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## Glossary

| | |
|---|---|
| AIC | Agricultural Inputs Corporation |
| APP | Agriculture Perspective Plan |
| AREP | Agricultural Research and Extension Project |
| CBO | Community-based organisation |
| CBS | Central Bureau of Statistics |
| CSRC | Community Self Reliance Centre |
| DADO | District Agricultural Development Office(r) |
| DFID | Department for International Development |
| DLS | Department of Livestock Services |
| DoA | Department of Agriculture |
| ECAPAPA | Eastern and Central Africa Programme for Agricultural Policy Analysis |
| FGD | Focus Group Discussion |
| FUG(s) | Forest user groups |
| FYM | Farmyard manure |
| GARDP | Gulmi and Arghakhanchi Rural Development Project |
| GDP | Gross Domestic Product |
| GO | Government organisation |
| HARP | Hill Agriculture Research Project |
| HMGN | His Majesty's Government of Nepal |
| ICIMOD | International Centre for Mountain Development |
| INGO | International non-government organisation |
| IPNM(S) | Integrated Plant Nutrient Management (System) |
| LI-BIRD | Local Initiatives for Biodiversity in Rural Development |
| LMS | Land Management Strategy |
| MoAC | Ministry of Agriculture and Cooperatives |
| MoFSC | Ministry of Forests and Soil Conservation |
| NARC | Nepal Agricultural Research Council |
| NEPAP | National Environmental Policy and Action Plan |
| NGO | Non-government organisation |
| NLUPP | National Land Use Planning Project |
| NPC | National Planning Commission |
| NRSP | Natural Resources Systems Programme |
| PFM | Participatory Farm Management |
| PRSP | Policy Reduction Strategy Paper |
| SALT | Sloping agricultural land technology |
| TORA | Theory of Reasoned Action |
| UNDP | United Nations Development Programme |
| VDC | Village Development Committee |

# 1 Introduction

## 1.1 Livelihoods and poverty in Nepal

Rural livelihoods in Nepal are still predominantly based on natural resources. Agriculture accounted for 41% of GDP in 1999 (WB 2000). UN (1999) reports that "an overwhelming majority" of the population still rely on subsistence farming to make a living. The World Bank (1997) estimated 50% of the population nationally to be below the poverty line in the mid-1990s. Income inequality has increased over the last decade (UN op.cit.).

Differentiation is stark between Districts. Poverty mapping by ICIMOD in the mid-1990s confirmed that the Far and Mid Western hills had a particularly high incidence of poverty (Sadeque 1998). The hills include 90% of food deficit districts (CBS 1999). Within hill districts, poverty is concentrated among those with smaller rainfed farms which do not produce enough to sustain the household for 12 months, little access to non-NR livelihoods, and poor infrastructure. Road development in the hills is increasing differentiation, with improved market access bringing new opportunities to some areas.

There are ethnic and gender dimensions to rural poverty. Much of the burden of land management at farm level falls on women and children, who cut and carry fodder and composting materials from public and community forest and tend livestock. DFID's Country Strategy Paper (1999) recognised that natural resource constraints are among the main causes of poverty, a view reiterated in the 2003 Country Assistance Paper's reference to the "fragile ecosystems" on which rural livelihoods depend (DFID 2004). The UNDP Poverty Report on Nepal (2000) concludes that the rural poor have low-productivity land, and that weak institutions and inadequate infrastructure restrict their access to credit, inputs and markets.

Human capital, measured in terms of literacy rates and formal education, is low in the mid-hills. Improvements in soil and land management, however, are complex and knowledge intensive, usually requiring local adaptation. Access to external sources of information is restricted. The strategy of relocating DADO (District Agricultural Development Office) field level extension staff to Agricultural Service Centres has reduced access particularly for women (Subedi and Garforth 1996). On the other hand, in areas with pluralistic extension provision equity of access is enhanced (Mulhall and Garforth 2000). Policies of service providers, and of government towards the private sector and NGOs, are therefore important factors in facilitating farmers' decision making on land management strategies. Change within service provider organisations is a pre-requisite for change in their relationships with users (Hobley and Shields 2000).

