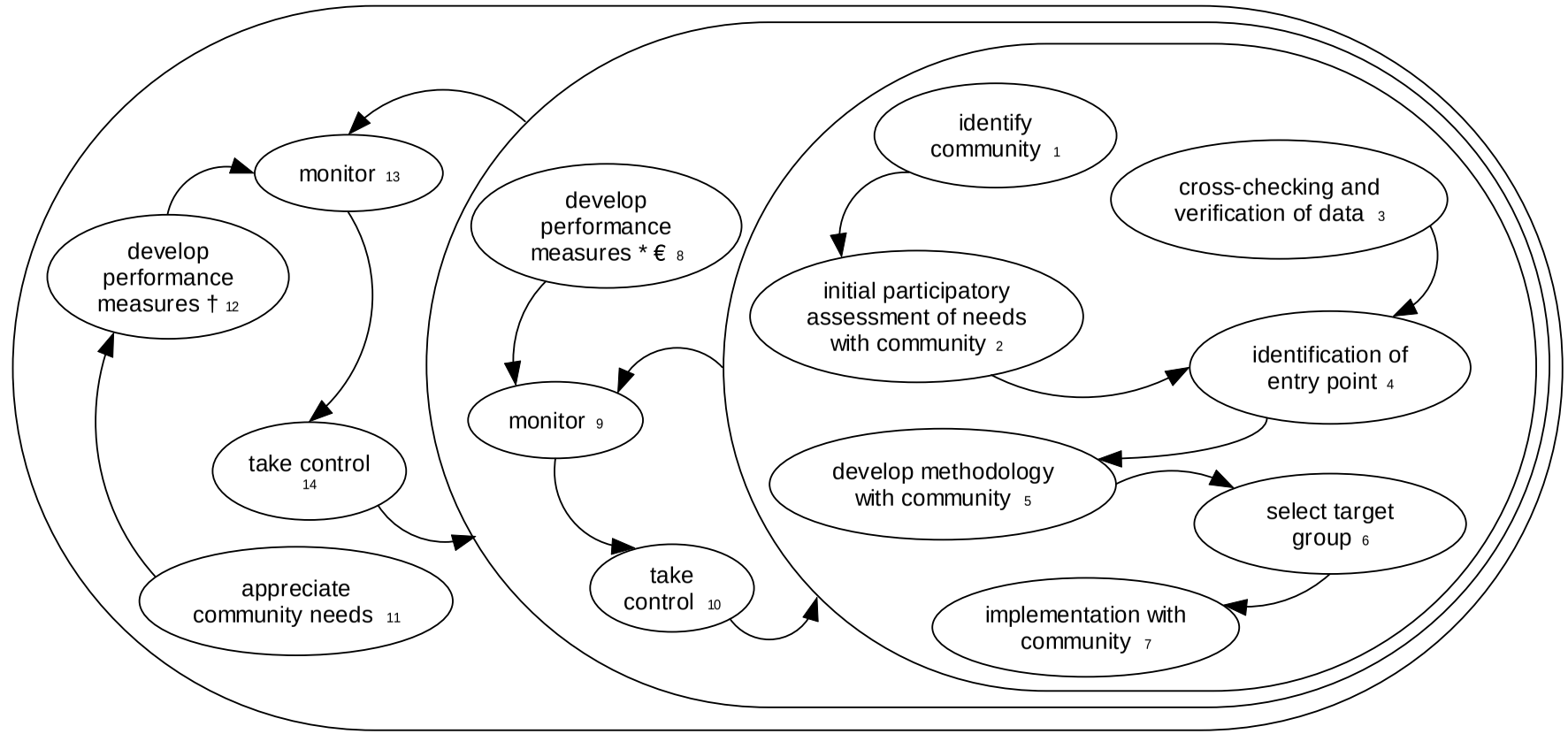


Table 23: Comparing models with reality: developing community participation

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
1 – identify community	Yes	Identification largely by donor. When IDS-Nepal had the scope, the selection was based on existing knowledge of communities.	IDS-Nepal or donor assessed need based on experience and knowledge of perceived community needs.	This is adequate for the SL approach.
2 – initial participatory assessment of needs with community	Yes	Baseline surveys carried out independently of design or implementation phases.	Assessed by IDS-Nepal in consultation with donor.	Assessment was carried out independently of community. Baseline surveys asked questions about health, infrastructure etc., but not about community livelihoods or priorities. Insufficient time, $$ and lack of awareness for thorough household assessment. This conflicts with SL approach, indicating a lack of awareness of the approach or an inability to conduct it.
3 – cross-checking and verification of data	Yes	Donor/IDS-Nepal's experience of community.	Assessed by IDS-Nepal in consultation with donor.	Participatory process was superficial, lacking cross-checking/verification mechanisms. This was partly due to insufficient time, money and a lack of awareness.

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
4 – identification of entry point	Yes	Based on predefined scope of works.	Assessed by IDS-Nepal in consultation with donor.	Entry point was not defined according to the priorities of the community, rather by predefined technology/infrastructure strategy of the donor or IDS-Nepal. This conflicts with SL approach, however, IDS-Nepal did not consider this a problem situation.
5 – develop methodology with community	No	Based on predefined scope of works/ timescale etc.		This conflicts with the SL approach.
6 – select target group	Yes	Based on Terms of Reference.	Assessed by IDS-Nepal in consultation with donor.	Often limited due to time, availability of community.
7 – implementation with community	Yes	Community provided cash and labour.		Methodology did not incorporate using the technical skills or local knowledge of the community.
8 – develop performance measures (efficacy and efficiency)	Yes	Verify accuracy and extent of completion.	Donor assessed these elements.	Donor had all the control over quality and quantity of expected output, so if more work needed to be done, then IDS-Nepal had to do it. Therefore, there was little check on IDS-Nepal's efficiency.

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
9 – monitor	Yes	Some cross-checking of data.		Verification of key SL participatory process was not carried out.
10 – take control	Yes	Results were adjusted as seen fit.		IDS-Nepal had little bargaining power regarding efficiency.
11 – appreciate community needs	No			No time or scope from donor's perspective.
12 – develop measures of performance				
13 – monitor				
14 – take control				

5.5.2. Monitoring and evaluation

Monitoring and evaluation (M&E) focusing on the livelihood outcomes of activities is a core concept of the SL approach. This allows interventions to adapt to the changes in people's livelihoods over time. However, effective M&E also helps IDS-Nepal to determine and take control over its own effectiveness, affecting the long-term organisational sustainability. The absence of M&E feedback loops has been noted by systems in Cycle 1 and the previous system of Cycle 2. The following tools describe the tasks and key players of the problem situation.

Box 4 – defining the system for monitoring and evaluation

ROOT DEFINITION: A donor-owned system, operated by IDS-Nepal with limited time, resources and finances, in order to develop a monitoring and evaluation programme to ensure the effectiveness, relevance and efficacy of interventions to enhance long-term sustainability for the benefit of the community.

C: customers: the rural community and IDS-Nepal

A: actors: IDS-Nepal

T: transformation: refine M&E programme

W: worldview: effectiveness, relevance and efficacy can improve the long-term sustainability of an intervention and the organisation

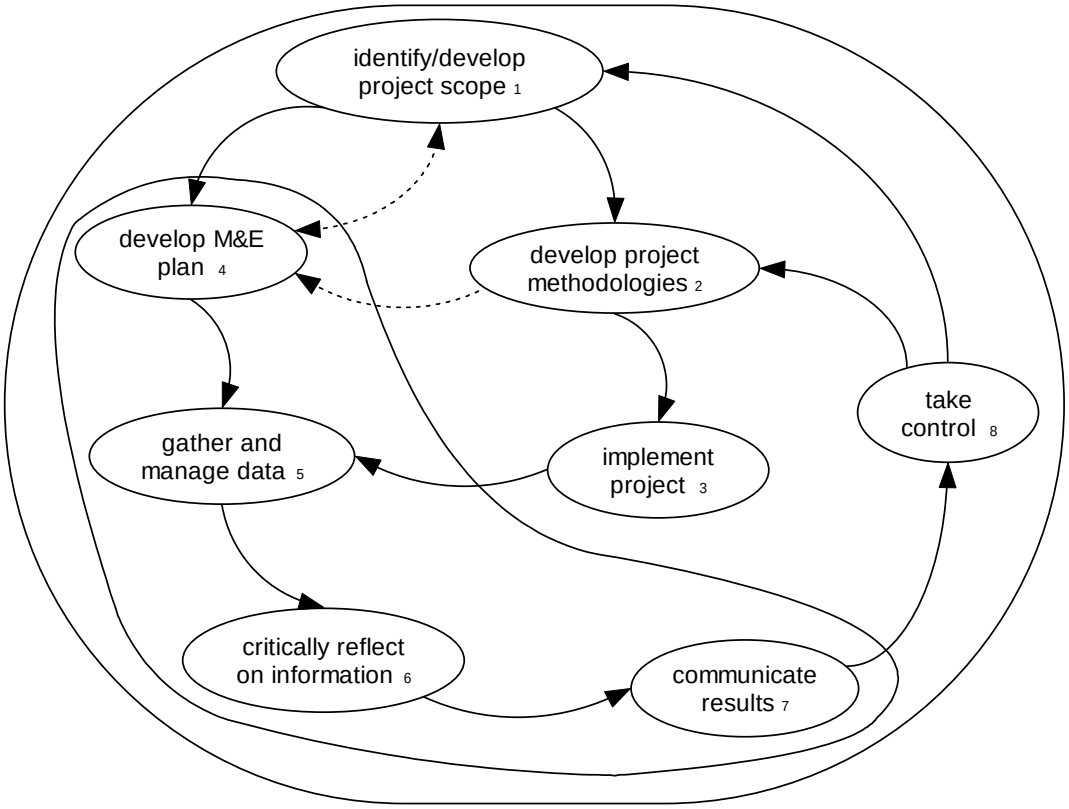
O: owners: the donor

E: environmental constraints: time, resources, available finances

Figure 17 is the basis for the following analysis for the NGO of the case study.

An analysis of the roles, expected behaviours and power balance between the two key players in the system for monitoring and evaluation, as explored in section 5.3, highlights the power being held over IDS-Nepal by the donor. The imbalance was even stronger in this system as IDS-Nepal was the donor, would-be problem-solver and problem-owner, but shared the last role with the donor. In this case, IDS-Nepal held all the responsibility for changing the system but none of the control, emphasising yet again, the importance of working in partnership with the donor, versus in a top-down relationship.

Figure 17: Monitoring and evaluation in the context of project implementation



(adapted from IFAD, 2002)

5.5.2.1.Changes: systemically desirable and culturally feasible

The preceding analysis of the power relations between the two major players in the system is an indication of the changes required. In order to have greater control over the monitoring and evaluation programme, IDS-Nepal needs greater equality and input in its activities. A greater power balance allows more flexibility in the nature and implementation of its activities. Possible changes to enhance this relationship are analysed further in section 5.5.3.

The comparison of the ideal situation modelled in Figure 17 and the reality in IDS-Nepal as summarised in Table 24 illustrates the need to develop a greater understanding of participatory M&E skills, internal M&E systems (particularly to monitor efficiency) and livelihood indicators.

Table 24: Comparing models with reality: refining M&E programme

<table>
<tr><th>Activity</th><th>Exist or not in real situation</th><th>How is it done?</th><th>How is it judged?</th><th>Comments</th></tr>
<tr><td>1 – identify/develop project scope</td><td>Yes</td><td>Donor defined through Terms of Reference (TOR).</td><td>Donor</td><td>In the majority of cases IDS-Nepal had little control over project scope.</td></tr>
<tr><td>2 – develop project methodologies</td><td colspan="4" rowspan="2">Systems explored previously in section 5.3.1.</td></tr>
<tr><td>3 – implement project</td></tr>
<tr><td>4 – develop M&E plan</td><td rowspan="5">Yes</td><td rowspan="5">Efficacy and effectiveness: donor conducted M&E focused largely on quantity of infrastructure/ number of participants.
Efficiency and efficacy: little internal review of processes by IDS-Nepal.</td><td rowspan="5">Donor</td><td rowspan="5">Donor had ultimate say over the implementation of activities, quality etc.
IDS-Nepal had little understanding of outcome-focused monitoring.</td></tr>
<tr><td>5 – gather and manage data</td></tr>
<tr><td>6 – critically reflect on information</td></tr>
<tr><td>7 – communicate results</td></tr>
<tr><td>8 – take control</td></tr>
</table>

5.5.3. Developing partnerships

Whilst IDS-Nepal was developing partnerships within its sector and at the community and local governance level, additional effort was required to strengthen relationships with higher-level policy-makers and donors in order to ensure that policies are reflective of the community context and needs. These needs have been illustrated throughout the analyses of the previous systems and were also issues for external stakeholders who worked largely with the lower level governance bodies. Stronger partnerships will also enhance power relations and provide more flexibility in the activities of IDS-Nepal, a need identified by all the previous systems. The transformation required by the following system is summarised below and explored in the subsequent analyses summarised in Box 5. Figure 18 illustrates the conceptual model for this system.

INPUT	***TRANSFORMATION***	***OUTPUT***
Unequal relationship between IDS-Nepal and policy-makers/donors	→	*Greater equality in relationships with macro-level stakeholders*

Box 5 – defining the system for greater partnerships

ROOT DEFINITION: A policy-maker/donor-owned system, operated by IDS-Nepal for its own benefit, to develop greater relationships with policy-makers/donors to enhance its own ability to deliver projects with an SL approach and for improved impact on policy, restricted by IDS-Nepal's time, money, resources, and the desire of donors/policy-makers to participate.

C: customers: IDS-Nepal

A: actors: IDS-Nepal

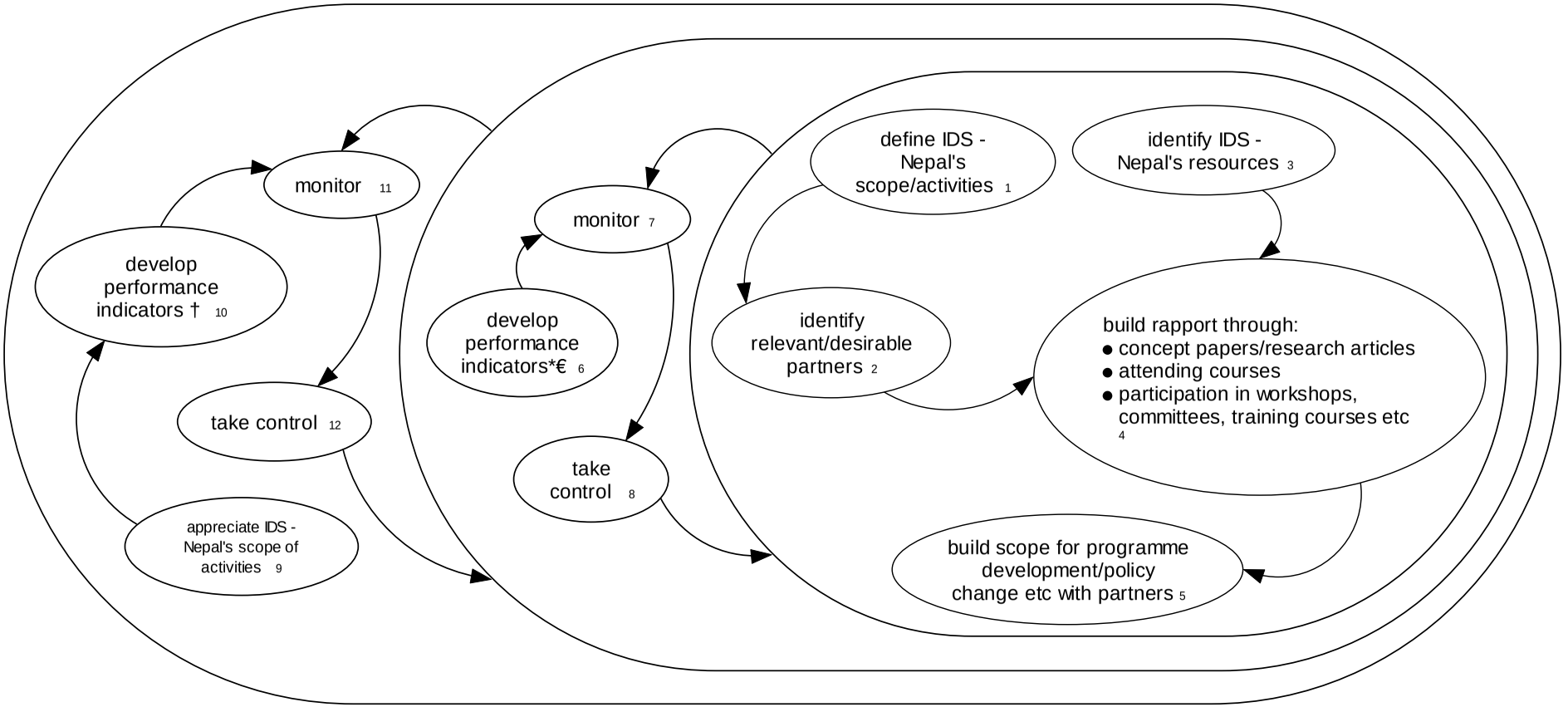
T: transformation: relationship-building

W: worldview: greater power balance in relationships can enhance IDS-Nepal's ability to deliver projects with an SL approach.

O: owners: policy-makers/donor

E: environmental constraints: time, money, resources, availability and desire of donors/policy-makers, political context, development sector context.

Figure 18: System for developing partnerships



* efficacy: have we developed partnerships
€ efficiency: was resource use a minimum?
† effectiveness: do we have more control over our activities?

5.5.3.1.Changes: systemically desirable and culturally feasible

Limitations, challenges and opportunities for best practice for this system were highlighted by the comparison of the ideal system of Figure 18 and the existing practice of IDS-Nepal, as summarised in Table 25. The greatest external limitations to developing effective partnerships at both the partner and donor levels were the relative youth of IDS-Nepal and its low profile in the Nepali development sector, and the subsequent lack of power. A long-term commitment to increasing the profile of the NGO is required. Ongoing feedback, education and reporting to policy-makers and clients can raise the profile of IDS-Nepal and increase opportunities for relationship-building. Seeking out new partners who are aware of the SL approach introduces greater possibilities for flexible programming and methodologies.

Internally, IDS-Nepal needs a more strategic approach and better use of human resources to maximise the effect of relationship-building.

Table 25: Comparing models with reality: developing equity in relationships

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
1 – define IDS-Nepal's activities	Yes	Strategic planning	Management Committee	Due to the organisation's dependency on projects for financial survival, strategic focuses were sometimes lost.
2 – identify relevant/ desirable partners and scope for relationship	Yes	Networking with existing partners, existing social networks	Management Committee	Need to branch out, identify new partners. More strategic approach needed.
3 – identify IDS-Nepal's resources	Yes	Unorganised. Whoever made the first contact	Management Committee	Needs review for better use of resources.
4 – build rapport	Yes	– develop/submit concept papers, research articles – attend courses – participate in meetings/ steering committees	Management Committee	IDS-Nepal's activities were appropriate.
5 – open discussion for programme development	No			Ideal relationship yet to be achieved.

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
6 – define performance measures	Yes	Informal review meetings	Management committee	
7 – monitor	Yes	Informal review meetings		The balance of power and ability to affect partners defines the success of the relationship.
8 – take control	No			Efficacy: IDS-Nepal had little control over relationship-building. Efficiency: due to the youth of the organisation, a large input was required to build its reputation.
9 – appreciate IDS-Nepal's scope of activities	Yes	Management Committee meetings	Open discussion	Problem situation was appreciated, but IDS-Nepal had little power in partnerships.
10 – develop performance measures (effectiveness)				
11 – monitor				
12 – take control				

5.6.Cycle 3 key findings

A final cycle of investigation of IDS-Nepal was conducted, based on Workshop 4 held on 13 September 2004 with the Programme Manager and a junior environmental scientist. The aim of this cycle was to review previously identified problems and opportunities for SL practice in engineering SL and to explore additional systems identified through the second analysis.

The key problem situation identified through the previous analyses and further highlighted through this cycle of data collection was the lack of adequate processes for acquiring and developing SL skills and knowledge. Several factors pointed to their lack of SL awareness including:

- insufficient community participation. Community consultative methodologies versus participatory methodologies were being used. This was partly attributed to the current political conflict and partly to a lack of awareness of the SL approach.[14]
- the lack of diversity of skills incorporated in engineering activities;
- the absence of effective monitoring and evaluation during its activities, ignoring the effect of changing community livelihood outcomes; and
- the incorporation of SL in project proposals/concept papers in the last stage of project design only.

Whilst SL workshops had been conducted for IDS-Nepal staff, the participants felt that they had insufficient applicable understanding of the impacts of SL and were not able to competently analyse a community through the framework. Due to the absence of SL-based activities in IDS-Nepal's current workload, the need to improve SL knowledge

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[14] The Programme Manager highlighted the inadequacies of current community participation methodologies:

> *The really vulnerable do not know what their real problems are or they regurgitate what the last donor told them was their problem, so IDS-Nepal makes its own judgement as to what their needs are. This is often the most basic level needs in the community such as water supply* (IDS-Nepal Programme Manager, 2004).

and skills was small. The survival of IDS-Nepal was considered a far greater priority, thus requiring greater resources and time.

The previous analyses also identified a strong contrast between the role of technology in IDS-Nepal and that for SL.

5.7.Cycle 3 analysis

5.7.1. Learning about SL

One of the greatest problems faced by IDS-Nepal identified throughout all of the previous systems was developing applicable and not merely theoretical knowledge of the SL approach. This system aimed to address the following transformation:

INPUT	***TRANSFORMATION***	***OUTPUT***
Little knowledge re SL approach	→	*Greater applicable knowledge of SL approach*

The CATWOE analysis and root definition summarised in Box 7 provide the basis for the conceptual model, developed in Figure 19, of the ideal system for learning about SL in IDS-Nepal.

Box 7 – defining the system for learning about SL

C: customers: IDS-Nepal

A: actors: IDS-Nepal

T: transformation: knowledge acquisition

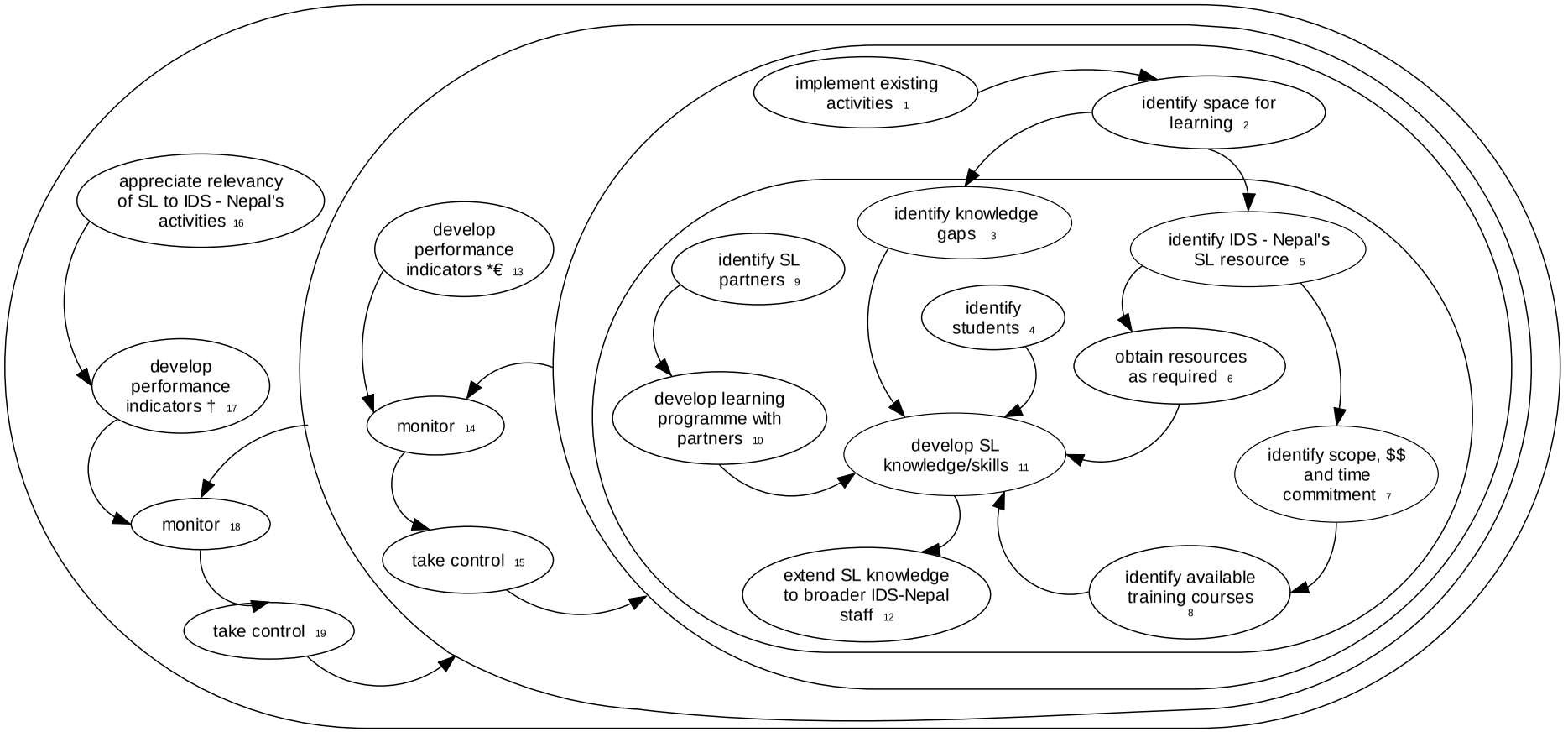
W: worldview: greater knowledge means greater competency in the approach.

O: owners: IDS-Nepal

E: environmental constraints: time, resources, money, available training, existing organisational knowledge

ROOT DEFINITION: An IDS-Nepal-owned and -operated system for gaining theoretical and practical knowledge of the SL approach, using available organisational time, resources and money and external training, to enhance IDS-Nepal's competency.

Figure 19: Learning about the SL approach



* efficacy: are we learning/developing SL skills?
€ efficiency: is the amount of effort worthwhile?
† effectiveness: are we able to implement SL programme?

The following cultural analyses enhance the holistic enquiry of this system. In a system owned and controlled solely by IDS-Nepal, its key roles were as student and teacher.

An analysis of the power balance in this system differs from that of other systems summarised in Table 20 that involved external partners. In this system, however, there were internal power balances within the organisation. These were based on the identification and prioritisation of activities for junior staff by the Management Committee, affecting the time and resources dedicated to learning about SL. Whilst junior staff were aware of their need to learn, their time was committed to other tasks by the Management Committee. Junior staff could affect practice relating to SL if they committed time outside their formal working hours to develop their awareness.

5.7.1.1.Changes: systemically desirable and culturally feasible

The major limitations of this system, identified through the comparison process in Table 26, involved four main issues:

- lack of awareness of SL approach;
- lack of a strategy for learning;
- lack of appropriate partners; and
- low priority/high risk of change and learning.

The first issue is a cyclical issue related directly to learning. In order to define the need for ongoing learning and its scope, some initial awareness of the approach was needed.[15]

Thus, it is a key task of the learning programme to identify the role and space for learning within the organisation.

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[15] A key indicator of the need for a basic level of understanding to promote further learning, was provided by the IDS-Nepal Chairman, in his lack of awareness of the true implications of SL:

> *what you are doing is SL, what the Programme Manager is doing is SL, what I am doing is SL which means that we as IDS-Nepal are doing SL* (IDS-Nepal Chairman, 2004).

The second issue identifies a need for a strategic commitment by IDS-Nepal regarding time and resources availability for learning.

The third issue is the need to choose appropriate partners in order to learn. In Nepal few organisations were aware of or competent in SL. Amongst these organisations, there was a degree of unwillingness to share SL skills in an attempt to protect their part of the highly competitive development market. The remaining organisations were operating in the same highly political environment as IDS-Nepal. The progress of their programmes was slow and thus opportunities to share learning experiences were limited. Two feasible and appropriate opportunities existed for learning:

(i) explore beyond the national sphere for organisations with SL experience and/or training, an expensive option for Nepali organisations with few financial assets; and

(ii) expand beyond existing partners to those with SL experience and programmes. Developing relationships with additional partners was identified in section 5.5.3 as a process requiring long-term commitments.

The final issue above, risk and prioritising, relates to learning and change in practice for SL as a long-term investment for IDS-Nepal. Committing time and resources now in order to develop capacity in SL affects the survival, particularly with regards to the financial sustainability, of the organisation, and presents a risk to the ongoing primary tasks of the organisation.

Three options were identified by IDS-Nepal to reduce this risk against change in engineering practice with regard to financial sustainability:

- obtain long-term projects to reduce the necessity for work on proposals/concept papers;
- market an IDS-Nepal product or service, unrelated to its core activities; or
- attain larger projects with built-in overhead funds.

However, these options again require a sacrifice now in order to achieve long-term sustainability, a balancing act to be determined by IDS-Nepal.

Table 26: Comparing models with reality: learning about SL

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
1 – implement existing activities	Yes	See system for project implementation in section 5.3.1.		
2 – identify learning space	No			Learning space received very low organisational priority. Proposals and existing work were given high priority in the competitive environment.
3 – identify knowledge gaps	Yes	Workshops and training session.	Participants	IDS-Nepal assumed a greater understanding than what actually existed.
4 – identify students/ participants	Yes	Management Committee identified participants.	Staff availability and interest affected participation.	A narrow range of participants was identified. The learning programme relied heavily on the action research for momentum.
5 – identify SL resources within IDS-Nepal	Yes	Collated literature.	Participants identified relevant resources.	
6 – obtain external resources as required	Yes	Internet search, data collected from partners.	Participants identified relevant resources.	Insufficient time was given to identifying appropriate resources.
7 – identify scope, $$ and time commitment	No			Learning happened in an ad hoc manner, after higher priorities had been addressed.

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
8 – identify available training courses	Yes			Little ongoing review of opportunities was carried out. Fees, amongst other restrictions, limited attendance at courses.
9 – identify SL partners	Yes	Existing partners with SL experience.	IDS-Nepal identified partners.	Additional/international partners need to be explored. Some existing partners were less than willing to share knowledge/experience.
10 – develop learning programme with partners	Yes	Through concept papers and informal discussions.	Programme Manager	Greater advantage needed to be taken of existing relationships, however, priority for learning was not high.
11 – develop SL skills/knowledge	Yes	Learning primarily through reading.	Programme Manager	Low priority was given to learning. Only theoretical knowledge (versus practical skills) was being developed. Barriers to learning included perceived level of awareness of IDS-Nepal.
12 – extend SL knowledge to broader IDS-Nepal staff	No			No mechanisms for passing on knowledge.
13 – develop performance measures	Yes	Informal reviews.	Management Committee	Insufficient control regarding efficiency.

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
14 – monitor				
15 – take control				
16 – appreciate relevance of SL to IDS-Nepal's activities	Yes	Initial learning identified the role of SL in IDS-Nepal's activities.	Management Committee	Ability to implement SL was limited by additional external factors. It was believed that learning would meet the demand, should SL activities 'appear'.
17 – develop performance measures for effectiveness				
18 – monitor				
19 – take control				

5.7.2. Role of technology

Whilst IDS-Nepal did not identify it as a problem situation for the organisation, the role of technology in its activities has been demonstrated by previous systems to be contrary to the SL approach. The system to address this inconsistency is based on the analyses summarised in Box 6 and illustrated in the conceptual model of Figure 20.

Box 6 – defining the model for technology use

C: customers: rural communities

A: actors: IDS-Nepal

T: transformation: role of technology in community development activities changes

W: Weltanschauung: technology/infrastructure can reduce poverty

O: owners: IDS-Nepal

E: environmental constraints: approach of development sector

ROOT DEFINITION: An IDS-Nepal owned and operated system, in order to develop technology with the community to enhance livelihoods and reduce poverty.

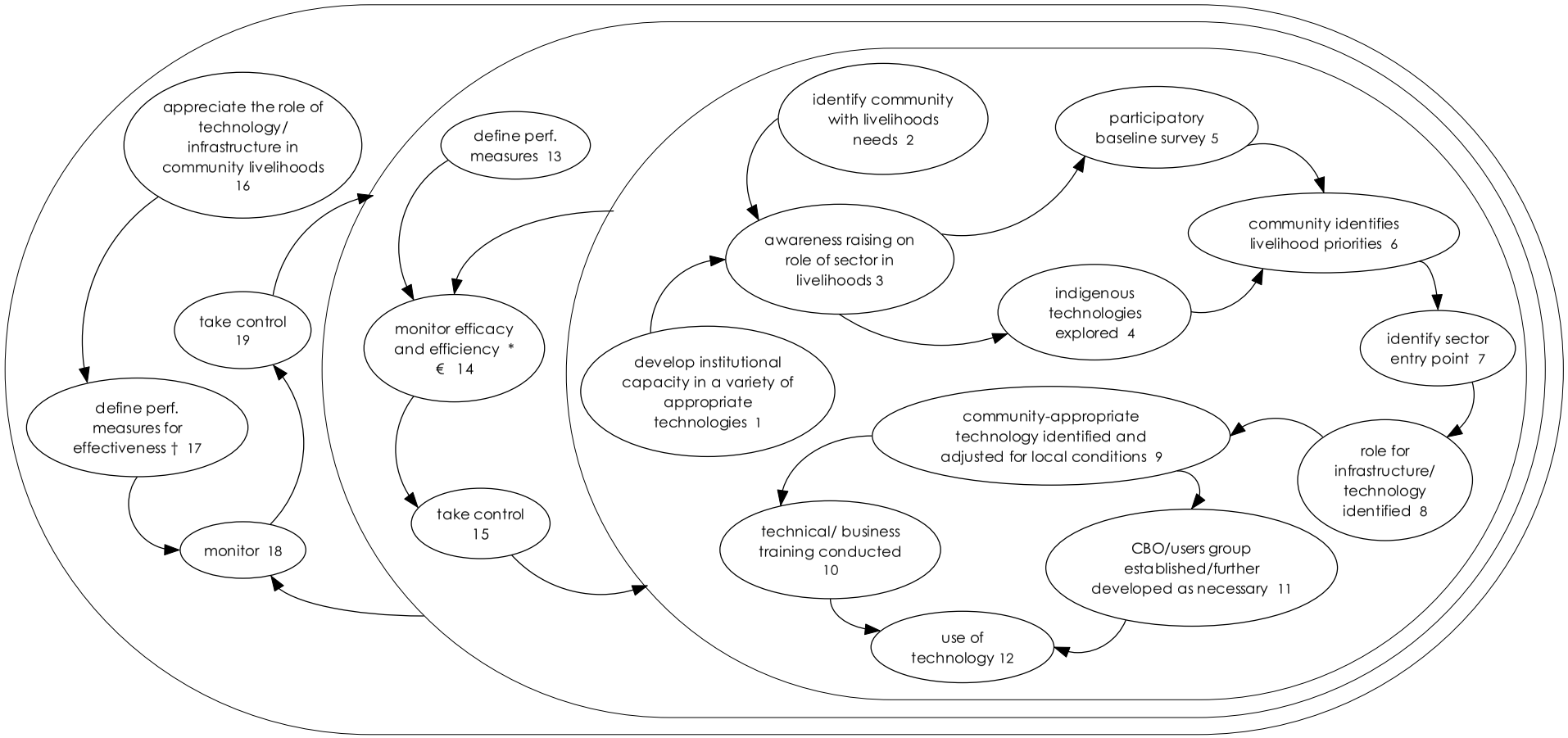
5.7.2.1.Changes: systemically desirable and culturally feasible

Through the comparison of the conceptual model and existing practice in Table 27 and the preceding analyses, the primary shortcomings identified in this system are listed below. These issues have also been identified throughout the previous five systems.

- top-down approach, including that controlling feasibility studies, need identification and prioritisation, identification and development of indigenous technologies and identification of entry points and training needs;
- communication and control of systems; and
- awareness of the SL approach and its methodologies, particularly participatory methodologies.

Whilst a large proportion of these issues can be affected by learning the appropriate methodologies and skills, it has been recognised that IDS-Nepal was limited largely by inadequate power and an inability to change due to the top-heavy power regime between donors and itself, which has been previously addressed in section 5.5.3.

Figure 20: Conceptual model of the role of technology in IDS-Nepal's activities



* efficacy: are we providing community-appropriate technology?
€ efficiency: are the time/$$ inputs worthwhile?
† effectiveness: are we enhancing the livelihoods of the rural community?

Table 27: Comparing models and reality: the role of technology in IDS-Nepal

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
1 – develop organisational capacity in a variety of 'appropriate technologies'	Yes	Based on field experience and research.	IDS-Nepal assessed feasibility	
2 – identify community with livelihood needs	Yes	Based on data collected from previous projects and additional research.		Focus was on infrastructure needs versus livelihood needs, contrary to the SL approach.
3 – awareness raising on role of sector in livelihoods	No			
4 – indigenous technologies explored	Yes	Through field experience.	IDS-Nepal	A top-down approach was used to identify local technologies in previous or parallel projects, however, technologies specific to the current project were not utilised.
5 – participatory baseline survey	No			Consultative participation was used. Crosschecks and verification were not carried out.

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
6 – community identifies livelihood priorities	No			Livelihoods were not considered.
7 – identify sector entry point	Yes	Identified at programme design stage.	IDS-Nepal	Community was not involved in process.
8 – role for infrastructure/technology identified	Yes			
9 – community-appropriate technology identified and adjusted for local conditions	No			Technology was defined at programme design stage.
10 – technical/business training conducted	Yes	Needs identified at programme design stage.	IDS-Nepal /donor	
11 – CBO/users group established/further developed as necessary	Yes	IDS-Nepal worked with existing groups where capacity existed.	IDS-Nepal	
12 – use of technology	Yes			
13 – monitor efficacy and efficiency	Refer to systems analysis in section 5.5.2.			
14 – take control				

Activity	Exist or not in real situation	How is it done?	How is it judged?	Comments
15 – appreciate the role of technology/ infrastructure in community livelihoods	No			IDS-Nepal's awareness of the role of livelihoods in poverty reduction was developing.
16 – define performance measures for effectiveness	Refer to systems analysis in section 5.5.2.			
17 – monitor				
18 – take control				

5.8.IDS-Nepal in practice

The previous systems analyses helped to define existing community development practice in IDS-Nepal and the potential and challenges for practice through the SL approach. The sections that follow detail two projects that were used to develop, define and analyse these previous systems. These projects are real examples from the practice of IDS-Nepal.

5.8.1. Example 1: Bishankanarayan beehive briquettes – acknowledging the need for participatory technology design

IDS-Nepal was awarded a Global Environment Facility (GEF) small grant to implement its Community Briquette Program in Bishankanarayan VDC, a village of the neighbouring Lalitpur district (as highlighted in Figure 9). The beehive fire briquettes were introduced as replacement fuel for wood for cooking and heating fires. The aims of the project, through the training of fire briquettes manufacturing and enterprise development, were (IDS-Nepal, 2003a):

- employment and income-generation within the community;
- reduced time and hardship for firewood collection, particularly for women;
- improved indoor air quality from utilisation of briquettes; and
- more sustainable use of local natural resource base, especially forest and vegetation cover, by the community.

Figure 21 illustrates the manufacture of the fire briquettes by a Bishankanarayan woman. The programme was initiated in July 2004, and intended to run for a twelve-month period through the following phases:

- community preparations and assessments;
- CBO establishment;
- marketing and promotion of the briquette;
- enterprise establishment;
- establishment of community livelihoods fund;
- enterprise start-up and trial period; and

Figure 21: The manufacture of beehive briquettes in Bishankanarayan VDC

- handover and monitoring.

Bishankanarayan was selected for the project based on previous data identifying sufficient natural resources, in particular, banmara, the weed used to construct the briquettes. Additionally, Bishankanarayan is linked to the external markets of Kathmandu by adequate roads. Further, the forest users group expressed a willingness to participate in the programme. A baseline survey for the bio-briquette project was not conducted; rather data from a previous project was used.

At the time of implementation, the community was using various sources of energy in combination. Firewood, kerosene, gas and electricity[16] were key sources.

The community eagerly adopted the briquettes. Domestically, the briquettes were used to maintain the body heat of chickens when raising them, instead of electricity. Their role in food preparation was less than predicted, as discussed below. The key use for the briquettes proved to be in the external market, where the community sold each briquette for 8 NRs. The Bishankanarayan

Figure 22: Using the beehive briquettes

[16] Kerosene cost 41 NRs per litre, which provided sufficient heat to boil 21 litres of water. In contrast, one briquette, at a cost of 8 NRs, was able to boil 7 litres of water.

community continued to use more traditional, and cheaper fuels, thus making a profit overall in fuel use.[17]

The use of the briquettes for cooking and domestic purposes was low, as the briquettes burnt too slowly for cooking needs in the morning. Additionally, the cooking stove was too high for warming their feet. Further comments made about the briquettes included the need for a wider variety of sizes and shapes to suit different cooking needs[18] and greater compaction methods.

As the bio-briquette technology was increasingly acknowledged and spread throughout Nepal[19] IDS-Nepal was aware of the different constituent materials apart from Banmara used in the briquettes and the different burning properties they may have. IDS-Nepal has urged that each community submit the individual type of briquettes for testing, to determine the effectiveness of the briquettes.

However, the absence of funding or resources has prevented IDS-Nepal from experimenting with different materials, shapes and methodologies for briquette construction, limiting the true potential of the briquettes from being achieved. This is just one example from the practice of IDS-Nepal reflecting the need for on-site experimentation by community users to be incorporated into technology projects throughout the design process.

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[17] The additional household income was used to buy food items, school fees and contributed to the community revolving fund.

[18] For example, a smaller briquette would be better suited to boiling a cup of water, and a larger briquette for cooking large quantities of food.

[19] The Forum for Sustainable Development produced a video on the bio-briquette technology, which was aired three times on national Nepal television. As a result of this, many organizations have asked for training. Additionally, in August 2005 GEF provided another US$40,000 to extend the program in three more villages.

5.8.2. Example 2: Nepalgunj water and sanitation – the emerging role of community expertise

IDS-Nepal's Sustainable Water and Sanitation Program, conducted in conjunction with Plan Nepal, had two aspects:

- the software component, including awareness raising, skill development, community empowerment for improved water and sanitation activities to improve health; and
- the hardware component, which consisted of the construction of school, family and public latrines, tubewells and incinerators and water-quality testing.

Figure 23: First phase latrine design

The provision of these components in the initial phase of the programme was developed around on a baseline survey provided by Plan Nepal. Target groups were identified and funding was provided by Plan's sponsorship programme. In this initial phase, the design was solely developed by Plan Nepal and IDS-Nepal, as illustrated in Figure 23.

Figure 24: Emerging community expertise in latrine design

Subsequent phases moved towards blanket coverage of tubewells and latrines, directed by demand from the community. Additionally, in these phases community expertise emerged, as the design of latrines in particular was developed in conjunction with community users. In particular, the first three feet of the latrines were Plan Nepal's traditional design. Above this, individual users contributed design suggestions and locally availably material, an example of which is illustrated in Figure 24. Based on previous programmes, Plan Nepal

predicted a demand of 3,000 latrines. In the early stages of project design, demand from the community had already far exceeded this. Whilst monitoring the acceptance and long-term use by the community has not been conducted, Plan Nepal and IDS-Nepal already felt that the project, with the community's emerging technical role and expertise increasing, was gaining wider acceptance.

5.9.The politico-development situation in Nepal

The political context directly affected the activities of IDS-Nepal and broader development activities in Nepal. The key elements of the political environment in Nepal throughout the research period (October 2003 to October 2004) were:

- political instability based on ongoing disagreement regarding national leadership between the Government, the royal family and Maoist forces (otherwise known as 'local government');
- instability manifested in city- and country-wide strikes, blockades and riots, affecting access to project areas and the design and implementation of projects;
- local government attacks on development agencies, restricting their movements and activities;
- local government and military attacks in rural communities, instilling fear and reducing their willingness to participate; and
- local government and military limitations and restrictions on community movement and activities.

5.10. External stakeholders

A brief background of a selection of stakeholders external to IDS-Nepal in the engineering/infrastructure community development sector helped to define the context for the transition to SL for IDS-Nepal. Whilst this data is not presumed to be representative of community-level infrastructure organisations, it provides a general context with regard to the implementation of projects with an SL approach for the case-study organisation in the particular context of Nepal.

5.10.1. SL in engineering at the policy-making/donor level

Interviews were conducted with MPPW and DFID.[20] The interviews are attached in Annex B. This data demonstrated two key factors for the implementation of engineering SL projects in Nepal:

- DFID, while being aware of SL and its methodologies, operated largely in a big budget, large-scale arena. Their programmes were largely inaccessible to grass-roots development organisations. A top-down management style was demonstrated at this level.
- At high-level policy-making, SL and its methodologies were not known, providing limited opportunities for the different methodologies and budgets of this approach.