Population increase in the hills is leading to smaller farm sizes, and in some areas to farming on steeper slopes. However, generalisations are misleading: in other areas, rainfed plots are abandoned as people migrate or exploit alternative livelihood opportunities. Livestock and access to forest are crucial factors in current land management strategies, through the carrying of fodder to stall fed animals which produce manure. There are therefore important links between land management strategies at field and landscape levels. Decisions about the management of community forests, for example, affect the ability of households to maintain livestock. Collaboration between interest groups, a supportive policy environment and targeting of private and public resources to "pockets of poverty" (Sadeque op.cit.) are needed.

## 1.2 Land management research and policy making

By the end of the 1990s, a lot of research had been done in hillside environments in Nepal to address the issue of how farmers can improve the management of their land resources. This included studies based on long term trials relating to soil erosion and soil nutrient

management, as well as research on existing local knowledge and its distribution in both spatial and socio-economic terms. Concern had been expressed by research managers and development agencies that while the findings from these studies were having some impact among the farmers directly involved in the research or farming in the vicinity of the organizations carrying it out, wider uptake seemed to be limited. One reason for this, it was suggested, was that the findings of research were having relatively little impact on national policy towards agriculture and land management (NRSP 2000).

By the end of the 1990s, research funded by DFID in the mid-hills had identified socio-economic factors amenable to policy intervention that affect household decisions on land management in respect of agroforestry (Garforth et al. 1999: R6881); was developing tools for assessing soil fertility which combine biophysical and socio-economic parameters (R7536); had identified locally viable options for maintaining soil nutrient status (R6757 – Pilbeam et al. 1999) and had begun to draw out policy implications relating to credit, extension, information campaigns and input supply (Mathema et al. 1999); and was validating management strategies for community managed forests (R6918). Participatory action research had identified agroforestry practices which help control erosion and maintain fertility (Neupane 2000). Decision tools had been developed which facilitate location specific choices of fertility-enhancing intercrops (Keatinge et al. 1999) and subsequent studies (R7412) identified further viable soil and land management techniques. There are therefore research-based and farmer-developed technologies and strategies for improved land management which have been validated locally.

Turning to the policy dimension, UNDP (2000) suggested that in addressing poverty, HMGN had paid little attention to how "national policies can affect implementation of local projects, or how lessons from small-scale projects can help craft better national policies". A common conclusion from recent research on policy processes and participation in policy making is that institutions are required which facilitate dialogue among the various stakeholders (Holmes and Scoones 2000). Research in Kenya (Kinyanjui et al. 2000) concluded that participation by farmers and other stakeholders in policy formulation relating to soil and land management helps to build credibility and legitimacy for the policy that emerges. Sutton (1999) suggests that policy decisions in developing countries are often made on the basis of limited knowledge. Policy making frequently depends on generalisations from poorly interpreted statistics or on policy narratives that at once simplify complex realities and set an agenda for action. In the agricultural sector, practical knowledge of how sub-sectors function and respond to change is poor and there is a shortage of biophysical and socio-economic data. Attempts to improve decision support mechanisms incorporate two objectives: the transformation of available data into useful information and the management of information in order to maximize knowledge potential (Holt et al. 2002).

In Nepal, the Agriculture Perspective Plan (APP) provides a national policy framework for the agricultural sector. This is more concerned, however, with the development of niche commercial enterprises than dealing with poverty. Other initiatives, including the UNDP-supported Participatory District Development Programme, and the Local Governance Programme, emphasise social mobilisation and the strengthening of local government.

Policy making is not linear. It is interactive, iterative and continues even during implementation (Sutton 1999). While environmental and agricultural policy in Nepal are made at national level, implementation is through increasingly decentralised and pluralistic mechanisms. Village Development Committees have increasing responsibility – and resources – to address environmental concerns. Under the Agricultural Research and Extension Project (AREP), extension planning was reorientated to become based on local

priorities. In 2000, contracting out of public sector extension to private sector bodies began on a pilot basis (World Bank 2000).

Berkhout and Scoones (1999) proposed an inclusive and flexible policy process is needed, in which the "building of trust among key stakeholders" is an important element. Clarity of "messages" derived from credible science, and the reformulation of issues and problems to make them more comprehensible, are needed (ibid.). Policy making related to land use is diffuse: it goes on within a wide range of organisations (government, NGO, commercial – e.g. extension and research priorities and broadcasting policies) which impact on rural households' management decisions, as well as at a political level (e.g. on regulatory frameworks and macro-economic management).