5.10.2. SL at the INGO level in Nepal

In Nepal, INGOs work closely with government and directly affect policy. Interviews (as attached in Annex B) of two INGOs in Nepal, LFP and Intermediate Technology Development Group (ITDG) indicated some of the barriers to engineering and SL in Nepal:

- Whilst LFP was directly linked to HMGN through DFID, its practice was still limited by many barriers, including the political conflict. However, within the programme, which was conducted primarily through government staff, awareness of the approach and corresponding subsequent change in practice was slow. Without results from actual projects exemplifying the benefits of SL, acceptance by government staff was low.
- ITDG has a long history in Nepal, which was unusual in the environment of a proliferation of development agencies. This reflected well on their working modality, which was that of community-based technology, one of the key principles of SL.

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[20] In Nepal, major donors were able to directly influence government planning and policy-making, thus, they are considered as macro-level organizations.

5.10.3. SL at the community infrastructure level

Questionnaires were completed on 24 to 27 July 2004 by community-based organisations (CBOs). Follow-up interviews were conducted where possible to verify the accuracy of the data. A summary of the participants and the data collected is provided in Annex B.

5.10.3.1. Organisational status and livelihoods

A small minority (19%) of the organisations surveyed had been established for greater than fifteen years, as shown in Table 28, suggesting issues for long-term sustainability. The challenges for implementing community development programmes at the community level in Nepal were explored and summarised in Table 29. The greatest problems were a lack of funds (14 of 18 respondents) and the political conflict (nine of 18 respondents). Inadequate skills or a lack of appropriate partners were insignificant issues for the organisations surveyed (one and one of 18 respondents, respectively).

Table 28: Age of surveyed organisations (number of respondents)

Less than 10 years	Between 10 and 15 years	Greater than 15 years
14%	67%	19%

Table 29: Issues affecting organisational effectiveness (percentage of respondents)

Lack of funds	Political unrest	Lack of information	Improper management	Lack of time	Lack of partners	Inadequate skills
78%	50%	33%	17%	6%	6%	6%

Table 30 summarises the approaches used by the CBOs to win projects, the most common method being through the development of concept papers. Neither advertisements nor long-term partnerships were particularly successful for those organisations surveyed. Half of those organisations surveyed perceived the technical bid of a proposal to be the most important part of the bid, as summarised in Table 31. Financial bids were perceived to be the least important.

Table 30: Processes to develop projects (percentage of respondents)

Long-term partnerships	Advertisements	Concept papers
25%	25%	63%

Table 31: Criteria perceived as important by CBOs for judging project bids (percentage of respondents)

Staff	Technical	Financial	Other
25%	50%	13%	13%

Whilst many of the organisations attest to an awareness and use of the SL approach in their activities (75%), follow-up questioning and additional survey questions indicate little real awareness. The key crosscheck for this question was related to which model they used. Responses such as 'permaculture model' or their 'own model' indicated a poor awareness of the SL approach. Of the total respondents, 47% requested further SL training.

The multidisciplinary approach to activities required by SL is prevalent in the community-level development organisations surveyed, with only one of the 21 organisations surveyed operating in one sector only. Half of the remaining respondents operated in two or three sectors in their organisation, with the other half operating in more than three sectors. Table 32 summarises these results, focusing on six sectors. Other sectoral involvement of the respondents included women's empowerment, human rights, micro-finance, roads, income generation, irrigation, communications technology and rural energy.

Table 32: Sectoral involvement of CBOs (percentage of respondents)

Watsan	Education	Agriculture	Health	Forestry	Integrated	Other
95%	52%	33%	76%	24%	33%	38%

5.10.3.2. Micro-macro links

A key element of the SL approach is building partnerships to influence policy-makers throughout intervention activities. Of those CBOs surveyed, VDCs and DDCs were the primary partners, with 19 of the 20 respondents working at this level, as summarised in Table 33. CBOs rarely worked in conjunction with other NGOs (15% of respondents) or

government ministries (35% of respondents). Table 34 shows that participation by key partners was focused on the needs analysis (65% of respondents) and monitoring phases (55% of respondents). Only six of the 20 respondents incorporated key partners into the project design.

Table 33: Participation of key partners (percentage of respondents)

DDC/VDC	Other NGOs	Government	CBOs
95%	25%	35%	35%

Table 34: Role of key partners (percentage of respondents)

Needs analysis	Monitoring and evaluation	Project design	Labour	Cash contribution	Other
65%	55%	30%	15%	20%	5%

5.10.3.3. Dynamic

Monitoring and evaluation ensure that community development activities reflect the changing livelihood strategies and goals of the community over time. In the organisations surveyed, the donor was the primary agent (65% of respondents) for M&E, as shown in Table 35. The top priorities for M&E, as summarised in Table 36, included:

- community representation (62% of respondents);
- relevance to the community (53% of respondents);
- quality of construction (52% of respondents); and
- acceptance by the community and quantity of infrastructure (48% of respondents).

Table 35: Primary agent for monitoring and evaluation of community development activities (percentage of respondents)

Donor	Government	CBO/community	NGO	Other support agency
65%	35%	40%	50%	5%

Table 36: Object of monitoring and evaluation (percentage of respondents)

Community representation	Quality of construction	Quantity of infrastructure	Relevance to community	Acceptance by community	Other
62%	52%	48%	52%	48%	24%

5.10.3.4. Sustainability of interventions

The importance and implementation of the four dimensions of sustainability in the activities of the CBOs were explored.

Environmental

Table 37 illustrates the variety of methods used to assess the impact of community development activities, which was largely through community discussions (95%). Only three of the 21 respondents used external consultants or formal assessments (14%).

Table 37: Assessing environmental impact of community development (percentage of respondents)

Community discussion	Formal assessment	External consultant
95%	10%	5%

Financial

The organisations surveyed sought to ensure the financial sustainability of their community development activities largely through an operations and maintenance fund (nine of 20 respondents) and donor or project overhead funds (seven of 20 respondents), as summarised in Table 38. User-group-generated funds and CBO internal funds played a less important role in the sustainability of these activities with six and four out of 20 respondents, respectively.

Table 38: Approaches to achieving financial sustainability (proportion of respondents)

Project overhead funds	O&M funds	Donor funds	User-group-generated funds	CBO internal funds
35%	45%	35%	30%	20%

Institutional

Table 39 illustrates that managerial training of community-based organisations (CBOs) was the primary method (89% of respondents) of developing institutional sustainability for development activities. Technical (66% of respondents) and, to a smaller extent, financial training (50% of respondents) were also used. Training in software, empowerment of women, gender and sustainable development was also provided to the organisations of the respondents.

Table 39: Training provided to CBOs (proportion of respondents)

Managerial	Technical	Financial	Other
89%	67%	50%	22%

Social

A key focus of the SL approach is incorporating the community into development activities to maximise social equity and minimise social differentiation. In those organisations surveyed, it was primarily the user group through group discussion (81% of respondents) that selected participants from the community, as illustrated in Table 40 and Table 41. Only a small minority included a minority group quota allocation (14% of respondents) or included all households (24% of all respondents) to ensure participation by those most vulnerable.

Table 42 shows that participation of community users was largely at the needs analysis phase (75% of respondents), monitoring and evaluation, project design (60% of respondents each) and through a cash contribution and labour (60% of respondents). Participation in infrastructure design was the least-common activity (45% of respondents) for the community.

Table 40: Selection process for community participation (percentage of respondents)

Community	User group members	Community leaders	Donor	NGO
52%	71%	14%	5%	10%

Table 41: Procedure for selection of community participants (percentage of respondents)

Group discussion	Minority group quota allocation	All households	Random sample	Voting	Other
81%	14%	24%	14%	14%	5%

Table 42: Involvement of community in the project cycle (percentage of respondents)

Needs analysis	Cash	Labour	Monitoring and evaluation	Infrastructure design	Project design
75%	60%	60%	60%	40%	60%

5.10.3.5. Participatory approaches

The largest proportion (61% of responses) of community-level organisations used less than three participatory tools. Whilst 22% of responses showed usage of between four and six tools, only 17% showed an excellent approach to participation with more than five tools, including interviews, seasonal calendars, SARAR[21], community maps, transect walks, focus groups and mass meetings.

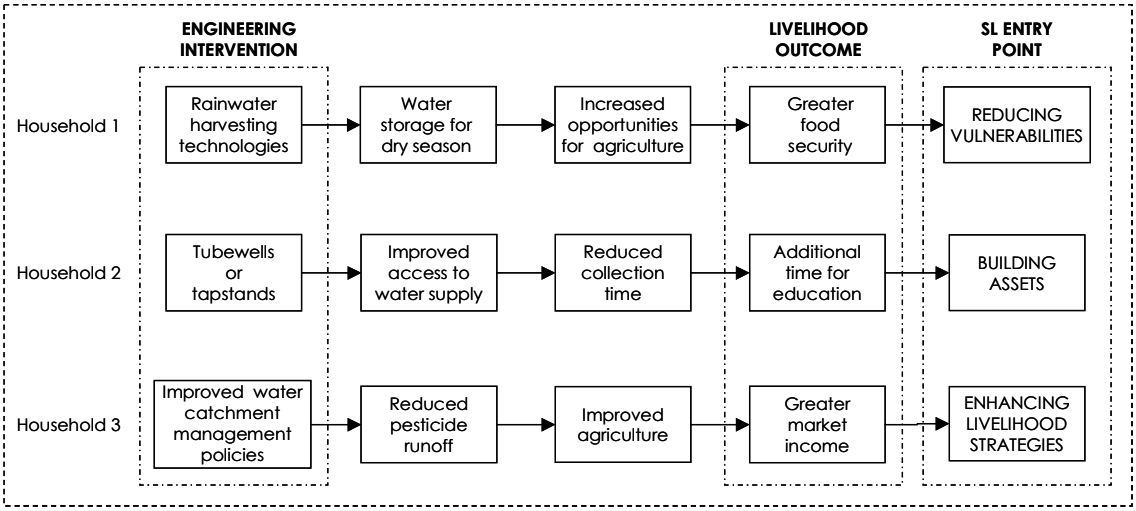
[21] SARAR is a participatory approach to training. The name is an acronym of five key attributes of a successful participatory approach: self-esteem, associative strength, resourcefulness, action planning and responsibility (World Bank, 2003b).

CHAPTER 6. DISCUSSION

6.1.Characterising engineering and sustainable livelihoods

An engineering non-government organisation (ENGO) has several entry points when delivering community development interventions through the SL approach. For example, an ENGO may address different household priorities in the one community in a water-sector programme, as illustrated in Figure 25. This shows a variety of interventions, both technical and at the policy-level, implemented in combination to affect an array of SL elements (such as reducing vulnerabilities, building assets, enhancing livelihood strategies and affecting policy) in the overall community. This portfolio of interventions addresses a variety of livelihood goals of the community.

Figure 25: Sustainable livelihoods with a water-sector entry point



The multiplicity of entry points and interventions in the example above illustrate the diversity in SL practice for an ENGO. It shows the complexity of priorities in a community and the correspondingly great complexity of interventions. Such intricacy presents challenges for ENGOs implementing through SL.

The case study of a grassroots ENGO in Nepal explored these challenges. It progressively identified seven core areas affecting practice for the adoption of the SL approach in its activities. These were affecting the mission statement of the organisation; adopting sustainable livelihoods; enhancing community participation; implementing monitoring and evaluation schemes; developing partnerships; the role of learning; and the role of technology. From these seven systems challenges to practice emerged, which are grouped into three groups:

(i) challenges to non-sector-specific NGOs adopting a new participatory community development approach – these included learning, power, control and partnerships, risk and survival and commitment from the key proponents. These have been detailed throughout the organisational change and community development literature (DiBella, 1992; Fitzgerald, 1999; Pasteur and Scott-Villiers, 2004).

(ii) challenges to non-sector-specific NGOs adopting the SL approach – key SL literature reinforces the challenges of the case study, including monitoring and evaluation, multidisciplinary programming and scheduling (DFID, 2001b).

(iii) challenges for an ENGO adopting the SL approach – five modifications necessary to engineering practice have evolved from the case study: technology and the discrepancies between the specifications of appropriate technology and those for technology for sustainable livelihoods; the process for developing technology relevant to SL; the regulatory frameworks affecting this process; engineering culture including the role of the engineer as the 'expert' and the subsequent power balance; and engineering education.

This final group of challenges in particular, constitutes the original contribution of this research. These are explored further in section 6.2. The implications for future SL practice in community development for both the ENGO of the case study and the supporting frameworks are also explored. Finally, a discussion of the relevance of appropriate technology for SL and the role of SL in engineering community development practices is provided.

6.2. Challenges for sustainable livelihoods and engineering

6.2.1. Technology specification

The SL approach to community development promotes, through its focus on people and participation, local development of interventions at the community user[22] level. Much of

[22] Community user is employed to differentiate between users at the local level in LDCs and commercial users in developed countries.

the literature for participatory community development approaches[23] promotes technology transfer (WFEO, 2000a; ITDG, 2002; Wakeford, 2004), an approach which provides technology designed and developed by an external source. This approach tends to promote the high end of the technology scale. This fails to meet, however, the primary focuses of the SL approach, particularly the people focus.

An alternative to technology transfer is appropriate technology, which has been promoted by many practitioners to address the objectives of SL (Barton, 2001a; Bates, 2001; De Silva, 2001). The absence of large-scale acceptance of appropriate technology suggests inadequacies in the approach. The relevance of appropriate technology to SL is explored by revisiting its characteristics, as defined in section 2.3.3.3. Technology defined as 'appropriate technology':

(i) is labour intensive, to create as many jobs as possible: critics of appropriate technology argue strongly against the premise on which this statement is built (Emmanuel, 1982). A labour-intensive technology may conflict with the existing daily livelihood strategies of the community user and perpetuate the poverty in which the user lives. Such technology may be appropriate only to a community in which a large proportion of households have an overall livelihood strategy based on household incomes.

(ii) reflects scales of local economies: this corresponds with the SL concepts of financial sustainability and building the assets of the community user. Emmanuel (1982) and leapfrog technology proponents query technology developed on a local scale in many community development projects, noting that technology for poor people is poor technology and serves only to perpetuate poverty. However, technology reflective of local economies allows for growth and development of technology as the capacity of the community user(s) expands. Technology thus needs to be reflective of the opportunities for growth, as acknowledged by the Sustainable Livelihoods Unit (1999).

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[23] As noted previously, SL uses participatory approaches, and is, therefore, often grouped with them. Additional methodologies, as detailed in section 2.6, differentiate SL from more generic participatory approaches.

(iii) improves income: this contrasts with the view of SL proponents that increasing income is but one of a range of possible livelihood strategies of community users. Further, technology practice of SL does not aim to merely affect livelihood strategies but can be used to affect vulnerabilities, build assets or influence local or national policies, process and institutions.

(iv) uses scarce capital wisely and meets the needs of both men and women: for both social equity and equality and environmental sustainability as endorsed by SL the appropriate and wise use of technology is vital.

(v) is simple to run and repair and uses locally produced materials and equipment: as discussed in (ii), the nature of skills, material and equipment promoted by technology for SL should reflect the changing capabilities and opportunities of the community user.

(vi) hygienic, non-polluting and using renewable sources of energy: critics and proponents of appropriate technology and proponents of SL alike agree on this aspect of technology (Emmanuel, 1982; Schumacher, 1993; Sustainable Livelihoods Unit 1999). Technology for SL aims to avoid the mistakes of the technology of developed countries to ensure environmental sustainability, which in turn impacts upon possible income-generating activities, health impacts and more.

Thus, while proponents of appropriate technology and SL agree on many of the characteristics of technology for community development, appropriate technology falls short in its ability to complement the intended users in the community, particularly with reference to their *changing* livelihood activities and personal and financial capacities. So for SL, therefore, appropriate technology becomes relevant when it is able to reflect and adapt to its intended user. Thus technology moves from largely technical and economic definitions, to incorporate human and biological spheres, a characteristic identified by a growing group of technologists (Sustainable Livelihoods Unit 1999; Amadei, 2003).

6.2.2. Participatory design of technology

Participatory methodologies are widely acknowledged as a suitable approach to overcome the well-documented shortcomings of community development activities (Thomas, 2002; Kumar, 2003). The challenges and opportunities for implementation

through such methodologies have been noted throughout the literature (Rennie and Singh, 1995; Karl et al., 2002). The importance of these methodologies in the SL approach is also highlighted in section 2.6.

However, the current methodologies for technology design have failed the SL approach. Typically, ENGOs have simply provided users with access to technology, consulting the user only after a large financial and time investment to its investment has been made (Wakeford, 2004). This approach was also demonstrated by the ENGO of the case study and the external stakeholders in the research. Participation by community users during the technology design process in these examples has been low. The lack of guidelines or case studies for participation in this phase of the engineering community development cycle further reinforces its low priority in SL.[24] Furthermore, it has been noted that the success of this phase, in particular, has been low, and technology has typically failed to address the needs of its intended users (Clarke and Wallsten, 2002; DFID, 2004b). Redefining technology for SL, as discussed in section 6.2.1, locates people at the centre of the design, to ensure their ability to adjust technology to suit their needs. In this way, control of the technology is by the community user, as opposed to technology controlling the community user (UNESCO, 2003). The design process, therefore, must reflect this people focus.

Participatory methodologies are therefore promoted not only by the social scientists and economists who originally formulated the sustainable livelihoods approach, but also by engineers. Social scientists and engineers alike agree that participatory approaches to design promote community technologies and knowledge, ensuring their relevance and subsequent effectiveness during implementation and use (Sustainable Livelihoods Unit, 1999; Stanford University, 2003).

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[24] The SL approach focuses its participatory methodologies on poverty assessment, analysis, planning, mobilising, implementing, training, monitoring and evaluation, as highlighted by a key SL definition of these methodologies:

> *used to encourage people's participation in the processes of identifying/analyzing livelihood opportunities and problems, setting priorities and planning, implementing solutions, and monitoring and evaluating changes and impacts* (DFID, 2001b).

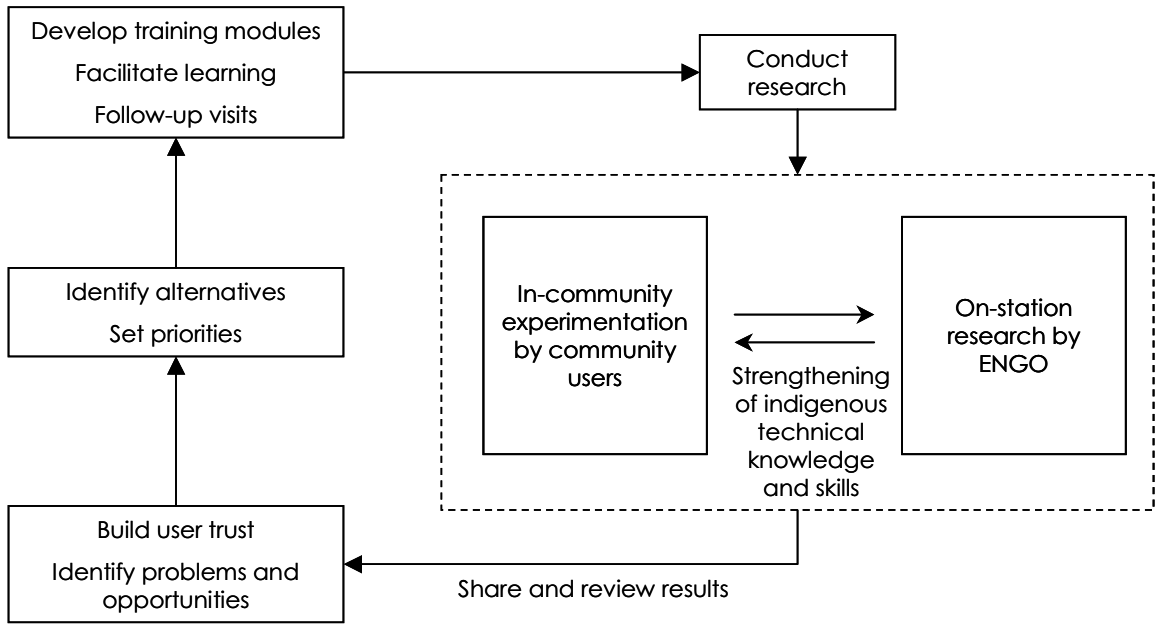
Participatory technology design has typically been the domain of agriculturalists, using farmers' research groups to experiment with technologies for soil fertility, soil and water conservation, cropping systems, livestock extension and more (Horne and Stur, 1999; IIRR, 2000).[25] These methodologies, however, can also be used to suit the process needs of ENGOs for use with the SL approach.

An initial model for participatory technology design bases its effectiveness on a cycle of action and reflective learning, as illustrated in Figure 26. In this cycle, community users' groups develop and test technologies through experimentation, prototypes and pilot testing, both 'on-site' in the proposed community environment and in conjunction with the ENGO at the research site. Tools such as natural and social timelines and cycles, land-use history, participatory technology analysis and design and exchange workshops are amongst the methodologies used in participatory technology design (Vernooy et al., 2004).[26] These methodologies help to recognise the social, political and cultural nature of livelihoods, and the roles that new technologies may fill in these environments.

[25] Participatory technology design is also growing increasingly popular in the commercial world in computing sectors (Moffatt, 2001; Stanford University, 2003).

[26] Stepwise descriptions of methodologies for participatory technology development are provided by Sutherland, Martin and Salmon (1998), Horne and Stur (1999), Nabi, Datta and Alim (2000) and IIRR (2000).

Figure 26: Participatory technology design cycle



(adapted from IIRR, 2000; Nabi et al., 2000)

A key strength of a participatory technology design approach is the interaction between the technologies and knowledge of the ENGO and those of local communities. Geographical isolation of community users from sources of technical innovation can limit the scope of local skills. Technology design through participatory processes becomes a combination of indigenous technical knowledge and outside scientific knowledge where both the community user and the ENGO develop skills for further innovation to enable the future adaptation of the technology to suit the community user (Sustainable Livelihoods Unit 1999). This helps to avoid the limitations of poor technology as described by Emmanuel (1982). This process, contrasting with the *technology* transfer approaches typical to traditional practice in ENGOs, is a *capacity* transfer (Anstiss, 2002), which corresponds with the empowering approach of SL. In this participatory process the ENGO loses its less-than-desirable role as the 'expert' and gains strength as a learning facilitator. With joint innovation between the community user and the ENGO, technology unique to the specific social, political and environmental contexts is developed.

Problems with participation in the technology design phase imitate those detailed throughout more general participatory literature and experienced by the ENGO of the

case study, including greater time and financial requirements; conflict in interest for community users between traditional subsistence activities and technology design activities; maintaining equity for access to the process based on issues such as literacy or geography; and power relations (Chambers, 1994; Sutherland et al., 1998; Wakeford, 2004).

Further, technology developed through such processes is less likely to be replicated or comparable in other communities, with implications for standardisation, as discussed further in section 6.2.2.1.

6.2.2.1.Standards and policy for technology for sustainable livelihoods

The objectives of standards for engineering community development have been explored in section 2.3.3.3. Key development and enforcing bodies assert their importance in the social and economic environments of the commercial world.

The strength of standards development and enforcement relies on the replication of technology and processes to allow for comparison across domestic and international markets (DFID, 1998). The support of international standards and the associated compliance and development bodies provides a reservoir of technical knowledge to:

> *avoid the waste of resources by 'reinventing the wheel' and to transfer state of the art technological know-how* (ISO, 2004a).

This, however, contrasts directly with the nature of unique and community-specific technologies, as discussed in section 6.2.1. So whilst ISO acknowledges the impact of inappropriate technology imports and the challenges by LDCs to enter international markets, the flexibility and unique nature of technology promoted by SL needs to be addressed by standards designed to manage these issues. Access to the standards working committees and the ability to influence the nature of standards is the key to ensuring that international standards assist technology development for SL, not hinder it (ISO, 2004a). ISO promotes such access through its Action Plan.[27]

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[27] The fifth objective of ISO for developing countries is to:

> *increase participation in governance and technical work of ISO to voice priorities, contribute and influence the technical content of ISO deliverables.*

National policies on the import of foreign technologies and marketing support for domestically produced technologies can be just as supportive or equally as great hindrances as international standards.

Thus, participation in DEVCO CAG[28] and national policy-making bodies by key technical proponents of SL to influence the nature of standards is possible and necessary for appropriate support to technology for SL.

6.2.3. Engineering culture

6.2.3.1.Engineering expertise

A key to the success of participatory technology design for SL is the empowerment of the community users in order that they participate fully in these processes. The inability of ENGOs to effectively empower community users has been identified in the case study and is reflected in the literature on community participation (White, 1996; Cornwall, 2002). For the ENGO of the case study and throughout the literature, it was the role of the engineer as the 'expert' that enforced the top-heavy power relationship between ENGO and the community, perpetuating low success of community empowerment and subsequent inadequate participation (Stanford University, 2003; Harvey et al., 2002).[29]

The 'expert' engineer with considered expertise and skills attributes little knowledge or few skills to the community, and leads the idealised participatory process of SL in a top-down, disempowering manner. The top-down process of the ENGO defining technology and its specifications it is a manifestation of the role of the 'expert', perpetuating the power imbalance. Top-down communication and technical jargon add further to the mystique of the expert and their processes.

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[28] DEVCO CAG consists of nine members. Two thirds of these are from LDCs with the remaining one third from developed countries (ISO, 2004a).

[29] Donor-led budgets and time schedules also restricted the practice of participatory methods, which are readily accepted to be messier, take longer and subsequently cost more than top-down approaches. These problems, however, are common to community development agencies, not just ENGOs and are therefore not discussed further.

A discussion of the causes of this ‘expert’ engineer focuses on the systems that educate and support the engineer. This section explores the supporting regulatory and legal frameworks while section 6.2.3.2 explores the education systems.

The engineer is guided strongly by legal and regulatory frameworks that dictate that the engineer accepts responsibility for their designs. Many of the engineering Codes of Ethics promote attaining a high level of competence, upward accountability, diligence and personal responsibility (British Engineers, year unknown; Professional Engineers Ontario, year unknown; Engineers Australia, 2000; WFEO, 2000b). Legal frameworks then detail the corresponding compliance, liability and negligence issues for engineers (Engineers Australia, 2002). The engineer is required to have sufficient expertise to avoid legal and professional castigation. The role of the ‘expert’ thus emerges, with the engineers idealising their technical knowledge and skills and valuing those of the community users far less. Such power relations contrast strongly with those conducive to SL.

The skills and knowledge of the community users thus become key to the collective community expertise. In their own communities, ‘local engineers’ have extensive knowledge of the local environment and available materials. Their skills are those that will maintain and operate community technology beyond the scope and presence of the community development engineer. Thus, local technicians have great value as local ‘experts’ and engineers, from whom to learn. In this context, the ENGO provides support and guidance to local engineers and ‘experts’, who have equal power and control of the process. Its own role as key expert gives way to that as facilitator and teacher. Accountability of the ENGO to the community user for the process must also be addressed, to encourage these power relations. A change of attitude by the ENGO corresponding with changes in regulatory and legislative frameworks must occur in order that diligence and personal responsibility no longer rests solely with the professional engineer.

6.2.3.2.Engineering education

The case study of the ENGO and key SL guidelines has identified the need for multidisciplinary approaches and teams to design and implement community development activities (DFID, 2001b). For an ENGO, however, the ability to work effectively through multidisciplinary approaches is affected by the skills of the engineer,

which have been developed through their education and experience with sector-specific teams.[30]

In education systems, aimed originally for engineers to design for the rich, the engineer is taught how to control the non-natural and natural worlds (Amadei, 2003). Engineering education focuses purely on the technical and business skills of each individual sector.[31] The process of technology design is isolated from other stakeholders and other sectors. More recently developed education programmes are focusing on practice in LDCs, such as the Environmental Engineering for Developing Communities course at University of Colorado (Civil Environmental and Architectural Engineering Department, 2004) and in the International Technologies Centre of the University of Melbourne (Department of Civil & Environmental Engineering, 2004). These programmes, however, still focus largely on technology, with little attention given to people management. The social, cultural and legislative aspects of community development *are* being addressed in non-technical programmes such as Victoria University's International Community Development specialisation (Wakeford, 2004) or through the Institute of Development Studies at the University of Sussex (IDS, 2001). However, there is little overlap between the technically focused programmes for engineers and the non-technical programmes for managers.

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[30] Developing skills through experience in cross-sector teams will occur as the community development sector itself adopts such approaches.

[31] Tribhuvan University, one of the leading technical universities of Nepal, has an extensive Institute of Engineering. A range of traditional engineering courses includes Civil, Electrical, Mechanical, Agricultural, Computer, Structural, Environmental, Renewable Energy, Information and Communication, Power System and Geotechnical Engineering (Tribhuvan University, 2004), illustrating the sectoral focus of engineering education. In Australia, similar courses are conducted, focusing largely on technical subjects. Of the 59 subjects offered over four years in an environmental undergraduate engineering degree, just nine subjects are non-technical, those being Engineering Management and Environmental Engineering Practice.

6.3.Implications for engineering

The previous discussions have highlighted key elements for practice in engineering organisations, particularly ENGOs, for community development through the SL approach. These discussions were developed from lessons learned from the case study of an ENGO in Nepal. From these discussions and lessons learned, suggestions are made to enhance the practice of both ENGOs and their support organisations. The implications for the ENGO of the case study are explored specifically and those for engineering organisations in general, separately.

6.3.1. Lessons for IDS-Nepal

The case study of IDS-Nepal aimed to highlight opportunities and limitations for its engineering practice through SL. Whilst many of these were not specific to an engineering NGO, they were essential to providing organisational stability and building the processes and institutions to allow practice for SL.[32] These are explored briefly below.

6.3.1.1.Learning practices

IDS-Nepal was aiming to develop SL expertise through two key means:

(i) formal external training; and

(ii) on-the-job training with partners with greater experience.

These approaches were affected by a number of issues, including a lack of access to appropriate learning resources (including partners and SL projects) and the risk of expending time and resources on a change in approach. Chambers (1993) recognises these barriers to learning and notes that the most effective project environment for learning is one with:

- available funds;
- no pressure to spend a fixed capital budget;

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[32] IDS-Nepal's history in community development in Nepal is short, and its history in SL even shorter. As such, the limitations and opportunities experienced were associated to a greater extent with developing a niche for the organization in the community development market.

- no targets for physical achievements;
- no need to achieve visible versus invisible; and
- adaptive rapid appraisal of activities.

Such an environment, however, was not available in the donor-led projects typical of IDS-Nepal's workload. Partnerships with organisations with SL experience were also difficult to develop in Nepal, with few organisations visibly working through SL.[33] Those organisations that were working through SL were largely inaccessible to IDS-Nepal. Until effective partnerships can be developed in which IDS-Nepal can influence programme design at an earlier phase, then such a project environment is unlikely.

Additionally, barriers such as the perceived pre-existing knowledge of the research participants, perceived roles of expertise and a lack of SL activities to implement further reduced the pressure to learn.

At the INGO level, exemplified by the surveys of the external stakeholders, as for IDS-Nepal, there was a need for practical learning experiences. This is an important issue for key proponents of the SL as discussed further in section 6.3.1.4.

6.3.1.2.Power, control and partnerships

Ineffective power relationships were noted between IDS-Nepal and the donor or policy-maker and between IDS-Nepal and the community user.

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[33] This low presence or awareness of sustainable livelihoods approach in infrastructure was reflected in the water and sanitation sector in South Asia. The researcher attended the Third South Asia Water Forum (SAWAF III) in Dhaka, Bangladesh in July 2004. The first indicator was that the researcher's paper "Moving towards Sustainable Livelihoods Approach for Poverty Reduction in Water and Sanitation Programmes in Nepal" (Salvestrin et al., 2004) was slotted *not* into the Water Poverty and Livelihoods session, but into the very technical Water Supply and Sanitation session. Additionally, after the presentation of the paper, the co-chair of the session summarised the presentation by commenting on technical engineering details and micro-finance! He made no mention of livelihoods, participation or even the community. And there certainly had not been any detail about micro-finance in the presentation.

In the majority of the systems examined in Chapter 5, the donor or policy-makers were identified as the major system owners, or major environmental constraints, due largely to their funding role. The power imbalance affected the systems of IDS-Nepal both directly and indirectly for:

- obtaining financial support;
- defining project/programme scope;
- developing community-focused work schedules and budgets;
- building partnerships at the macro-level;
- building rapport and partnerships with the rural community;
- building community-responsive programmes; and
- effective monitoring and evaluation, internal and project-based.

Whilst IDS-Nepal had all the responsibility and commitment to change the system and practice, the external force of the donor/policy-maker limited its ability to do so. In a community development context where most projects are defined by donors or the government, which prefer short-term projects with measurable outputs, this external force against changes in practice is notable.

In order to address these differentials of power and control, it is important for IDS-Nepal to develop partnerships with donors with similar cultures where awareness of SL and its benefits is greater. Cultures with equivalent scheduling, budgeting and participatory methodologies will be more conducive to equality in relationships. However, in the reality of Nepal, with just a small number of key donors visibly practising SL, such partnerships are difficult. Whilst a greater number are implementing livelihoods-based projects[34], the larger budgets and extended timeframes for a SL-based project are poorly regarded.

A key issue for IDS-Nepal is therefore to move away from the funding and internal-control-type partnerships, as described by Franks (2004), between the donor and IDS-Nepal. Supportive/enabling partnerships will pass some, if not all control over to the

[34] Sixteen agencies, including UN organisations, I/NGOs and international financial institutions, are conducting livelihoods programmes in 73 of the 75 districts.

activities of IDS-Nepal, which in turn, helps also to empower community members. Chambers (1993) notes that continued lobbying, activism and advocacy of desired partners are effective to raise awareness of the SL approach in order to develop such partnerships. Two-way reporting between organisations can also help to build awareness and relationships. However, in an environment where existing organisations have little commitment to the SL approach, awareness-raising is a long-term commitment for IDS-Nepal.

Just as significant were the subsequent power and control differentials between the NGO and community members. IDS-Nepal dominated much of the definition of the scope and scheduling of activities and participation was rarely reflective of the true abilities and needs of community members, as discussed in sections 6.2.2 and 6.2.3.1. In turn, the community members contributed very little to the project, with its input focused largely on the provision of labour and cash during construction phases. For the community, a greater commitment to addressing the real goals and strategies of the community is needed to build trust and rapport. Delivering tangible outcomes at all stages of community development activities can further enhance this.

6.3.1.3.Risk and survival

In the transition from traditional engineering community development practice to that for SL IDS-Nepal was exposed to several risks, based on the following:

- the relative youth of the organisation, which affected its profile in the community development sector of Nepal and the ease of obtaining projects;
- the competitive nature of the Nepali development sector, which again limited the number and variety of jobs available to IDS-Nepal;
- limited organisational overhead funds, which limited the number of non-project-related hours available for developing the awareness and skills for new approaches; and
- the ongoing political conflict, which affected the number and distribution of development projects.

These issues created an environment for IDS-Nepal in which committing time and resources to building SL capacity detracted from the ongoing activities necessary for the survival of the organisation. Change and learning were long-term investments for IDS-

Nepal without identifiable short-term gains, earning low priority amongst existing activities and those necessary for survival. The systems for adopting the SL approach were therefore given priority only when those survival tasks, such as proposal preparation and project work, were completed.

The SL approach was further poorly prioritised through the identification of participants for the research. From an organisation with a greater proportion of males, mostly in the roles of engineers, two female staff were committed to the research by the Chairman. When the researcher attempted to adjust this balance, it was evident that the male engineers had greater priorities than the adoption of SL.

Where practice for SL contrasts so greatly with current approaches to community development, the need for a change in practice is high. The case study of IDS-Nepal has illustrated that in the risky political and social environments of Nepal, greater commitment to organisational change must be made.

The data from the surveys of the external stakeholders reflected the importance of risk and survival for the transition in community development approaches. The CBOs faced similar challenges to survival. The latter two issues identified in the case study, that is, lack of funds and the political conflict were the greatest barriers for the CBOs. However, for the INGO with comparatively unconditional and unlimited financial support and programme flexibility, the risks of adopting the new SL practices were significantly reduced. Even where there were unfavourable conditions in the organisation to the adoption of SL[35], time and resources continued to be provided to promote skills and practice. This indicates that organisational strength is a key factor to enhancing the ability to adopt new practices in the not-for-profit environment of the case study.

6.3.1.4.External commitment to SL

In the community development sector, donors and partners (or recipients) are interdependent. The survival of one organisation depends on the survival of the other organisation. The case study identified a role for the major SL advocates in assisting smaller organisations to ensure their survival through the implementation of SL.

[35] In the organization reviewed, low staff commitment to SL created barriers to its adoption.

Promotion of SL alone is insufficient to ensure its implementation or survival in the sector. The following aspects need the support of the major advocates:

- to make training available both financially and geographically;
- to provide opportunities for organisations to develop practical skills;
- to allow for longer schedules and bigger budgets in project planning; and
- to develop smaller, less output-oriented programmes for practical learning experiences.

6.3.2. Implications for engineering non-government organisations

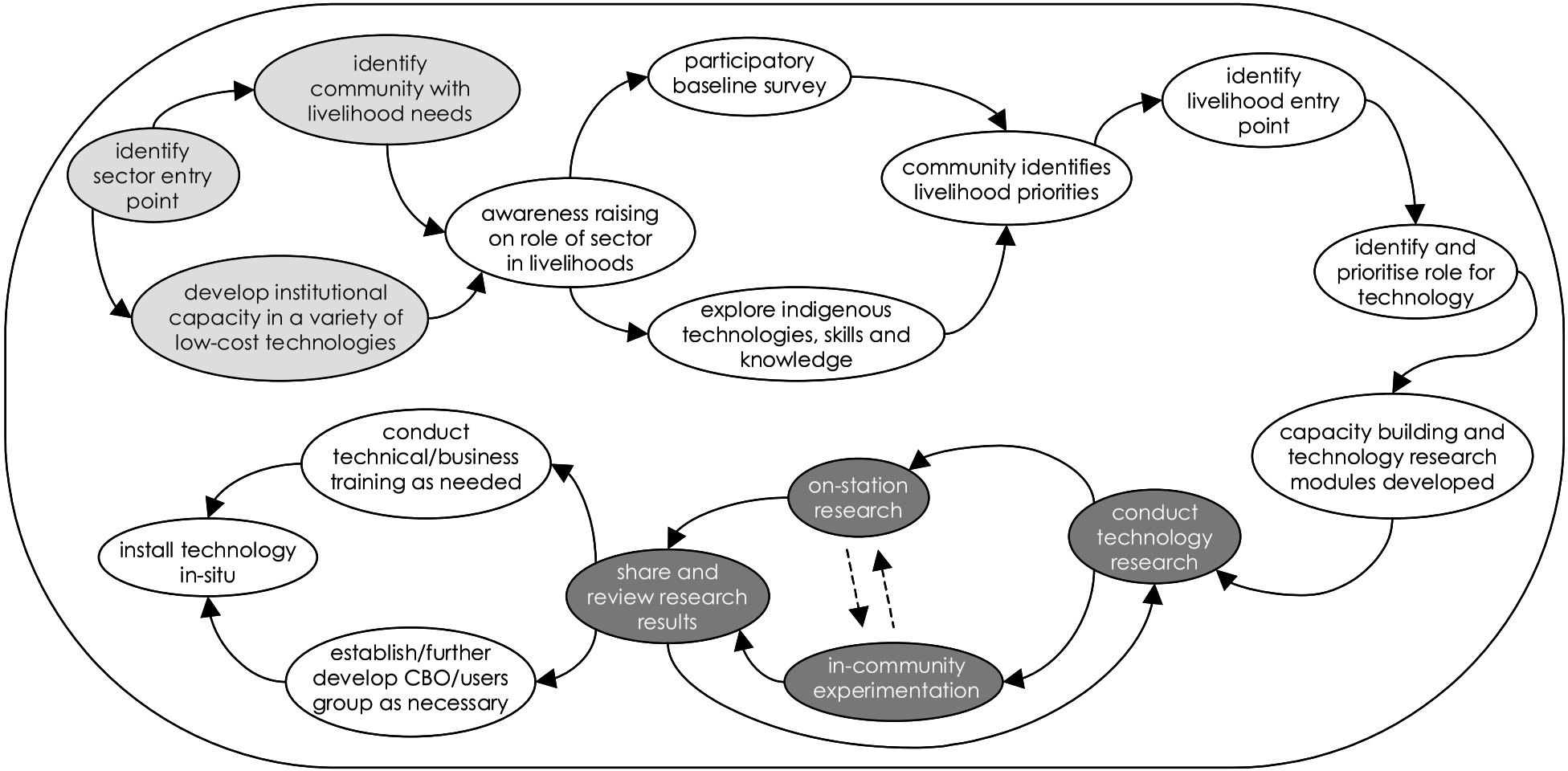
This section summarises the opportunities for ENGOs to develop their practice for SL, focusing on technology as the key differentiation between ENGOs and more general community development NGOs. This discussion is based on the system for technology for community development from the original conceptual model in Figure 20, updated to address the discussions in section 6.2.

The key opportunity for engineering practice through SL is the adoption of the process of participatory technology design. This process is represented by the tasks in white text in the core[36] of the updated model in Figure 27. The adoption of this process, and the subsequent changes in the technology output is supported through the change in role of the expert between the ENGO and the community users.

It is interesting to note that, in Figure 27, only the three early grey tasks are conducted by the ENGO in isolation. The remaining tasks are implemented in conjunction with the community users, highlighting the people focus. Additionally, there is less focus on technical/business training and establishment of enterprise organisations, due to the acknowledgement that technology is used not merely to generate incomes, but may affect the asset base, reduce vulnerabilities or affect policy.

[36] The monitoring and evaluation tasks of Figure 20 have been excluded for ease of presentation, but continual review of this system is vital to the success of the participatory technology design process.

Figure 27: Improved model of ENGO tasks for SL-driven project



6.3.3. Implications for engineering support agencies

The research has acknowledged that ENGOs cannot implement community development activities in isolation. They are part of a diverse group of community development agencies including government, donors, policy-makers and educators. The discussions in section 6.2 have identified important roles for many of these organisations in the support of ENGOs:

(i) standardisation organisations/policy-makers: collaborate closely with ENGOs from LDCs to ensure that international standards and national policies do not inhibit the development of technologies unique to individual community users. Ensure that standards and policies prevent infiltration of international or cheap substitutes for locally designed and relevant technologies.

(ii) regulatory/licensing organisations: acknowledge the declining role of the personal responsibility of the engineer and upward responsibility of community development organisations in legislations and Codes of Practice. Develop policies and legislation to encourage downward responsibility to the community user.

(iii) educators: build education programmes for engineers with social, cultural and political focuses. In particular, participatory methodologies can help to ensure the inclusion of these elements into technology for SL.

The necessary commitment of donors has been discussed in section 6.3.1.4.

6.4. The misuse of appropriate technology

The philosophy of appropriate technology was initiated more than thirty years ago to address the basic needs of people in LDCs, whilst making the most of their resources, skills, time and capabilities (ITDG, 2005b).

As discussed in section 6.2.1, many practitioners also promote appropriate technology to address the objectives of SL. The previous analyses and discussions have, however, identified a disparity between the specification and design process of appropriate technology and its adequacy in meeting these objectives. A need was identified for technology to focus more on the intended users and their existing livelihood activities, and to be flexible enough to change with the changing circumstances of the users. Section 6.2.2 subsequently noted that these adaptations to the nature of appropriate

technology would benefit from an approach of participatory technology design. These discussions have revealed that while the specification of technology for the appropriate technology movement has changed, largely from high technology to low technology, to meet the needs of the community, the process for achieving this has not changed. The advocates of leapfrog technology further reinforce that low technology is not necessarily the key to community development.[37] ITDG, a key advocate of appropriate technology acknowledges the failure of appropriate technology is due to this ignorance of other-than-technical details (Coupe, 2001). The traditional engineering approach to technology design, of a top-down, disempowering process has been maintained. To meet the demands of the SL approach, therefore, technology designers must explore the established processes and institutions of the community user and aim for more participatory methodologies. The scale and design process of technology need not be limited by low technology specifications but promote the diversity of the goals and capacities of the community user, now and into the future.

6.5.Sustainable livelihoods for engineering: the unifying approach

Many of the key international community development and research organisations are promoting a multidimensional approach to technology, including the World Federation of Engineering Organizations and various universities. Apart from the technical aspects of such an approach, other dimensions are considered, including (UKabc, 2005):

- ethical and personal dimensions, which reflect the social and ethical context of the user;
- political and economic dimensions, which include the structures limiting or promoting the opportunities to the user; and
- environmental dimensions, which are the natural factors affecting the use of technology.