Sutton (1999) proposed 21 factors supportive of policy change. Some relate to the quality of the information which informs the policy process, the research on which it is based and its presentation, others to the influence of well-informed, informal groups with close links to policy makers, and others to organisational structures and the openness to change of individuals within them. Single, local research findings are unlikely to provide the impetus for policy change. It is necessary to build "development narratives" (Sutton, ibid.) based on the accumulation of evidence. Local findings will have an impact on policy when they add weight to an emerging narrative.

### 1.3 Research objectives

The project set out to address two factors which are thought to impede wider scale impact of research outputs:

(a) the inherent complexity and contradictions of extending knowledge-intensive innovations, which are more often principles to be interpreted and adapted in local contexts than clear cut, precise recommendations;

(b) the apparent lack of influence of land management research so far on policy making, in two contexts: national agricultural and environmental policy making, and operational policy making of organisations providing services to rural land users and managers.

The study was designed to explore how linkages could be created between localized research and national policy processes. The purpose was defined at the outset as to find "ways to accelerate and upscale pilot research experiences to the wider community … through developing supportive policy environments for improving land management strategies" (project logframe). This was to be done by addressing three objectives. The first was to identify information and knowledge from recent and current land management research which could be applied on a wide scale. The second was to identify and promote constraints to uptake and adaptation of land resource management strategies which are amenable to policy intervention. Finally, the project was expected to identify, validate and promote sustainable processes for informing policy discussions at national level, within government policy making structures and organisations that provide support services to rural land users.

## 2 Methods

### 2.1 Identifying knowledge for wider uptake

Identifying relevant information and knowledge was addressed initially through a review of published and grey literature and discussions with research teams working on soil fertility, land management and scaling-up, including other NRSP projects. This was followed by field

validation in ten Village Development Councils (VDCs) in Parbat, Palpa, Myagdi, Tanahun and Chitawan Districts (Regmi et al. 2002)[1]. The rationale for the field validation was to understand farmers' and other local stakeholders' perceptions of the strategies identified from the literature and in particular on their inherent viability in specific agro-ecosystems. After initial discussions with officers in the District Agricultural Development Office to identify where specific technologies have been promoted and by which organisations, fieldwork was carried out at six locations where specific technologies or strategies had been developed or promoted with farmers ("intervention sites"), and then in six further locations which had broadly matching agro-ecological conditions to the six intervention sites to form an assessment of the potential for widespread uptake (Regmi et al. 2002: 5, Table 1). At each site, informal discussions were held with groups of male and female members of farming households. Wealth ranking was used to gain an insight in socio-economic differences in the use of technologies and farmers experiences with them. The strategies identified included fertility enhancement and maintenance through use of farmyard manure, composts and/or chemical fertiliser, use of legumes within crop rotations and modified sloping agricultural land technology (SALT).

ECAPAPA (Eastern and Central Africa Programme for Agricultural Policy Analysis) recognises that a key ingredient in informed policy formulation is knowledge of the economic returns to proposed changes in technology, from the perspective of the land users (ASARECA 1999). The project therefore intended to use participatory farm management (PFM) methods (Galpin et al. 2000) to explore farmers' perceptions of the returns to land management innovations, as an input to briefing papers for policy making dialogue. Because of the security situation in the country at the time, however, a more restricted set of methods was used in the fieldwork than originally intended. The main method used was discussions with focus groups established on the basis of gender and livelihood categories, backed up with transect walks or village tours and discussions with key informants including officers of the District Agricultural Development Office (DADO). In each intervention site, the focus groups identified factors which had facilitated or constrained the uptake of LMS; and in each non-intervention site, the research team assessed the similarity of socio-economic and agro-ecological parameters with the intervention sites and explored with farmers the reasons for adoption or non-adoption of improved LMS (Regmi et al. 2002). These ranged from lack of awareness of alternatives to current practice and strategy, to risk aversion and perceived lack of support from local government and line agencies (ibid.: 27).

## 2.2 Identifying constraints to uptake

The methodology to address the second objective was based on the Theory of Reasoned Action (TORA) (Ajzen and Fishbein 1980). TORA provides a framework and a methodology for exploring how behaviour is influenced by expectations and evaluation of the outcome and by perceptions of the attitudes of others. It has been used in natural resource management contexts to analyse factors influencing pest management decisions (McKemey and Sakyi-Dawson 2000) and adoption of energy strategies (Batchelor, McKemey and Sakyi-Dawson 1999), and to derive policy recommendations in situations of environmental vulnerability (McKemey, 1996). In the UK it has been used to explore farmers' attitudes and decisions in respect of pest management practices (Carr and Tait 1991) and the reasons behind livestock farmers' reactions to a set of research-based innovations (Garforth, Rehman et al. 2004).