The SL approach uses a multidimensional approach to promote all of these elements by uniting the community users, the designers and the policy-makers. Figure 28 illustrates the strength of the bond that SL promotes between technology and people, having

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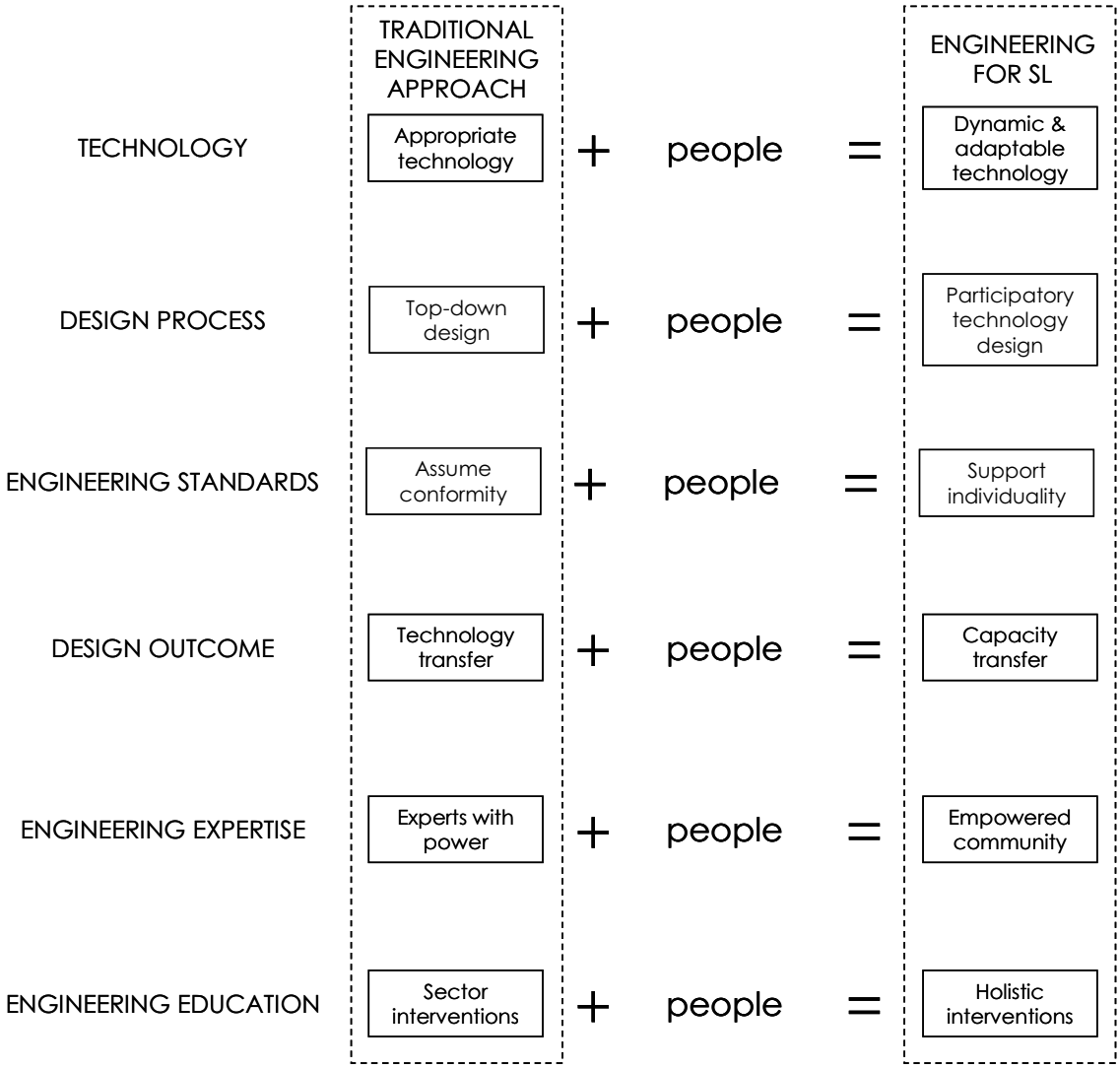
[37] Nor is leapfrog technology the answer to technology for SL with its technology *transfer* approach, conflicting with capacity *transfer* promoted by SL.

realised a focus on the community user in each element of the preceding discussion. The sustainable livelihoods approach therefore unites ENGOs with the users in the community it intends to serve.

Figure 28: People-centred engineering for sustainable livelihoods



6.6.Monitoring and evaluation

With reference to the logframe of Table 14, many of the target indicators were achieved, particularly at the outputs, activities and purpose stages, such as opportunities developed for SL practice, proposals submitted based on SL and key staff members are trained in SL. These were achieved through tools such as systemic analyses, interviews with management staff and review of IDS-Nepal documents. Those not achieved, the implementation of one project based on SL and the removal of barriers for SL practice, were at the goal and purpose stages. The failure to achieve these was based on three of the key assumptions made at the planning phase:

- systemic analyses of practice and subsequent appropriate training will improve SL practice;
- IDS-Nepal has the resources for change; and
- SL practice is a priority for IDS-Nepal.

The first two assume that the ability to change is only internal to the organisation. However, barriers exist that are beyond the control of IDS-Nepal, many of which were discussed in section 6.3.1. This has important implications for the use of powerholders in an approach such as SSM, as explored further below.

The third assumption was proven inaccurate by the low commitment of the participants throughout the research (as discussed in section 6.3.1.3). The necessity of commitment from participants for the success of SSM is also explored further below.

6.7.Discussion on methodology

Where SSM was used effectively to guide the analysis through the complex and pluralistic problem situations of engineering in community development through SL, the following points were highlighted as necessary for greater success in its use:

- definition of the scope: the use of SSM acknowledges that the problem situation is viewed differently by each user of the system, and the necessity to consider these to affect effective change; the subsequent computations of problem situations, variables and analyses can be endless! It is necessary therefore, with research such as this, to ensure that the initial scope is sufficiently defined to focus the extent and possibilities of the analyses.
- commitment from participants and leverage for change: it is essential to ensure ownership by all participants through authentic participatory methodologies. The ability of the participants to identify and follow through on the most economical (that is, where their actions have maximum effect for their input) actions and changes depends on their commitment to the research. Superficial consultation, or less effective methodologies will not achieve the ‘buy-in’ from participants. Without this the cycle of change, action and experience is difficult to achieve.
- use of appropriate (local and absolute) powerholders in the investigation: for real change to occur through SSM analyses the participation of those who are able to turn the ‘ideal’ from the conceptual model phase into real action and change is

required. Where absolute powerholders are not participating (in this case, policy makers, donors etc), it is important to adequately define the boundaries of the systems explored and the possibilities for change.

- effective facilitation: appropriate facilitation gives voice to less powerful participants and helps to distribute resources to empower all participants. Without their inputs and participation the 'human factor' of the messy problems of the research vanishes; commitment may achieve nothing, participation can be limited and the powerholders can dominate the process, returning it to a unitary, simple process solved more simply by traditional "hard" systems thinking.
- adequate timing of the research: above all, where the diversity of the stakeholders and external context is high and the scope of the problem situation broad a timeframe sufficiently long to allow effective systemic investigation, facilitation and participation is required. A shorter timeframe serves only to limit the ability of the participants to define and analyse problems, to affect change, and to revisit the problem situation.

CHAPTER 7. CONCLUSION

This research introduced skills and knowledge appropriate to SL to a grassroots non-government engineering organisation in Nepal. This served as a case study to explore the implications of SL on engineering practice in community development. Challenges and limitations for this practice were identified through systemic analyses of the case-study organisation. Key opportunities for SL were also identified. These opportunities and limitations were then explored in the wider context of engineering organisations. Where previous research has explored the implications of SL on non-sector specific practice, this research specifically explored practice in the engineering sector.

The problem situations for SL practice, as identified by the NGO in the case study, were:

- assisting sustainable and equitable development of community infrastructure and to improve livelihoods;
- adopting the sustainable livelihoods approach;
- meeting the need for community participation;
- monitoring and evaluation;
- developing partnerships;
- learning about the SL approach; and
- addressing the role of technology in community development.

These problem situations for the NGO were largely due to its characteristics and experience as a relatively new grassroots organisation. The greatest barriers to SL practice at this level in the case study included their youth in the community development sector, the competitive nature of the sector, the political conflict of Nepal and donor dependency, all of which impacted upon the survival of the organisation.

Opportunities to overcome these barriers to practice focused on developing stronger partnerships, with donors, policy-makers, the community and meso-level implementers. Improved learning practices were also identified as an opportunity for enhancing SL practice for the organisation in the case study.

Data collected from external stakeholders, from community-level technicians to policy-makers, helped to define and verify the role of SL in engineering in Nepal. In particular,

the community-level reinforced the issues of survival and risk faced by IDS-Nepal and the absence of participation in technology design. Additionally, the higher-level stakeholders highlighted the low profile of SL in engineering in Nepal.

The key opportunity for SL in engineering was through participatory technology design. The research identified a need for engineers to move away from the isolated technical and economic spheres of technology to incorporate the human and cultural dimensions. Therefore, the community users and dynamic technology that is able to adapt to the changing strategies and abilities of the community user became key focuses for engineering practice. This participatory technology design process transfers human capacity instead of the traditional technology transfer. In this process, power is transferred from the traditional engineering 'expert' to empower the community.

Beyond the ENGO, standardisation organisations and regulators have a role in maintaining the focus on people throughout the technology design process, through acknowledging the unique applications and specifications of technology for community development and reflecting this in policy and standards.

Finally, a people focus in engineering education ensures that engineering skills are holistic and cross sectors, contrasting with traditional sectoral educational approaches.

These aspects differentiate between practices for sustainable livelihoods from more recent participatory approaches to community development. They also distinguish SL practice for engineers from practitioners in other sectors of community development.

In this people-centred approach to engineering, it has been demonstrated that whilst appropriate technology aims to supplement the livelihoods of the user, it falls short in complementing their skills and knowledge. This failure therefore infers that the current specifications and processes of appropriate technology are not wholly relevant to SL practice.

Therefore, this research has shown that engineering practice is affected by adopting the SL approach. Practice aims to unite the traditional technical aspects of engineering with the human and cultural elements of the community users.

CHAPTER 8. RECOMMENDATIONS

This research, highlighting opportunities and limitations for engineering practice for SL, was based on a case study defined by the socio-political, environmental and economic barriers surrounding IDS-Nepal at that time. The success of the research could be further enhanced by:

(i) prioritising the research in the organisation to enhance the effectiveness of the participatory methodologies.

(ii) refining the selection criteria for participants at the organisational level, focusing on organisational and resource commitment to the research.

(iii) extending the range of participants to include local and external power holders.[38] By involving these participants their support is encouraged and the viability of opportunities for improved practice are explored early in the research, increasing the possibility for long-term success. This opportunity for effective participation has been noted in action research literature (Callo and Packham, 1999; IAC, 2003).

(iv) developing the effectiveness of facilitation, particularly important for the success of action research and participatory methodologies (Bawden, 1995).

(v) using secondary data from field investigations to verify and complement primary data. While this research project was being conducted, community development agencies were increasingly restricted in the duration and location of their activities due to the political conflict of Nepal. In some cases, donors totally withdrew activities completely from Nepal. This limited the range and scope of projects available to IDS-Nepal and its ability to pilot the SL approach, restricting opportunities for secondary data collection.

Further investigations into SL practice specific to *engineering* in community development could include:

(vi) investigating the differences in practice between technical and non-technical engineering roles. Apart from in the introductory workshop in the case study,

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[38] Donors and policy-makers external to an organization such as IDS-Nepal have the ability to restrict or encourage practices within the organization.

the key participants were all female and in non-technical roles, and were primarily involved in report preparation and networking.[39] Their participation was defined largely by staff availability, not by their specific organisational roles, gender or skills. In the political context of Nepal it was considered inappropriate for females to conduct fieldwork for safety considerations. Thus, the females, who were all non-technical, were largely confined to office-based tasks or secure urban sites. Their availability for workshops and training was therefore greater than the availability of the male technical staff. Whilst such a division, based on gender, skills or roles is common to many NGOs, the challenges and appeal of SL to technical roles may demonstrate differences.

(vii) exploring engineering practice in more technically focused or large-scale infrastructure engineering organisations. Whilst Schumacher (1993) himself notes that larger and more sophisticated technologies are less likely to be an urgent need of the poor and Franks, et al. (2004) question the suitability of SL to large sectoral interventions, the scope of technology in poverty reduction is so broad (DFID, 2000b) that small-scale technology cannot necessarily address all needs of community development activities.

[39] Additionally, these participants were from non-engineering backgrounds. Whilst the participants were a sociologist and an environmental scientist, engineering staff supported them throughout their roles in IDS-Nepal. Additionally, this staff developed technical ability through extensive practical experience in the field and postgraduate studies. Under these conditions the participants are considered to be representative of ENGO staff.

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ANNEX A

Survey Instrument

SUSTAINABLE LIVELIHOODS SURVEY (Policy-Level)

Name: .....

Position:..... Education: .....

Department's Name:..... Date of establishment: .....

Address of Department: .....

.....

DEPARTMENT HISTORY

1. In which districts has your Department worked in the last three years?.....

   .....

   .....

   .....

2. Who are your main partners/donors and in which sectors do these partners work? (Consider community level, local and national governing bodies, NGOs, INGOs) (If you require more space, please attach an additional sheet)

Partners/donors	**How long have you worked with them?**	**Do they work with the Sustainable Livelihoods approach?**	**Working sector**

STAFF

3. How many people work in your Department? .....
4. What is the educational background of the staff in your Department? .....

.....

.....

ACTIVITIES

5. How many projects have you worked on in the last three years? And what type of projects are these? (e.g., needs analysis, problem identification, technology design, intervention implementation, monitoring and evaluation)

Project	**Type of project**	**Length of project**	**Approx. no. of beneficiaries**	**Approx. budget**

6. How do you develop projects/programmes with partners?
   - Project advertisements ☐
   - Long-term programme-building as partners ☐
   - Advertised grants ☐
   - Concept papers ☐
   - Other (please specify) .....
   .....
7. Is selecting partners for projects/programmes a competitive process? If yes, please specify the most important criteria in the selection process (where 1 is the most important and 3 is the least important).....
   - Staff ☐
   - Financial Proposal ☐
   - Technical Proposal ☐
   - Other (please specify) .....
   .....
8. Who designs project interventions/technology?
   - Donor ☐
   - NGO ☐
   - Community ☐
   - Combination of the above ☐
   - Other (please specify) .....
   .....
9. Do you address environmental impacts in your projects? If so, how? .....
   - Formal assessment ☐
   - Community discussion ☐
   - External consultant ☐
   - Other (please specify) .....
   .....
10. Are your projects financially self-sustaining? If yes, how?.....
    - Operations and maintenance fund ☐
    - Donor funds ☐
    - CBO internal funds ☐
    - User-group/CBO-generated revenue ☐
    - Project overhead funds ☐
    - Other (please specify) .....
    .....

11. How do you work with CBOs?
    - Financial training ☐
    - Managerial training ☐
    - Technical training ☐
    - Computer training ☐
    - No training is provided ☐
    - Other (please specify) .....
      .....
12. Do government policies support your projects? .....
      .....
      .....
13. Do you feed back into government policy? If yes, how? .....
    - As a partner ☐
    - Future projects planning ☐
    - Current project planning ☐
    - Through Concept Papers ☐
    - Through Steering Committees ☐
    - Other (please specify) .....
      .....

MONITORING AND EVALUATION

14. How long is monitoring and evaluation carried out for (both during and after projects)? .....
      .....
15. What is monitored in these projects? (please tick as appropriate to your projects)
    - Distribution of infrastructure ☐
    - Quantity of infrastructure ☐
    - Quality of construction ☐
    - Financial aspects ☐
    - Relevance to community ☐
    - Acceptance by the community ☐
    - Community representation in project ☐
    - Other (please specify) .....
      .....
16. Who carries out the monitoring and evaluation?
    - CBO/community ☐
    - Donor ☐
    - NGO ☐
    - Line agencies ☐

No monitoring and evaluation is carried out ☐

Other (please specify) .....

.....

17. Who uses the monitoring and evaluation data?

CBO/community ☐

Donor ☐

NGO ☐

Line agencies ☐

Monitoring and evaluation is not carried out ☐

Other (please specify) .....

.....

COMMUNITY PARTICIPATION

18. What participatory tools do you use in your projects (e.g., interviews, Venn Diagrams, seasonal calendars, transect walks, focus groups etc)? .....

.....

.....

.....

19. How is/are the community/CBOs involved in your projects?

Needs analysis ☐

Project design ☐

Infrastructure design ☐

Implementation

Labour ☐

Cash contribution ☐

Monitoring and evaluation ☐

Other (please specify) .....

.....

20. Who selects which community members participate?

Community leaders ☐

User group members ☐

NGO ☐

Community ☐

Donor ☐

Other (please specify) .....

.....

.....

21. How are community members selected?

- Voting ☐
- Group discussion ☐
- All households ☐
- Random sample ☐
- Group leaders ☐
- Minority group quota allocation ☐
- Other (please specify) .....

.....

22. Besides community members, what other stakeholders are involved in your activities?

- VDC/DDC members ☐
- Line agency staff ☐
- Other CBOs ☐
- Other NGOs/INGOs ☐
- Other (please specify) .....

.....

23. How are these other stakeholders involved?

- Needs analysis ☐
- Project design ☐
- Infrastructure design ☐
- *Implementation*
  - Labour ☐
  - Cash contribution ☐
- Monitoring and evaluation ☐
- Policy change ☐
- Other (please specify) .....

.....

LEARNING ABOUT SUSTAINABLE LIVELIHOODS

24. For how long have you been working with the Sustainable Livelihoods approach? .....

.....

25. Have you attended/provided any Sustainable Livelihoods training? If so, please provide details (i.e., implementing organization, duration, focus).....

.....

.....

.....

.....

26. On which core Sustainable Livelihoods concepts do you focus? .....

27. How are you learning about Sustainable Livelihoods?

External training ☐

Partner organisations ☐

Pilot projects ☐

Change teams ☐

Other (please specify) .....

.....

28. What changes have you made to your processes due to Sustainable Livelihoods?

Longer projects/programs ☐

More skills diversity ☐

Change in technology design ☐

Greater community participation ☐

Longer monitoring and evaluation ☐

Greater government links ☐

Other (please specify) .....

.....

29. With which Sustainable Livelihoods model are you working? If you are using your own model, please specify changes made. .....

.....

.....

30. Please rate the sustainability of the Sustainable Livelihoods approach as below (where 1 is not sustainable, 2 is moderately sustainable, 3 is very sustainable).

	1 (not sustainable)	**2 (moderately sustainable)**	**3 (very sustainable)**
Environmental	☐	☐	☐
Financial	☐	☐	☐
Social	☐	☐	☐
Institutional	☐	☐	☐

31. What limits your effectiveness in the implementation of your activities through Sustainable Livelihoods approach?

Inadequate skills ☐

Lack of funds ☐

Lack of time ☐

Improper management ☐

Political unrest ☐

Lack of partners ☐

Lack of information ☐

Other (please specify) .....

.....

32. Do you have further Sustainable Livelihoods training needs? Please specify.....

.....

.....

.....

.....

WORKING MODALITY

33. With which modality or modalities do you work? What are the key components of this modality?.....

.....

34. How successful do you rate this approach for your Department and the community?

    Not at all successful ☐

    Moderately successful ☐

    Very successful ☐

35. Please rate the sustainability of this approach as below (where 1 is not sustainable, 2 is moderately sustainable, 3 is very sustainable).

	1 (not sustainable)	**2 (moderately sustainable)**	**3 (very sustainable)**
Environmental	☐	☐	☐
Financial	☐	☐	☐
Social	☐	☐	☐
Institutional	☐	☐	☐

36. Do your projects address the livelihoods of people? If yes, how?.....

    .....

    .....

37. What limits your effectiveness in the implementation of your activities?

    Inadequate skills ☐

    Lack of funds ☐

    Lack of time ☐

    Improper management ☐

    Political unrest ☐

    Lack of partners ☐

    Lack of information ☐

    Other (please specify) .....

ANNEX B
External Stakeholders' Data

POLICY LEVEL ORGANISATIONS

Department for International Development

An interview was conducted with the Sustainable Livelihoods Advisor of DFID on 4 August 2004.

Helen Salvestrin (HS): Where does DFID work?

Sustainable Livelihoods Advisor (SLA): DFID works in 61 to 65 districts of Nepal.

HS: Describe DFID's strategy.

SLA: DFID's work for the next three to four years is outlined by the Country Assistance Plan (CAP). This focuses on the four key pillars of HMGN's Poverty Reduction Strategic Plan (PRSP), namely pro-growth, basic services (health, infrastructure, education etc.), governance and social inclusion. An additional focus of the CAP is peace-building. The pro-growth pillar is the primary focus of DFID, where their key SL programmes are conducted. Of the £37m in 2004, and proposed £47m budget for 2005, pro-growth and SL have the biggest portfolio.

HS: Who are your main partners?

SLA: DFID act as programme managers for selected programmes (such as the Livelihoods and Forestry Programme). DFID works with other INGOs, multi-laterals such as World Bank and UNDP and has a bilateral agreement with HMGN.

HS: How has the sustainable livelihoods approach affected DFID's activities?

SLA: Traditionally, DFID implemented short-term, output-oriented *projects* that had little or no impact on government or at policy level. More recently, DFID is implementing longer-term outcome-oriented programmes, which aim to link up with governments to effect change in policy, institutions and processes. Thus, DFID's activities are no longer merely about building water systems, but more so the impact of such works, and the linkages which these affect or by which they are affected.

At the activity level, there is little change. That is, infrastructure is still provided. The biggest change from projects to programmes is the influence at upper-level policy. Programme design has to develop clear linkages between macro-meso-micro levels. Central level governance is also linked to VDC/DDCs. Programme identification, design and the lead-up to implementation can take up to one and a half years, to guarantee appropriate linkages for long-term sustainability.

DFID programmes aim for a high degree of flexibility. Programme goals tend to stay the same, but activities and timescales change.

HS: How is monitoring and evaluation carried out?

SLA: DFID's monitoring and evaluation programmes include output proposal review, project/poverty monitoring framework (PMF) and livelihood and social inclusion monitoring. This is indicative of DFID's broader aim of improving livelihood outcomes, not just income generation.

HS: How is DFID staff learning about SL?