[1] The methodology for this part of the research is described in Annex D (Regmi et al. 2002).

TORA hypothesises that the expressed intent to undertake a particular behaviour is the best predictor of actual behaviour[2]; that behavioural intention is dependent on two factors – attitudes and the subjective norm (which is essentially the social pressure felt by the individual to behave or not behave in a particular way); that attitudes depend on a combination of the individual's belief that a particular behaviour will lead to a particular set of outcomes and the values he or she attributes to those outcomes; and that subjective norms are a function of the individual's normative beliefs regarding how they feel 'important others' would expect them to behave, and their motivation to comply with these 'others' (Figure 1).

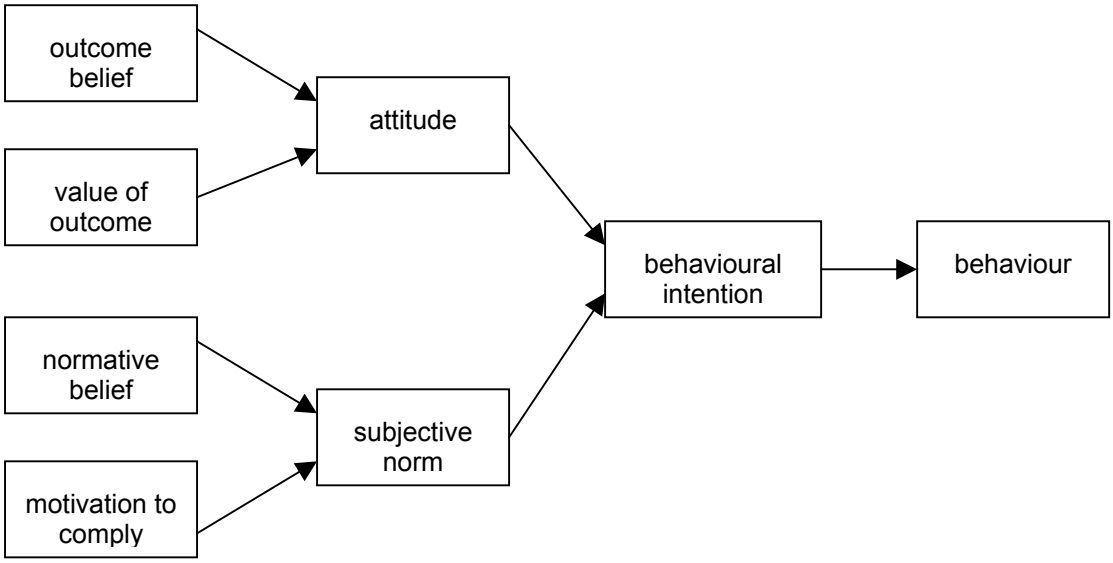


**Figure 1 Schematic presentation of the Theory of Reasoned Action**

The fieldwork element of the TORA methodology comprises two main steps (McKemey and Rehman 2002)[3]: qualitative field research based on semi-structured interviews and group discussion to elicit output beliefs and social referents, followed by a sample survey using a formal questionnaire to assign quantitative values to the separate constructs in the model. Correlation analysis shows the strength of relationships between the various constructs, enabling the identification of cognitive barriers and drivers towards the behaviour in question. The outputs of the analysis can then be used to plan information, advisory and policy interventions to address those factors which are most strongly associated with the performance or non-performance of the behaviours – in the present case, land management strategies and the specific technologies and practices through which they are expressed. The main purpose of using TORA in this project was not, however, to design information and advisory programmes for farmers, but to identify constraints and motivating influences which might be amenable to policy intervention.

The team carried out the qualitative phase of the fieldwork in November 2002 through interviews and discussions with 29 households in six villages, some in areas exposed to extension interventions relating to land management and some in areas without exposure, and

[2] However, where behaviour is not under "volitional control", a later refinement of TORA, the Theory of Planned Behaviour (TPB), is more appropriate (Ajzen 1988; Zubair and Garforth 2005).