SLA: DFID staff attended training on the broad concepts of SL, held in Nepal in 2003 and conducted by an international development agency. This course introduced the concepts and methodologies of SL, with little focus on the Nepali situation. It was run on an international budget, which restricted participation from local-level organisations. DFID conduct SL training for their implementing partners.

Ministry for Physical Planning and Works

An interview was held with the Joint Secretary of MPPW of HMGN on 15th September 2004.

Helen Salvestrin (HS): Tell me about the background of MPPW.

Joint Secretary (JS): The Ministry is an apex organisation that provides technical and financial support for the development of safe water and sanitation for rural people. More recently, the Ministry has provided help for urban people. The Ministry provides basic infrastructure and service level improvement. Fifteen professionals, all with technical backgrounds, work in the water and sanitation (WatSan) division.

HS: Are your projects financially self-sustaining? If so, how?

JS: For the financial sustainability of its programmes, the Ministry requires 1% upfront cash from the community for operations and maintenance in rural areas; in urban areas they require up to 5%.

HS: Do you address environmental impacts in your projects? If so, how?

JS: Environmental assessment of projects is the domain of MOPE. For bigger projects, MOPE conducts an environmental impact assessment (EIA). A requirement of this is to advertise the project and hold public hearings concerning the details. "Bigger" projects are defined by the population that they serve (greater than 20,000 people), or by the discharge they will generate (greater than 25l/s). Smaller projects are the responsibility of MPPW. An Internal Environmental Assessment (IEA) must be conducted.

HS: Previous discussions have suggested that environmental assessment is largely through community discussion. Is that so?

JS: No, it is through a formal structure.

HS: How is monitoring and evaluation carried out?

JS: A unit designed specifically for purpose of monitoring and evaluation (M&E) has recently been established and supported by DFID. M&E focuses specifically on quality of construction, fund flows and to evaluate completed projects.

HS: Does MPPW work with the SL approach?

JS: No, the Ministry is not aware of the SL approach.

HS: What partners does MPPW work with?

JS: The Ministry works directly with all stakeholders, including the community, CBOs, NGOs, all the major donors in Nepal, as well as other government bodies such as Ministry of Local Development, Ministry of Population and Environment (MOPE), Water and Energy

Commission, Nepal Bureau of Meteorology, Nepal Planning Commission and Rural Water Supply and Sanitation Fund Development Board and private stakeholders including Institute of Engineers.

HS: How are partners selected?

JS: Partner selection is based on a combination of financial and technical expertise (20% financial, 70–80% technical).

HS: How does MPPW work with their partners?

JS: Bi-monthly meetings with these stakeholders collate experiences from the field and help to formulate Ministry policy.

HS: In what phases of the project does the community participate?

JS: The Ministry does not work directly with the community beyond need identification. The community identifies a need and provides upfront cash. NGOs and CBOs are the implementing partners who define the project and design. A top-down approach is used, where the community has little input into the design or cash flow.

INGO LEVEL

Livelihoods and Forestry Programme

The Livelihoods and Forestry Programme (LFP) was a part of the engineering sector through its interest in alternative energy forms to forest wood. Several discussions were conducted with both the Terai Forestry Advisor and Hills Forestry Advisor in Kathmandu, Nepal throughout 2004, with the researcher and IDS-Nepal's programme manager. This is a transcript of an interview with the Terai Forestry Advisor on 13 August 2004.

Helen Salvestrin (HS): Tell me about the background of Livelihoods and Forestry Programme.

Terai Forestry Advisor (TFA): LFP is a joint HMGN and DFID programme. It is a ten-year programme that works directly with Ministry of Forestry (MoF).

HS: Where does LFP conduct its activities?

TFA: LFP conducts most of their programme in three districts in the Terai.

HS: How many people work for LFP and what is their background?

TFA: Over 120 professionals and non-professionals work in eleven LFP offices. Whilst most of the professional staff have a forestry background, key coordination staff have strong SL experience.

HS: How is SL used in LFP?

TFA: The initial contract defined the programme in terms of livelihoods, but it has been a continuous battle with MoF to implement this. MoF prefers a narrow forestry programme.

HS: How does LFP work with the community?

TFA: LFP programmes focus largely on the external context and institutions (policies, institutions and processes) in the communities they work. At this level, however, these aspects of the community are not homogenous and therefore household-level investigations are necessary.

HS: What is LFP's entry point for their activities?

TFA: In many of the districts that LFP is working, particularly in the Terai, forestry is not a top priority. They find the top priority of existing CBOs (often health, education, water, agriculture, roads, electricity etc). LFP works through this entry point, quite often through community forestry, to gain the trust of the community and show tangible results within the conflict situation. This then allows them to follow up with appropriate community forestry interventions. In the Terai, where community forests are not so common, LFP works to promote

public land forestry, alternative energy, private forestry and the consumption of forestry products.

HS: Does LFP feed back into government policy and if so, how?

TFA: LFP aims to influence policy-making through presenting papers and data as evidence from the field directly at the ranger level, and through DDCs. However, little attention is given at the central governance level to input from the districts. HMGN expects LFP to follow policy, rather than change it, however, its annual planning process is poor and not reflective of local conditions. It is desirable to have HMGN's representatives on LFP's project management committees to enable direct feedback to the government.

Another alternative, to improve the chances of change from the community level is to tie aid to conditions. LFP does not put conditions on its aid.

HS: Does LFP work with other partners?

TFA: LFP is more recently trying to form a partnership with Soil Conservation Office (SCO) in order to affect policy. SCO, on the other hand, is eager to take advantage of the resources that LFP has to offer.

HS: How is the political conflict affecting LFP's activities?

TFA: Currently, political conflict is severely restricting progress in one district, where violence is escalating. Additionally, one of the local conflicting parties is prohibiting the continuation of LFP's activities. Higher divisions of the party will assess project documents to determine if LFP's activities coincide with their own development initiatives.

Activities of the District Forestry Office (DFO) have been stopped by the local parties to the conflict, due to corruption and a lack of transparency.

HS: How is LFP learning about SL?

TFA: Understanding the theory of "livelihoods" amongst LFP staff is good, however, the practical implementation of this is less. Staff are moving towards it more through peer pressure. Staff are unwilling to change, especially if such a change is going to challenge vested interests, which is quite common in Nepal. It is important to show clear linkages between forestry and livelihoods to encourage people to use the approach.

HS: Does LFP offer any external training?

TFA: LFP has conducted SL training with DFO and NGO partners.

HS: How is monitoring and evaluation carried out?

TFA: The LFP impact framework has been developed over the past three years, focusing on impacts, behavioural changes and their effects. Depending on the indicator, the framework samples at both group and household levels.

In the Terai, as the initial data collection was for project planning, a thorough, household level survey was conducted. However, in the hills the data was collected for future M&E, so a baseline sample survey only was conducted.

Intermediate Technology Development Group

An interview was conducted with a Programme Coordinator from Intermediate Technology Development Group on 17th August 2004.

Helen Salvestrin (HS): Tell me about the background of ITDG.

Programme Coordinator (PC): ITDG has been conducting its projects in Nepal since 1979. They work to enhance community empowerment and community-based technologies. They primarily work on very local-scale participative research and development projects to develop technology appropriate to the community to enhance incomes. Such projects include microhydro, gravity ropeway transportation, wild fruit oil extractors and sasto (cheap) solar dryers.

TABLE B1: COMMUNITY-LEVEL SURVEY PARTICIPANTS

Organisation	**Participant**
Eco Center	Team Leader
Nepal Red Cross Society	Field Coordinator
SJAYC	Field Coordinator/Software Supervisor
Didi Bahini	
Association for Rural Social Welfare-Nepal	Secretary (Field Coordinator/Software Supervisor)
Sunrise Social Club	Field Coordinator/Software Supervisor
Society for Youth Activity	Software Supervisor
Nepal Red Cross Society	Secretary
Nepal MSR Centre	Software Supervisor
Invitepto Nepal	Field Coordinator/Software Supervisor
VIS (Sukute)	Field Coordinator/Software Supervisor
Society for Youth Activity	Team Leader
Parapakar Primary Health Care Centre	Field Coordinator
Kamadhenu	Field Coordinator/Software Supervisor
Nepal MSR Center	Programme support manager
Rural Development Center	Team Leader
MSSS	Team Leader, secretary
Decon Nepal	Team Leader
Parapakar Primary Health Care Centre	Executive Director
Social Welfare Committee	Treasurer
Social Welfare Committee	Chairman
Farmer Managed Irrigation Systems Promotion Trust	Programme Officer

COMMUNITY-BASED ORGANISATIONS

Tables B-2 to B-7 summarise the data collected from the participants.

TABLE B2: ORGANISATIONAL BACKGROUND

Organisation	Date of establishment	Sector involvement
Eco Center	1995	WatSan, agriculture, forestry, integrated
Nepal Red Cross Society	1971	WatSan, health
SJAYC	1991	WatSan, education, agriculture, health, rural energy
Didi Bahini	1993	WatSan, women's empowerment
Association for Rural Social Welfare-Nepal	1993	
Sunrise Social Club	1990	All, ICS
Society for Youth Activity		WatSan, health
Nepal Red Cross Society	1971	WatSan, education, health
Nepal MSR Centre	1991	WatSan, education, forestry, health, integrated, women's empowerment, micro-finance, income generation
Invitepto Nepal	1993	WatSan, education, health, integrated, human rights
VIS (Sukute)	1991	WatSan, health
Society for Youth Activity	1996	WatSan, health, income generation
Parapakar Primary Health Care Centre	1992	WatSan, education, forestry
Kamadhenu	1992	WatSan, education
Nepal MSR Center	1992	WatSan, health
Rural Development Center	1993	WatSan, health, roads
MSSS	1990	WatSan, agriculture, health, integrated, income generation, micro-finance
Decon Nepal	1991	WatSan, education, agriculture, health, integrated
Parapakar Primary Health Care Centre	1992	WatSan, education, forestry, health, integration
Social Welfare Committee	1983	WatSan, education, agriculture, health
Social Welfare Committee	1983	WatSan, education, agriculture, health
Farmer Managed Irrigation Systems Promotion Trust	1998	Irrigation

TABLE B3: SUSTAINABILITY IN COMMUNITY DEVELOPMENT ACTIVITIES

Organisation	Financial project support	Environmental assessment	CBO support
Eco Center	Project overhead funds	External consultant	Managerial
Nepal Red Cross Society	O&M funds, Donor funds, project overhead funds	Community discussion	Software
SJAYC	O&M funds, CBO internal funds, user-group-generated funds	Community discussion	Financial, managerial and technical training, women's empowerment, gender equality, basic education, institutional development, sustainable development
Didi Bahini	Donor funds, user-group-generated funds	Community discussion	Managerial
Ass'n for Rural Social Welfare-Nepal	O&M funds, CBO internal funds, user-group-generated funds	Community discussion	Financial, managerial, technical training, women's empowerment, gender, institutional development, quality basic education, sustainable development
Sunrise Social Club	Project overhead funds	Community discussion	
Society for Youth Activity	O&M funds, donor funds, project overhead funds	Community discussion	
Nepal Red Cross Society	User-group-generated-funds	Formal assessment, community discussion	Financial, managerial and technical training
Nepal MSR Centre	Project overhead funds		Managerial, technical training
Invitepto Nepal	All	Community discussion	Financial, managerial and technical training
VIS (Sukute)	User-group-generated funds	Formal assessment, community discussion	All
Society for Youth Activity	Donor funds	Community discussion	All
Parapakar Primary Health Care Centre	Donor funds	Community discussion	All
Kamadhenu	O&M funds	Community discussion	Technical
Nepal MSR Center	Project overhead funds	Community discussion	All
Rural Development Center	CBO internal funds	Community discussion	Financial and managerial training
MSSS	O&M funds	Community discussion	Managerial and technical training
Decon Nepal	O&M funds	Community discussion	All

Parapakar Rimary Health Care Centre	Donor funds	Community discussion	Managerial training
Social Welfare Committee	O&M funds	Community discussion	Managerial training
Farmer Managed Irrigation Systems Promotion Trust	Other	Community discussion	Institutional training, field visits, problem identifying and interactive workshops

TABLE B4: MONITORING AND EVALUATION AND PARTICIPATION

Organisation	Implementation of M&E	Object of M&E	Participatory tools
Eco Center	CBO/community, donor	Community representation	Interview, seasonal calendars, transect walks, focus groups
Nepal Red Cross Society	CBO/community, donor	All plus women's empowerment and environmental situation	Community map, sarar tools, seasonal calendars, focus groups, group discussions, pictoral tools and interventions
SJAYC	All	All	People central development concept
Didi Bahini	Donor, NGO	All	Interview, focus group, seasonal calendars
Ass'n for Rural Social Welfare-Nepal	All	All	Focus-group discussion, interviews, seasonal calendars, PRA, SARAR, venn diagram, 3A tools
Sunrise Social Club	NGOs, line agencies	Relevance to community, community representation	PRA, SARAR etc
Society for Youth Activity	CBO/community, donor	All plus women's empowerment and environmental situation	Community map, SARAR tools, seasonal calendar, focus group, group discussion, pictoral tools and interviews
Nepal Red Cross Society	Donor, NGO	All	Seasonal calendars
Nepal MSR Centre	Line agencies	Quality of construction, community representation	PRA, RRA, SARAR tools
Invitepto Nepal	CBO/community, NGO, line agencies, support agencies	All and participation of women	Inteveiws, Venn diagrams, seasonal calendars, SARAR etc
VIS (Sukute)	Donor, NGO	Financial aspects, relevance to community	Seasonal (chart) calendars, interviews
Society for Youth Activity	Line agencies	Relevance to community	
Parapakar Primary Health Care Centre	Donor	Financial aspects. Also NGO top management monitored	Interviews, focus group, seasonal calendars etc
Kamadhenu	Community/CBO, donor, NGO	Acceptance by the community	PRA, SARAR tools, CAP, focus groups etc

Nepal MSR Center	CBO/community, NGO	Distribution and quantitity of infrastructure, construction quality, financial aspects	Social map, transect walk, focus group, interviews etc
Rural Development Center	No M&E	Acceptance by the community, community representation	Focus groups, mass meetings
MSSS	Line agencies	Distribution/quantity of infrastructure, quality of construction, community representation	
Decon Nepal	Donor	Infrastructure quantity, community representation	SARAR tools
Parapakar Rimary Health Care Centre	Donor	Acceptance by the community	As a determined by RWSSFDB
Social Welfare Committee	Donor	Quality of construction	Focus groups
Farmer Managed Irrigation Systems Promotion Trust	FMIS experts and learned scholars	Relevance to community	Structured questionnaires, interview schedules, transect walks, focus groups etc

TABLE B5: COMMUNITY PARTICIPATION

Organisation	Phase of community participation	Who selects community participants	Method for selecting community participants
Eco Center	Project design, M&E	Community, donor	All households
Nepal Red Cross Society	All	User group members and community	Mass meeting
SJAYC	All	Community leaders, user group members, NGO, community	Voting, group discussion, all households
Didi Bahini	Needs analysis, M&E	Community leaders, NGO	Group discussion
Ass'n for Rural Social Welfare-Nepal	All	User group members and community	Group discussion, all households, minority group quota allocation
Sunrise Social Club	M&E	Community leaders and community	All households
Society for Youth Activity	All	User group members, community	Group discussion, mass meeting
Nepal Red Cross Society	All	User group members	Group discussion, all households, random sample
Nepal MSR Centre	All but infrastructure design	User group members	Group discussion
Invitepto Nepal	All	User group members	Group discussion
VIS (Sukute)	All	User group members	Group discussion, all households, random sample
Society for Youth Activity	Needs analysis, cash contribution	User group members	Voting, group discussion
Parapakar Primary Health Care Centre	Project design	Community leaders	Voting, mass meeting, group discussion
Kamadhenu	Needs analysis, project design	User group members	Group discussion
Nepal MSR Center	All but M&E	User group members, community	Minority group quota (for women), group discussion
Rural Development Center	Needs analysis, labour, cash contribution	Community	Group discussion
MSSS	Labour	User group members	Group discussion, minority group quota

Decon Nepal	Planning and M&E	User group members	Group discussion
Parapakar Rimary Health Care Centre	Needs analysis, project design, labour, cash contribution	User group members, community	Group discussion, random sample
Social Welfare Committee	Needs analysis	Community	Group discussion
Farmer Managed Irrigation Systems Promotion Trust	On a voluntary basis and on the felt need of the community	User group members	By consensus

TABLE B6: ROLE OF EXTERNAL STAKEHOLDERS AND LIMITATIONS TO CURRENT PRACTICE

Organisation	External stakeholders - who	External stakeholders - task	Limitations
Eco Center	CBO	Project design	Improper management
Nepal Red Cross Society	VDC/DDC, CBO	Needs analysis, M&E	Lack of funds and info, political unrest
SJAYC	All	all	Lack of funds
Didi Bahini	VDC/DDC, CBO	Needs analysis, project design	Inadequate skills, lack of funds, improper management, lack of info
Ass'n for Rural Social Welfare-Nepal	Line agencies, VDC/DDC, CBO	Needs analysis, project design, M&E	Political unrest
Sunrise Social Club	VDC/DDC	Needs analysis, labour	Lack of funds, political unrest
Society for Youth Activity	VDC/DDC, CBO	Needs analysis, M&E	Lack of funds, political unrest, lack of info
Nepal Red Cross Society	Line agencies, VDC/DDC	M&E	Lack of funds, political unrest, lack of info
Nepal MSR Centre	VDC/DDC	M&E	Lack of funds, political unrest
Invitepto Nepal	All	All	Political unrest
VIS (Sukute)	Line agencies, VDC/DDC	Needs analysis, project design, M&E	Lack of funds, lack of info
Society for Youth Activity	VDC/DDC	Needs analysis	Lack of funds
Parapakar Primary Health Care Centre	VDC/DDC	Needs analysis	Lack of funds
Kamadhenu	VDC/DDC	M&E	
Nepal MSR Center	VDC/DDC	Needs analysis, cash contribution	Lack of funds, time and partners
Rural Development Center	NGO, VDC/DDC	Cash conribution, M&E	Lack of funds and information, political unrest
MSSS	VDC/DDC	Support	
Decon Nepal	VDC/DDC	M&E	Lack of funds
Parapakar Rimary Health Care Centre	VDC/DDC	Needs analysis	Improper management, lack of funds
Social Welfare Committee	VDC/DDC	Needs analysis	
Farmer Managed Irrigation Systems Promotion Trust			Political unrest, lack of information

TABLE B7: DEVELOPING PROJECTS

Organisation	Finding work - approach	Finding work - important criteria
Parapakar Primary Health Care Centre	Long-term partnerships	Staff
Kamadhenu	Advertisements, concepts papers	Staff
Nepal MSR Center	Advertisements, long-term partnerships	Experience, financial and technical
Rural Development Center	Concept papers	Technical
MSSS	Concept papers	Technical
Decon Nepal	Advertised grants	
Parapakar Rimary Health Care Centre	Concept papers	Technical
Social Welfare Committee	Concept papers	Technical
Farmer Managed Irrigation Systems Promotion Trust		

ANNEX C

Human Ethics Approval

(Application for Approval

Memorandum of Understanding

Consent Form

Information Sheet

Amendment to Application for Approval

Final Report)

OFFICE USE: ____/____

APPLICATION FOR APPROVAL (STUDENTS)
UTS HUMAN RESEARCH ETHICS COMMITTEE

PROJECT TITLE: Sustainable Livelihoods Approach and Development in Engineering Institutions

Primary Supervisor (for correspondence to be directed to): Andrew Mears	
Faculty/School: Engineering	Address: Room 32, Building 1, Level 24 Faculty of Engineering University of Technology, Sydney PO Box 123, Broadway, NSW 2007
Email: Andrew.Mears@eng.uts.edu.au	Phone No: (02) 9514 2427
Qualifications: BE (Electrical), ME (Research) (Manufacturing and Process Control), PhD (Health Sciences)	
Experience relevant to this application: Several years of participatory project design, monitoring and evaluation in developing countries for consultancy and research.	
Co-supervisor (if primary supervisor not available): Prasanthi Hagare	
Faculty/School: Engineering	Address: Building 2, Level 6, Faculty of Engineering University of Technology, Sydney P.O.Box 123, Broadway, NSW 2007
Email: prasanthi.hagare@uts.edu.au	Phone No: (02) 9514 1952
Qualifications: BSc (Andhra), MSc (Hyderabad), MTech (IIT), PhD (UTS)	
Experience relevant to this application: Several years of project work in developing countries, working towards long-term sustainability.	
Student: Helen Salvestrin	
Faculty/School: Engineering	Address: 3 Pacy Place, Tea Gardens, NSW 2324
Email: helensal@eng.uts.edu.au	Phone No: (02) 4997 2291
Qualifications: B Eng (Environmental) (1st Class Honours)	
Experience relevant to this application: Three years in consultancy and government engineering roles. Undergraduate thesis on resource use in minority groups.	

DEGREE BEING UNDERTAKEN

Master of Engineering

HAVE CANDIDATURE AND SUPERVISOR BEEN APPROVED? (If yes, attach a copy of your letter of approval. If no, please contact Ethics Officer before proceeding.)

Yes

FUNDING:

(a) Is this research funded? If yes, list the source of funding and attach a copy of the funding approval and budget page from the funding application.

Yes. AusAID and UTS

(b) Total amount of funding (including in-kind contribution)

AusAID: $13,200 + return airfare (Sydney to Kathmandu). This is a living allowance for the time in Nepal. UTS: $5,000. Faculty of Engineering – Management, Policy and Practice Scholarship UTS: $18,484. UTS Doctoral Scholarship

(c) What is your relationship to the funding source (e.g. grant/scholarship recipient, industry partner, contractor, employee, office bearer, personal, other)?

Sponsored by AusAID's Australian Youth Ambassadors for Development program. Grant/scholarship recipient from UTS.

PROPOSED COMMENCEMENT DATE:	May 2004

PROPOSED COMPLETION DATE:	July 2005

SECTION I – METHODOLOGY AND RESEARCH DESIGN

The purpose of this section is to place your research in context for the Committee and demonstrate your ability to conduct the research. The Committee may only approve research which is methodologically sound. Remember to use simple language which can be understood by people from a variety of backgrounds. Avoid jargon and acronyms.

1. DESCRIPTION OF YOUR RESEARCH

(a) What is your research about? Please include details of your aims/hypotheses or research questions and the significance of your research.

The Department for International Development (DFID) and United Nations Development Programme (UNDP) committed in 1997 to reduce the number of people living in poverty by 50% by 2015. Instead of the top-down approach that development providers have been using in recent times, DFID is committed to using the people-centred Sustainable Livelihoods (SL) approach to build capacity in poor communities for sustainable growth. This sector-wide approach challenges the structure and organisation and method of provision throughout the development sector. Australia alone provides nearly $200 million worth of government aid assistance for the provision of essential infrastructure in 2001–2002. For such large financial investments it is crucial to develop effective and sustainable programmes. The success in reducing the number of poor already through the implementation of the SLA has been noted by several of the large international development agencies. As a volunteer with AusAID's Australian Youth Ambassador for Development (AYAD) Program, I will be based in Kathmandu, Nepal for one year, working with the Integrated Development Society-Nepal (-Nepal) as a projects engineer, developing projects and manuals for water and sanitation and renewable energy projects using the SL approach. During this period, I will make a case study with the staff of IDS-Nepal identifying the changes involved in implementing the new framework. The hypothesis I will be exploring is that the adoption of the Sustainable Livelihoods approach to engineering development will have characteristic changes to the organisational structures and processes within engineering-type organisations.

(b) What do you hope the outcome of this research will be?

I hope this research will provide direction for other engineering service providers in the development sector to implement multi-sectoral approaches, in particular the sustainable livelihoods approach, for more long-term sustainable development.

(c) Please give a brief description of the research design (approximately 200 words)

I will spend one year working as a Project Engineer with Integrated Development Society-Nepal (IDS-Nepal), a non-government organisation in Nepal. During this year, various projects will be implemented in rural Nepal based on the SL approach with IDS-Nepal. Participatory research methods will be used to determine changes in IDS-Nepal's processes and structures throughout the implementation of projects using the SL approach. This time will serve not only as data collection for this research, but will develop IDS-Nepal's capacity in SL. It is important to note that the integration of the SL approach has been identified as a goal in IDS-Nepal's strategic plan. A scoping study will be used to determine the number of participants, their role and their commitment to the research. This study will be carried out during the normal course of my role with IDS-Nepal with senior staff. Qualitative data with respect to the functions and processes of engineering service provision will be collected through participatory action research. Workshops and semi-structured interviews will be carried out to allow IDS-Nepal staff to identify dimensions of the engineering

organization, such as management processes, programmes, skills, design and technology and budgets and timelines. Additionally, through my role as an engineer I will be able to collect qualitative data through observation of daily practices. Secondary data will be collected from IDS-Nepal documents. Action research will be emphasised to build capacity within IDS-Nepal and other local organisations.
Soft systems methodologies will be used to generate models of the real systems to identify those institutional areas requiring change to enhance the delivery of engineering projects through the SL approach.

2. LITERATURE REVIEW AND REFERENCE LIST

(a) Please give a brief literature review of no more than 500 words. The aim is to explain how your research fits into the context of other research in the area.

The aim of the SL approach is to enhance capability in facing change and unpredictability, improve equity and increase social sustainability by reducing external stress and shocks by providing safety nets (Solesbury, 2003).
The sustainable livelihoods approach (SLA) aims to identify and develop the assets, strategies and strengths of poor groups across tradition development sectors (Farrington, 2001). The framework:

views people as operating in context of vulnerability. Within this context, they have access to certain assets or poverty reducing factors. These gain their meaning and value through the prevailing social, institutional and organizational environment. This environment also influences the livelihood strategies – ways of combining and using assets – that are open to people in pursuit of beneficial livelihood outcomes that meet their own livelihood objectives (Department for International Development, 2001).

Sustainable livelihoods include consumption and income necessary for livelihoods. More importantly, however, livelihoods are sustainable when they have the ability to handle stress and shocks and to satisfy basic needs (Chambers and Conway ,1992).
The importance and implementation of participation is detailed throughout the SL framework toolbox, in all stages of a programme, from identification and design, planning new programmes, analysis of PIPs, review and monitoring and evaluation (Department for International Development, 2001).
Extensive literature can be found regarding SLA through the Department for International Development (DFID), the United Nations Development Programme (UNDP), Institute of Development Studies (IDS), Food and Agriculture Organization of the United Nations (FAO) and Overseas Development Institute (ODI).
There is agreement between many authors and major international development agencies (World B,ank, 1998; Organisation for Economic Co-operation and Development, 1999; Office of Review and Evaluation, 2002; Thomas 2002; Kumar 2003) that past and present approaches to aid have not had the success necessary to alleviate poverty.
Changes to engineering practice that will enhance SL approaches have been identified (Hyden, 1998; Ashley and Carney, 1999; Harpman and Anelay, 1999; Sustainable Livelihoods Unit, 1999; Hobley, 2000; Organisation for Economic Co-operation and Development, 2001; Pasteur 2002; Satterthwaite 2002):

- longer-term, more flexible programmes (and corresponding budgets and timelines), with wider community and donor participation and partnerships at all stages of the programme;
- broader development objectives;
- bottom-up approach for capacity building; top-down accountability and transparency;
- macro-micro links (between policy makers and the community); and
- greater skills diversity.

The development sector is characterised by ill-defined and complex problems due to uncertainty, instability, non-transferability and different rates of change in the surrounding environment (Edwards, 1997; Sanga and Nally, 2002; Hodge, Hardi et al., 1999). Further, using the SL approach introduces more complexity through its multidisciplinary approach to development. The success of soft systems methodologies (SSM) in such complex environments has been examined by several authors (Rose, 1997; Callo and Packham, 1999; Hodge, Hardi et al., 1999; Chen and Clothier, 2003), and.

SSM has been developed by Checkland and Scholes (1999) over more than 30 years to deal with complex problem situations that are ill-structured and defined differently by people in the situation.
Three phases help to define the process of SSM (Lane and Oliva 1998). These phases can run concurrently, can interact and provide feedback to each phase.
The first stage is to define the problem. SSM acknowledges and incorporates the impact that the social, cultural, institutional, historical and political environment surrounding the real world problem and its "would-be improvers".
The second phase consists of building models to represent the human activity systems. SSM explores the different perspectives that are held regarding the problem situation by a variety of users.
The comparison of these models with perceived reality verifies their accuracy and helps to identify areas of possible change. The final phase consists of using the model in the problem situation, which, in the iterative nature of SSM, may help to define more relevant systems, or alternatively, identify accommodations or changes to improve the problem situation. The process of exploration through SSM results in inherently "systemically desirable" changes. Further investigations of the changes in the broader context of the system ensure that they are culturally appropriate or feasible.

(b) Please attach a list of references used in the literature review and cited in your application.

Ashley, C. and D. Carney (1999). Sustainable Livelihoods: Lessons from early experience. London, Department for International Development.

Callo, V. N. and R. G. Packham (1999). "The Use of Soft Systems Methodology in Emancipatory Development." Systems Research and Behavioral Science 16: 311-319.

Chambers, R. and G. R. Conway (1992). Sustainable rural livelihoods: practical concepts for the 21st century. IDS Discussion Paper 296. London, Institute of Development Studies.

Checkland, P. and J. Scholes (1999). Soft Systems Methodology in Action. Brisbane, Australia, John Wiley and Sons, Ltd.

Chen, P. and J. Clothier (2003). "Advanced Systems Engineering for Systems-of-Systems Challenges." Systems Engineering 6: 170-183.

DFID (2001). Sustainable Livelihoods Guidance Sheets. London, UK, Department for International Development.

Edwards, M. (1997). "Organizational learning in non-governmental organizations: What have we learnt?" Public Administration and Development 17: 235-250.

Farrington, J. (2001). Sustainable Livelihoods, Rights and the New Architecture of Aid. Natural Resource perspectives Number 69. London, Overseas Development Institute.

Harpman, T. and L. Anelay (1999). "After Roads and Dams: What Role for Engineers in the Poverty Reduction Strategies of Bilateral Development Agencies?" Journal of International Development 11: 811-823.

Hobley, M (2000). "Organisational Change and Sustainable Livelihoods: What is the Relevance?"

Hodge, R. A., P. Hardi, et al. (1999). Seeing Change through the Lens of Sustainability. Beyond Delusion: Science and Policy Dialogue on Designing Effective Indicators of Sustainable Development, Costa Rica, International Institute for Sustainable Development.

Hyden, G. (1998). Governance for Sustainable Livelihoods: Operational Issues. SL Strategy Papers. New York, United Nations Development Programme.

Kumar, N. (2003). Community-Driven Development: Lessons from the Sahel. An Analytical Review. Washington, D.C., The World Bank.

Lane, D. C. and R. Oliva (1998). "Theory and Methodology. The greater whole: Towards a synthesis of systems dynamics and soft systems methodology." European Journal of Operational Research 107: 214-235.

Office of Review and Evaluation (2002). Sectors and Themes: Emerging Issues. Review & Evaluation Summary Report 1 April – 31 December 2001. Canberra, Australia, AusAID.

Organisation for Economic Co-operation and Development (1999). DAC Scoping Study of Donor Poverty Reduction Policies and Practices. London, Overseas Development Institute.

Organisation for Economic Co-operation and Development (2001). The DAC Guidelines. Poverty Reduction. International Development. Paris, OECD.

Pasteur, K (2002). Changing Organisations for Sustainable Livelihoods: A Map to Guide Change. Institute of Development Studies.

Rose, J. (1997). "Soft Systems Methodology as a Social Science Research Tool." Systems Research and Behavioral Science 14(4): 249-258.

Sanga, K. and T. Nally (2002). Rethinking Development Practice. DevNet Conference 2002. Contesting Development: Pathways to Better Practice, Massey University, Palmerston North, New Zealand.

Satterthwaite, D (2002). Reducing Urban Poverty; Some Lessons from Experience. Series Working Paper 11. London, UK, Human Settlements Programme, International Institute for Environment and Development.

Solesbury, W. (2003). Sustainable Livelihoods: A Case Study of the Evolution of DFID Policy. Working Paper 217. London, Overseas Development Institute.

Sustainable Livelihoods Unit, Bureau for Development Policy (1999). Towards a Technology Strategy for Sustainable Livelihoods. DRAFT. New York, UNDP.

Thomas, P. (2002). Development Project Design. Towards Better Practice. DevNet Conference 2002. Contesting Development: Pathways to Better Practice, Massey University, Palmerston North, New Zealand.

World Bank (1998). Assessing aid - What works, what doesn't, and why. A world bank policy research report. New York, Published for the World Bank by Oxford University Press.

SECTION II – RESEARCH PARTICIPANTS

In line with the National Statement, the definition of participants includes not only those humans who are the primary focus of the research but also those who will be affected by the research. The Committee regards the principle of respect for persons as of paramount importance.

3. Recruitment of research subjects/participants

(a) How do you propose to select and contact your subjects/participants?

A scoping study will be carried out to identify participants from within IDS-Nepal who are actively involved in the delivery of projects through SLA. Participants will be representative of the gender and skills balance within IDS-Nepal.

(b) How many subjects/participants do you intend to recruit? Explain why you have chosen this number.

The scoping study will identify the number of participants, depending on the range of issues uncovered. It is estimated that approximately five participants will be recruited.

4. HOW WILL RESEARCH SUBJECTS/PARTICIPANTS BE AFFECTED?

In order to consider your research, the Committee will need to know what it will involve for your participants.

(a) What procedures does participation in this research involve for your subject/participants?

A brief workshop will be held with all IDS-Nepal staff to introduce them to the research and requirements of involvement. This workshop will define the roles required of the participants external to their existing role within IDS-Nepal. The bulk of data will be collected through working with and observing IDS-Nepal staff in their day-to-day practices. Additional data will be gathered through workshops, focus groups, formal and informal interviews. A schedule of workshops above the normal role of IDS-Nepal participants has been developed and will be distributed amongst participants. Surveys may be used if power or gender issues interfere with obtaining accurate information through the above procedures.

The data being collected will involve information regarding the following:

- IDS-Nepal assets (financial, physical, human, social and natural);
- vulnerability context including political, natural and human trends, seasonalities and shocks;
- IDS-Nepal's outcomes and strategies; and
- IDS-Nepal's processes, norms and cultures and policies.

(b) What time commitment does the research involve for your subject/participants?

Most research will be conducted through usual work practices, and therefore little additional time will be required from participants. A maximum of 10 half-day workshops above the normal roles of IDS-Nepal participants will be undertaken with IDS-Nepal participants over one year.

(c) Where will the research take place?

All research will be conducted at the participants' usual place of work.

(d) What travel, if any, does the research involve for your subject/participants?

The participants will not be required to travel.

(e) Please include any additional information you feel relevant.

-

5. RISK/HARM

Risk or harm could be described as damage or hurt to the well-being, interests or welfare of an individual, institution or group. Harm could range from physical hurt or damage such as illness or injury, to psychological or emotional hurt or damage, such as embarrassment or distress.

(a) Describe any risk or harm that research participants might experience while participating in the research.

Risk may involve power or gender imbalances, leading to coercion to participate, inappropriate data-collection methods or inaccurate data.

(b) Is there any possibility of risk or harm resulting from the research at any time in the future? If yes, please describe.

No. The research will not affect the roles of any participants, either between staff and employer, or between IDS-Nepal and AusAID. The research is merely a case study to illustrate the changes that one engineering NGO has gone through. Further, due to the participatory nature, the research will indicate changes to the structures and process of IDS-Nepal that will help in the delivery of projects through Sustainable Livelihoods. These changes will be identified and initiated by IDS-Nepal and its staff only. The role of the researcher will not affect the nature or delivery of changes in any way.

(c) Describe how you propose to minimise **<u>any</u>** risk for subjects/participants.

Research will be carried out under the participants' usual roles in their usual environments to minimise risk. Participatory research methods will be used to ensure accuracy of data. The researcher will be a facilitator only, a role which will encourage capacity-building to minimise biases. Should power or gender issues arise, surveys will be used to collect data.

A memorandum of understanding (MoU) will be developed with IDS-Nepal clarifying confidentiality issues with regard to publications, staff interviews, workshops and access to IDS-Nepal records. Additionally, the MoU will address the researcher's relationship with external stakeholders.

Consent forms will be signed by both IDS-Nepal. Confidentiality will be maintained if participants do not wish to be identified in reports/publications. If confidentiality is requested, a consent form will not be signed, rather a MoU detailing risks and contact details will be provided.

6. BENEFITS/PAYMENT

Researchers sometimes acknowledge the value of the input of participants by offering them rewards or benefits. Such benefits must not constitute an undue or improper inducement. Benefits may be financial or can take other forms. For example, movie tickets, book vouchers, chocolates, sharing the findings, or recompense for out-of-pocket expenses are all acceptable, whereas linking participation to assessment for students would not be acceptable.

Describe and justify any benefit, payment or compensation the participants will receive.

All findings will be shared with participants, which is part of the capacity-building process. Additionally, participants will be given the chance to co-author journal articles, which also helps with capacity-building. Workshops that are additional to participants' usual roles will incorporate refreshments supplied by the researcher.

7. DECEPTION

Whenever possible, research should be free of any deception of participants. If you believe that deception is necessary for the integrity of your research, please present a sound rationale.

(a) Does this research involve any deception of participants? If yes, please describe. If not, go to the next question (8).

No

(b) If yes, why is such deception necessary?

-

(c) How and when do you intend to debrief the participants if deception has been used?

-

8. PRE-EXISTING RELATIONSHIP TO RESEARCH SUBJECTS/PARTICIPANTS

Researchers sometimes assume that it will be easier to conduct research with participants they know, such as in the workplace, with family or friends. In fact, the reverse can be true and unexpected problems arise precisely because of the pre-existing relationship. For example, it is harder for participants to refuse or to withdraw from research when they know the researcher, which means that the research could be unintentionally coercive.

(a) Do you have an existing relationship to the research subjects/participants (e.g. employer/employee, colleague, friend, relation, student/teacher, etc)? If yes, please describe your relationship. If no, go to question 9.

No.

(b) Could student assessment, employee security, etc., be affected by participation in this research? Please give details.

-

(c) How might this relationship influence their decision to participate or create potential ethical conflict? Please describe your strategy for dealing with this.

-

(d) How might this relationship be affected by the proposed research or create potential ethical conflict? Please describe your strategy for dealing with this.

-

9. CONSENT

Informed consent is central to ethical research. It is an ongoing process, not just a signed form. The Committee recognises that it is not always possible or necessary to obtain formal or written consent, for example in anonymous or observational research, or the use of de-identified data in epidemiological research.

(a) Are you obtaining consent? If no, explain why. If yes, explain how.

Yes, consent will be obtained through the consent form attached. Additionally, a memorandum of understanding will be developed with IDS-Nepal in the planning stages of the study.

In some instances there might be particular issues in obtaining consent, for example in research involving people with dementia, prisoners, subordinates, etc.

(b) Please describe any special issues relating to consent in your research. Are the participants able to consent fully? Please give details. (Note: research involving children is dealt with in the next question.)

Consent agreements will be sought at both an institutional and personal level in order to ensure that individuals are free of coercive influences. A consent form will be signed by the Chairman of IDS-Nepal, as a representative of IDS-Nepal. Individual participants will be free to choose to participate and will be informed through an information sheet, distributed in the initial workshop.

10. CHILDREN

Research involving children and young persons under the age of 18 years raises special issues and considerations. If your research does involve children, you are advised to discuss your application with the Research Ethics Officer beforehand. Adults in any employment that involves direct contact with children are subject to the Child Protection Legislation and the Working With Children Check. The University has specific guidelines which will be accessible on the university's web page. In addition, researchers should familiarise themselves with the guidelines published by the Commission for Children and Young People http://www.kids.nsw.gov.au/check/ and the Child Protection Legislation, which can be viewed at the following web site: http://www.austlii.edu.au/au/legis/nsw/consol_act/

*(a) Does this research involve children? If no, please proceed to question 11. If yes, then you **must** answer all of the following questions:*

No

*(b) How will you obtain consent from **both** children and their parents, and any other stakeholder?*

-

(c) The HREC recommends that, when conducting research with children, a third person is present. If for any reason this is not your intention, please explain.

-

(d) Have you lodged a completed Prohibited Employee Declaration and the Working With Children Check form with your Faculty?

11. LANGUAGE & CULTURAL CONSIDERATIONS

Research involving people from identifiable language and cultural groups, including your own, may require special sensitivity. If the research is being carried out in another country, you must comply with UTS as well as local standards, laws and guidelines.

(a) Does your research focus on a specific language or cultural group? If yes, please give details. If no, please proceed to question 12.

Whilst the study is being undertaken in Nepal, specific participants are not delineated by language or culture. Involvement is defined, rather, by their role in the development sector.

(b) What steps will you take to accommodate the perceived needs of this group (e.g. translation of forms, use of a translator or interpreter)?

As English is the working language in IDS-Nepal, all full-time staff are fluent in written and spoken English. In the event that there are part-time staff whose English is not sufficient, professional translators/interpreters are available and their services will be used when required. Confidentiality agreements will be signed by any translators/interpreters used. The information sheet will be translated into Nepali.

(c) How have you sought approval from the community or group involved?

A memorandum of understanding will be developed with IDS-Nepal and consent forms will be signed by IDS-Nepal.

(d) Was the research generated from within the community or group?

Yes, the research was generated from within IDS-Nepal. IDS-Nepal identified the need for further investigations into the SL approach, and developed the volunteer placement with UTS.

(e) How might the community or group be affected by this research?

This research will help the development sector, in particular, IDS-Nepal to develop institutional structures and processes aligned to the approach of SL.

(f) If the research is taking place in another country, the Committee recommends that you arrange for a local, independent contact person, to make it easier for your participants should they wish to confirm your identity or express any concerns. Please explain whether or not this is appropriate for your research, and give details.

As a requirement of the AusAID programme, I will be in contact with an In-Country Manager through CECI Asia. This In-Country Manager will assist with any cultural issues that I have while I am away, and will be able to confirm my identity and role in Nepal. The In-Country Manager will also assist with a cultural and language orientation on arrival in Nepal. The details of the In-Country Manager are as follows:
Geetika Basnet – Country Representative
CECI – Asia
GPO Box 2959,
Baluwatar, Kathmandu, Nepal
Tel: + 977 1 4414430/419412
Mobile: + 977 1 4413256
geetikab@ceci.org.np

12. INVOLVEMENT OF ANOTHER INSTITUTION

If your research involves another institution, you may need to obtain additional appropriate consent or even formal approval. Some institutions may be satisfied to abide by UTS ethics approval. Other institutions may require another level of approval.

The NSW Department of Education and Training (DET), for example, has particular requirements relating to the conduct of research in schools. If your research involves DET, you are advised to contact their Strategic Research Directorate on (02) 9561 8878 or (02) 9561 8822. Their web site is: http://www.det.nsw.edu.au/aboutus/index.htm

(a) Does this research involve another institution (e.g. school, university, organisation, hospital, nursing home etc?) If yes, give details. If no, proceed to next section.

Yes. This research involves Integrated Development Society (IDS)-Nepal.

(b) How have you sought appropriate approval from the institution(s) involved? If not, please explain why this has not been done.

A memorandum of understanding will be developed with IDS-Nepal on arrival in-country (see section 5).

SECTION III - DATA

The collection, storage and use of data involves important considerations of privacy. When collecting data, researchers should show due sensitivity and respect for persons. It is also important that data be reliable, authentic, and where appropriate, replicable.

This section will provide the Committee with information as to how you intend to deal with these issues.

13. DATA COLLECTION

(a) Who will collect the data? (more than one box may be checked – to check, double click on box and follow the menu instructions.)

☒ self (researcher)
☐ research assistant
☐ volunteers
☐ paid collectors (other than research assistant)
☐ students (see note below)
☐ other (please describe)

Note Researchers need to ensure that if students are to be used to collect data for the academic's research purposes as part of class or course activity, it is done fairly and without any possibility of pressure or perception of undue influence.

Therefore, if you wish to use students to collect research data for your own research purposes, you must ensure that:

- *students are given a choice as to whether or not to participate and have their data used*
- *students' assessment is not related to their participation in this research*
- *students are presented with an equally available alternative activity which provides the same academic credit*
- *the work of students is acknowledged in any outcome (e.g. cited in any publication)*

- *participants are made aware of the use to which the data will be put (i.e. that it will be used for purposes in addition to its function as a student assignment)*

(b) How will the data be collected? *(More than one box may be checked.)*

☒ survey/questionnaire
☒ interview
☒ focus group
☐ covert observation
☒ participant observation
☐ telephone phone survey
☐ psychological testing/questionnaire
☐ physiological/medical testing/assessment
☐ audio/video recording
☒ access to records (see below in question 14)
☐ other (please describe)

(c) Have you attached a sample of your measurement instrument(s), e.g. survey, interview format, etc? If you are still developing your measurement instrument(s) (e.g. questionnaire, interview schedule), please give as much information as you can at this point (e.g. outline of questions).

Measurement instruments have not been developed. Due to the participatory and changing nature of the research, the direction of workshops will be developed by participants, reflecting importance as identified by them. *The research will identify the following dimensions of IDS-Nepal in its existing capacity, and will aim to compare them to the same dimensions that would further enhance the delivery of projects under the SL approach:* *- vulnerability context, including external trends, shocks and seasonalities;* *- assets, including physical, financial, social, human and natural;* *- livelihood outcomes and strategies; and* *- policies, institutions and processes.*

(d) If you are still developing your questionnaire/measurement instrument(s), w*hen will you be able to provide a final copy to the HREC?*

-

14. INFORMATION DATABASE OR PERSONAL RECORDS

(a) Does your data include access to an information database or personal records? If yes, please detail. If no, please proceed to question 15.

Yes, I will be reviewing IDS-Nepal's previous strategy, proposals and project reports.

(b) How will you obtain institutional approval for access to the data/base or personal records?

A memorandum of understanding with regard to access and confidentiality of these records will be developed between IDS-Nepal and the researcher.

(c) Will you be seeking information from a Commonwealth agency? If yes, please give details, including the number and type of records you intend to access .

No

(d) Does your research involve access to student records at this University? If yes, please refer to: http://www.uts.edu.au/div/publications/policies/select/privsr.html and indicate how you will follow this protocol.

No

15. DATA INTERPRETATION AND ANALYSIS

(a) Regardless of whether data collected is qualitative or quantitative, how do you plan to transform these data into material that is valid and reliable? For example, from tape recording to transcript, from questionnaire response to tabular form, etc.

All data collected will be qualitative. Workshop minutes will be transferred to electronic and hardcopy transcript, as will questionnaire responses.

(b) How will you analyse or interpret your transformed data, whether qualitative or quantitative? For example, explain how will you understand /uncover relationships, or your reasons for using particular statistical test(s).

This research is an individual case study of change within an organisation. Qualitative data only will be collected, representing a range of views. Soft systems methodologies will be used to develop models of existing and ideal systems and to compare the changes required. These methodologies will be used in participatory workshops with IDS-Nepal staff and verified by IDS-Nepal staff.

16. DATA STORAGE

Data must be stored and secured for a minimum of 5 years after publication. The data should be stored so as to ensure maximum privacy for participants, reliability and retrievability of data.

(a) How will the data be stored?

- ☒ electronically – hard disc
- ☐ electronically – soft disc
- ☒ electronically – backed up
- ☐ microfilm
- ☐ paper questionnaires/surveys
- ☐ video-tapes
- ☐ audio-tapes
- ☐ transcripts of audio-tapes
- ☐ handwritten notes
- ☐ coded data
- ☐ confidential but potentially identifiable data
- ☐ non-identifiable (anonymous) data
- ☐ other (describe)

(b) Who will have access to the data?

Personal surveys, interviews and the results of participant observations will be kept confidential and access will only be granted to those individual subjects. Records of focus-group discussions will only be accessible by those involved in the focus group. Access to transcripts from records will be limited to access nominally applied to those records by the record owners.

17. PUBLICATION OF DATA

How do you intend to publish the data?

- ☒ thesis
- ☒ journal articles
- ☐ media
- ☒ conference paper
- ☐ book
- ☐ electronic publication
- ☐ other (please give details)

18. PRIVACY AND CONFIDENTIALITY

As a general principle, privacy and confidentiality should be respected at all stages of the research (with raw data, processed, published or archived), and by all those involved in the research (including the researcher, research assistants, administrative assistants, students, interpreters, translators, data processors, members of focus groups, etc.)

Note: Privacy and confidentiality is complicated in NSW because it is governed by a number of separate Acts:

- ***the Privacy Act 1988 (Commonwealth)***
- ***the Privacy and Personal Information Protection Act 1998 (NSW)***
- ***the State Records Act 1998 (NSW)***

The following Privacy Principles apply to all research conducted by staff and students of this University:

1) *Restricting collection of information to lawful purposes and by fair means*
2) *Informing people why information is collected*
3) *Ensuring personal information collected is of good quality and not too intrusive*
4) *Ensuring proper security of personal information*
5) *Allowing people to know what personal information is collected and why*
6) *Allowing people access to their own records*
7) *Ensuring that personal information stored is of good quality, including allowing people to obtain corrections where it is not*
8) *Ensuring that personal information is of good quality before using it*
9) *Ensuring that personal information is relevant before using it*
10) *Limiting the use of personal information to the purposes for which it was collected*
11) *Preventing the disclosure of personal information outside the agency*

(a) Will this research be undertaken in conformity to **ALL** the above Privacy Principles? If not, please explain.

Yes

(b) How will you ensure the security of the data?

Data will be verified by all participants before use, and through the collection of secondary data. The data will be stored electronically on the researcher's computer only. A back-up copy will be stored on CD, which will be used for all analysis.

(c) How will you *protect* the confidentiality/privacy of your participants? (For example, will the data be de-identified and the codes stored separately?)

Participants will be identified only by their role in IDS-Nepal, not by their name.

(d) To what extent will you or anyone else be able to *identify* the research subjects/participants from the published or unpublished data? Please describe.

The data will be collected to build capacity within IDS-Nepal in the external research/development sector, therefore the organisation's name will be published in all articles. This has been agreed upon with IDS-Nepal already. Individual participants' roles only will be published, not their names, as agreed on during the development of the project.

19. DISPOSAL OF DATA

You should give your participants a choice as to how the data will be ultimately disposed of, and this should be addressed in the consent form. For example oral histories could be archived for future reference.

(a) Will the data be archived or destroyed? If the data is to be destroyed, give a destruction date. (Please note that the AVCC Guidelines on the Storage of Data require that data be kept for a minimum of 5 years after publication of research.)

The data will be archived.

(b) If the data is to be archived, who will have access to it, and will there be any conditions attached?

Both the researcher and participants will have access to the data as discussed in section 16b. After verification of the data, no further changes will be made to the data. Data associated with the political nature of IDS-Nepal will only be accessible to those participants directly involved in this part of the research.

SECTION IV – ADDITIONAL ETHICAL ISSUES

20. OTHER ETHICAL ISSUES:

Are there any other ethical issues in relation to your research which you wish to comment upon? If yes, please describe.

Other ethical issues include possible exposure behaviour or practices outside normally acceptable practices, which may be deemed as corrupt by local standards. Advice will be sought from the CECI advisor before taking action with respect to what is culturally appropriate behaviour from locals and with respect to culturally appropriate means to approach these practices.

SECTION V - FINAL CHECKLIST

To ensure minimum delay in the consideration of your application, please indicate by ticking the appropriate boxes below that you have supplied the following:

I have attached the following supporting documents:	**Y**	**N/A**
• consent form/information letter(s)	☒	☐
• surveys/questionnaires/outline of questions	☐	☒
• translation of forms/information letter(s)/instruments	☐	☒
• approval from external institution/community group	☐	☒
• approval from Dean/Head of School to access students	☐	☒
• budget page from funding application	☐	☒
• explanations of any technical terms used	☐	☒
• letter of approval of candidature	☒	
• signed declaration(s)	☒	
• original & ***16*** copies of my application	☒	

DECLARATION

I declare that the information I have given above is true and that my research does not contravene the *National Statement on Ethical Conduct in Research Involving Humans* and the UTS policy and guidelines relating to the ethical conduct of research.

I also declare that I will respect the personality, rights, wishes, beliefs, consent and freedom of the individual subject in the conduct of my research and that I will notify the UTS Human Research Ethics Committee of any ethically relevant variation in this research.

_____ Date: ____/____/____
Supervisor

_____ Date: ____/____/____
Co-supervisor [where applicable]

_____ Date: ____/____/____
Student

Memorandum of Understanding

1. Project Description

This project is to investigate the characteristic changes within an engineering organisation as a result of adopting the Sustainable Livelihoods (SL) approach for the delivery of projects.

The research phase will take place within the researcher's role as an Australian Youth Ambassador for Development (AYAD) under AusAID, with Integrated Development Society-Nepal (IDS-Nepal). The data collection will take place from May 2004 to October 2004.

2. Scope of Work

2.1. Researcher's Role

The researcher's role will be carried out through her position as a projects engineer with IDS Nepal. This position will not be compromised as a result of the research. Workshops will be held on a minimal number of occasions to clarify/verify data collected [as per the attached Methodology].

2.2. IDS Nepal's Role

Participation in the research will be carried out as part of IDS-Nepal staff's existing roles. A minimal number of workshops, outside the normal functions of IDS-Nepal, will be carried out throughout the year. These workshops will develop IDS-Nepal's capacity in the SL approach.

8.1.1.1. 2.2.1 Time and Location of Commitment

Participation in the research will be during normal IDS-Nepal working hours and will occur in the same location of the staff's usual role within IDS-Nepal. This may be in the office, in Baluwatar, Kathmandu, or in various field locations across Nepal. There will not be any additional travel required outside of participants' usual travel for IDS-Nepal.

8.1.1.2. 2.2.2 Financial Commitment

No financial commitment will be expected from IDS-Nepal for the support of this research. Workshops directly related to this research will be funded by the researcher.

3. Research Methods

A detailed version of the research methodology may be viewed at any time. This can be obtained from Helen Salvestrin.

4. Confidentiality

4.1. IDS-Nepal's Records

8.1.1.3. 4.2.1 Access

The researcher will have open access to all IDS-Nepal records and documents.

8.1.1.4. 4.2.2 Confidentiality

The content of IDS-Nepal records and documents may be used throughout the research.

4.2. Publications/Conference Proceedings

IDS-Nepal's staff roles may be made known in any publications/conference papers written as a result of the research.

4.3. Authorship

Authorship of publications/conference papers written as a direct result of the research at IDS-Nepal will be authored jointly with the appropriate IDS-Nepal staff and will be correspondingly acknowledged.

4.4. Consent

An introductory workshop will be held to inform IDS-Nepal staff of the research and what would be involved. As a part of each staff members's commitment to IDS-Nepal, their participation in this research is strongly desired. The Chairman of IDS-Nepal will sign a consent form on behalf of all IDS-Nepal staff.

4.5. Right to Refuse/Terminate Participation

Participation in research by IDS-Nepal and individuals is not compulsory. In no way will lack of participation in this research affect IDS-Nepal's association with AusAID. Additionally, IDS-Nepal and individual staff members are free to terminate their involvement with this research at any stage.

5. Relationship with External Stakeholders

In the event of research work involving external stakeholders the researcher's relationship with IDS-Nepal may be made known.

6. Distribution of Research Findings

Personal surveys, interviews and the results of participant observations will be kept confidential and access will only be granted to those individual subjects. Records of focus-group discussions will only be accessible by those involved in the focus group. Access to transcripts from records will be limited to access nominally applied to those records by the record owners.

7. Contact Details

The researcher may be contacted as below:
Helen Salvestrin
CECI – Asia
GPO Box 2959,
Baluwatar, Kathmandu, Nepal
Tel: +977 1 4414430/4419412
helensal@eng.uts.edu.au

The researcher's supervisor may also be contacted as below:
Dr Andrew Mears
Room 32, Building 1, Level 24
Faculty of Engineering,
University of Technology, Sydney
PO Box 123, Broadway, NSW, 2007, Australia
Tel: +61 2 95142427
Andrew.mears@eng.uts.edu.au

Additionally, AusAID's In-Country Manager may be contacted to verify the authenticity of the research or the researcher. Contact details follow:
Geetika Basnet – Country Representative
CECI – Asia
GPO Box 2959,
Baluwatar, Kathmandu, Nepal
Tel: +977 1 414430/419412
Mobile: +977 1 413256
geetikab@ceci.org.nep

IDS-Nepal may be contacted as below:
Dinesh C. Devkota – Chairman
IDS-Nepal
PO Box 6413,
Maharajgung, Kathmandu, Nepal
Tel: +977 1 4427329
idsnepal@wlink.com.np

Signature:	Signature:
Chairman, IDS Nepal	Helen Salvestrin
Date:	Date:

This Memorandum of Understanding will be in force for twelve (12) months, unless otherwise noted.

UNIVERSITY OF TECHNOLOGY, SYDNEY

STUDENT RESEARCH

I _____ agree to participate in the research project *"Sustainable Livelihoods and Development in Engineering"* being conducted by Helen Salvestrin, of University of Technology Sydney, for the purpose of her Master of Engineering research degree. Helen is contactable through Geetika Basnet at CECI at the following address:

GPO Box 2959,
Baluwatar, Kathmandu, Nepal
Tel: 977 1 4414430/4419412
Mobile: [redacted]

I understand that the purpose of this study is to investigate the organisational changes involved in using the Sustainable Livelihoods approach in engineering.

I understand that my participation in this research will be mostly through my existing role in IDS-Nepal. Additional workshops and interviews will be undertaken through the course of my normal role with IDS-Nepal. I understand that the progress of this research will not affect my role with IDS-Nepal or IDS-Nepal's relationship with AusAID.

I am aware that I can contact Helen Salvestrin or her supervisor Andrew Mears if I have any concerns about the research. I also understand that I am free to withdraw my participation from this research project at any time I wish and without giving a reason. This will not affect relations between IDS-Nepal and AusAID or its partner organisation, the University of Technology, Sydney.

I agree that Helen Salvestrin has answered all my questions fully and clearly.
I agree that the research data gathered from this project may be published.

_____ ____/____/____
Signed by

_____ ____/____/____
Witnessed by

NOTE:
This study has been approved by the University of Technology, Sydney Human Research Ethics Committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the Ethics Committee through the Research Ethics Officer, Ms Susanna Davis (ph: +61 2 9514 1279, Susanna.Davis@uts.edu.au). Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

Information Sheet
Sustainable Livelihoods and Development in Engineering

The research project "*Sustainable Livelihoods and Development in Engineering*" is being conducted by Helen Salvestrin of the University of Technology, Sydney, for the purpose of her Master of Engineering (research) degree. Helen is contactable through Geetika Basnet at CECI Asia at the following address:

GPO Box 2959,
Baluwatar, Kathmandu, Nepal
Tel: 977 1 4414430/4419412
Mobile:
geetikab@ceci.org.np
helensal@eng.uts.edu.au

The purpose of this study is to investigate the organisational changes involved in using the Sustainable Livelihoods approach in engineering. The data being collected will involve information regarding the following:

- IDS-Nepal's assets (financial, physical, human, social and natural);
- IDS-Nepal's vulnerability context including political, natural and human trends, seasonalities and shocks;
- IDS-Nepal's outcomes and strategies; and
- IDS-Nepal's processes, norms and cultures and policies.

Participation in this research will be mostly through existing roles in IDS-Nepal. Additional workshops and interviews will be undertaken through the course of normal roles with IDS-Nepal. The progress of this research will not affect existing roles with IDS-Nepal. Participation is voluntary, and is able to be withdrawn at any time, without giving a reason.

In the event of any concerns regarding this research, Helen Salvestrin or her supervisor Andrew Mears can be contacted as above, or at the following address:

Andrew Mears
Room 32, Building 1, Level 24
Faculty of Engineering
University of Technology, Sydney
PO Box 123, Broadway, NSW 2007
Tel: +61 2 9514 2427
Andrew.Mears@eng.uts.edu.au

AMENDMENT TO APPLICATION FOR APPROVAL (STUDENTS)

UTS HUMAN RESEARCH ETHICS COMMITTEE 2004-041

Project title: Sustainable Livelihoods (SL) approach and development in engineering institutions

Research design: The research will now include other organisations similar to Integrated Development Society (IDS)-Nepal. That is, engineering type non-government organisations (NGOs).

Recruitment of research subjects/participants: These organisations will be identified through interactions with IDS-Nepal, that is, through IDS-Nepal's projects and their partners.

Approximately 50 external participants will be recruited. This number will be sufficient to represent a range of engineering NGOs in Nepal that are currently working within the SL framework. It also includes a sufficient number of engineering NGOs that are not working within the framework, to demonstrate baseline processes.

How will research subjects/participants be affected? This research will include focus groups, questionnaires and interviews regarding the organisational change processes undertaken in order to conduct engineering projects through the SL framework.

The research will require a maximum of one-week's commitment over a period of three months from the participants.

The research will be conducted at the participants' usual work places, and therefore does not require any additional travel.

Risk/harm: Risk may involve power or gender imbalances, leading to coercion to participate, inappropriate data collection methods or inaccurate data.

The research will not affect the roles of any participants, either between staff and employer, or between IDS-Nepal and the NGO. Due to the participatory nature, the research will indicate changes to the structures and process of the NGO that will help in the delivery of projects through Sustainable Livelihoods. These changes will be identified and initiated by the NGO and its staff only.

Research will be carried out under the participants' usual roles in their usual environments to minimise risk. Participatory research methods will be used to ensure accuracy of data. The researcher will be a facilitator only, a role which will encourage capacity-building to minimise biases. Should power or gender issues arise, surveys will be used to collect data.

Consent forms will be signed by all participants. Confidentiality will be maintained if participants do not wish to be identified in reports/publications. If confidentiality is requested, a consent form will not be signed, rather an Information Sheet detailing risks and contact details will be provided and any identifying questions, such as name and organisation will be removed from questionnaires.

Benefits/payments: All findings will be shared with participants, which is part of the capacity-building process. Additionally, the research will provide a basis for the further Sustainable Livelihoods training, reflective of the needs of the research participants.

Consent: Participation is voluntary. Participants will be briefed regarding the scope of the research and, if willing to participate, a consent form will be signed.

Language/cultural considerations: Whilst the study is being undertaken in Nepal, specific participants are not delineated by language or culture. Involvement is defined, rather, by their role in the development sector.

Questionnaires will be translated into Nepali. Translators will be used for surveys and focus groups. Translators will be required to sign confidentiality agreements.

The research was not generated from within the group.

Involvement of another institution: This research involves engineering NGOs in Nepal. Consent will be sought from each participant.

Data collection: Focus-group questions and questionnaires for external organisations have been attached.

Dear Jane,

With regard to the comments from the ethics application for "Sustainable Livelihoods Approach and Development in Engineering Institutions" (UTS HREC 2004-041), the application has been amended and is attached. In summary, the following changes have been made to address the committee's concerns:

1. An information sheet has been prepared and attached, explaining the individual's freedom to participate or withdraw at any time. Individual consent is central to the participatory approach taken in this project.
2. "Anonymity" was replaced where necessary with "Confidentiality" throughout the document.
3. The signed MoU is attached below. A hardcopy has been sent in the post.
4. Political data relates to the disposition and nature of power and the processes through which power is exercised, obtained, passed on and preserved. This data concerns senior management staff only.
5. The data to be collected includes:
    - IDS-Nepal's assets (financial, physical, human, social and natural);
    - IDS-Nepal's vulnerability context including political, natural and human trends, seasonalities and shocks;
    - IDS-Nepal's outcomes and strategies; and
    - IDS-Nepal's processes, norms and cultures and policies.

    This information has also been detailed in the information sheets.
6. The information sheet has been interpreted and translated into Nepali and is attached below.

Additionally, the data collection phase will start immediately upon receipt of ethics approval. The total amount of funding is a scholarship stipend of $23,848, plus AusAID project funding of $13,200 (to cover project and living expenses) and a return airfare.

I trust that these changes meet your requirements. Please let me know if you need further information.

Regards,

Helen Salvestrin
(For Andrew Mears)
Faculty of Engineering,
University of Technology Sydney
Australia

UNIVERSITY OF TECHNOLOGY SYDNEY

FINAL REPORT TO UTS HUMAN RESEARCH ETHICS COMMITTEE

This report is to be completed every twelve months following the date of ethics approval, and at the completion of your research project.

PROJECT TITLE:	Sustainable livelihoods approach and development in engineering institutions

Approval Number:	UTS HREC 2004-041A	**Date of Approval:**	14 May 2004

Is the project completed yet? Yes	**Date of Completion:**	**October 2004**

Position	**Name** (include title)	**Contact number**	**Email**	**Period of involvement**
Supervisor	Dr Prasanthi Hagare		p.hagare@eng.uts.edu.au	Duration of the research
Co-supervisor	Dr Andrew Mears		andrew@majorityworld.com.au	Duration of the research
(Student)	Helen Salvestrin		helensal@eng.uts.edu.au	Duration of the research

Have there been any changes to your research project since ethics approval was granted?
(Note: major changes may require an amendment application form. Please contact the Ethics Secretariat on 02 9514 9615 if you are unsure). **Please outline and explain the reasons for any changes that have occurred in any of the following areas:**

(a) Participating investigators

(b) Procedures or methodology

Methodology was altered to include up to 50 additional participants from non-government organisations other than the one outlined in the original application, to provide a range of organisations, both those who were working and were not working with the sustainable livelihoods framework.

(c) Data collection instruments (surveys/questionnaires/interview questions)

(d) List the dates of approval of any amendment applications made prior to your last report

20/08/2004

Did any of the following events occur?
If yes, please give details of the event, and how it was resolved or addressed

(a) Unforeseen ethical or other difficulties during your research

No

(b) Adverse effects for your subjects /participants

No

(c) Complaints received from participants or other persons involved in the research

No

How and where have you stored the data you have collected?
Please give details (e.g., coded on computer, files, etc.)

Hard copies and electronic files.

What steps have you taken to ensure the confidentiality of your participants?
Please give details (e.g. disguised data, locked filing cabinet, limited access to information, etc.)

Participants were identified only by their role in IDS Nepal, not by their name. Files stored on non-networked computer with password.

Are you planning to publish or have you published the results of your research?
If yes, please give details and please attach a copy of any articles or abstracts.

Yes, paper presented at the Third South Asian Water Forum (held in Dhaka, Bangladesh 13-15 July, 2004): *"Moving towards Sustainable Livelihoods Approach for Poverty Reduction in Water and Sanitation Programmes in Nepal"* (Paper attached)

Additional Comments? **Please add any further information you feel may be relevant.**

DECLARATION

I declare that the information I have given above is true and that my research has contravened neither the *National Statement on Ethical Conduct in Research Involving Humans;* the *Joint NHMRC/AV-CC Statement and Guidelines on Research Practice;* the Commonwealth Privacy Act (1998); nor the UTS policy and guidelines relating to the ethical conduct of research.

I also declare that I have respected the personality, rights, wishes, beliefs, consent and freedom of the individual subject in the conduct of my research and that I have notified the UTS Human Research Ethics Committee of any ethically relevant variation in this research.

_____ Date: ____/____/____
Chief Investigator/Supervisor

_____ Date: ____/____/____
Student (if applicable)