[3] Annex E to the FTR

in a range of altitudes. Interviews were conducted with both men and women members of twenty nine households representing a cross section of ethnic groups. Interviews took place in the interviewees' houses. Apart from the household members, other neighbours also joined the interview. The presence of other people raised many issues and also helped the researchers to triangulate the information collected. Higher participation was observed and a lot of information was drawn from the discussion. Salient outcome beliefs regarding the key land management issues and social referents were identified from the process. The interview schedule comprised mainly open questions. Researchers probed during the discussion in order to obtain in depth responses. These sites were selected also to be broadly typical of the area in which they are located, in terms of ethnicity, accessibility and proportion of female headed households.

Simple statistical analysis was used in order to identify salient beliefs and social referents from the large number mentioned by farmers. This was done through ranking. Each outcome belief and referent was given a score equal to the number of interviews in which it was mentioned. Those with the higher scores were deemed to be salient. In keeping with standard TORA practice, approximately 10 statements were required for each behaviour under investigation.

Based on the analysis of data from the first stage, a structured questionnaire for the second stage was developed. The questionnaire sought information on farmers' awareness, current implementation and intended implementation of each of the six land management behaviours. Implementation was measured using an index comprising a set of specific practices representative of each behaviour. Intentions were measured on a five point scale (-2 to +2) representing the likelihood of the respondent implementing the behaviour within the following twelve months. Outcome beliefs were measured by the level of agreement or disagreement with each outcome belief statement on a five point scale. The perceived importance (outcome evaluation) of each outcome was also measured on a five point scale and outcome attitudes calculated by multiplying each outcome belief by the corresponding outcome evaluation. A subjective norm was calculated for each salient referent as the product of the extent to which the referent was thought to be supportive of the behaviour and the motivation of the respondent to comply with that referent, both components also measured on a five point scale.[4]

After piloting and revising the questionnaire in a site that was not included in the survey itself, the research team completed the second phase of the fieldwork through interviews in twelve locations with a total sample of 254 respondents which generated 252 usable responses. Stratified random sampling was used to ensure adequate representation of men and women and of different livelihood categories. Local informants were consulted and used during the sampling process. Ethnicity, distance from roads and exposure to research and extension on land management were considered during the site selection. Interviews with respondents were scheduled beforehand in order to ensure enough time for the meeting. Interviewers spent some time with other non respondent farmers in the villages to derive information for triangulating some of the output. During the interview, the researchers ensured that all details required in the questionnaire were asked and recorded.

The respondents were broadly representative of the farming population of the mid-hills, though poorer households are slightly under-represented. There were more women (51.2%) than men, nearly half were over 40 years (48.0%) while 10.7% were under 25 years of age,

[4] A copy of the questionnaire can be found in Appendix 2 to Annex F to the FTR

and those identified as of "low" economic status on the basis of food sufficiency criteria comprised 17.5%, compared to 48.0% of "medium" and 34.5% of "high" status.

The locations where fieldwork for stages 1 and 2 of the TORA data collection was done are shown in Table 1 and Table 2 respectively.

**Table 1 Sites for first stage of TORA fieldwork**

| District | Site | low hill | mid hill | river basin | exposed | not exposed | SALT | non SALT |
|---|---|---|---|---|---|---|---|---|
| Chitawan | Paireni | X | | | X | | X | |
| Tanahu | Duwabesi | X | | | | X | | X |
| | Chambas | | | X | X | | | X |
| | Bhansar | | | X | | X | | X |
| Parbat | Pang | | X | | | X | | X |
| | Lower Pakuwa | X | | | X | | | X |

**Table 2 Sites used for second stage of the TORA fieldwork**

| District | Site | low hill | mid-hill | high hill | river basin | exposed | not exposed | SALT | non SALT |
|---|---|---|---|---|---|---|---|---|---|
| Chitawan | Paireni | X | | | | X | | X | |
| Tanahu | Duwabesi | X | | | | | X | | X |
| | Chambas | | | | X | X | | | X |
| | Bhansar | | | | X | | X | | X |
| Parbat | Pang | | X | | | | X | | X |
| | Shankeri-Pokheri | X | | | | | X | | X |
| | Upper Pakuwa | | X | | | X | | | X |
| | Lower Pakuwa | X | | | | X | | | X |
| Palpa | Nayatola | | X | | | X | | X | |
| | Kusumkhola | | X | | | | X | X | |
| Myagdi | Bhakimle | | | X | | X | | | X |
| | Baraumja | | | X | | | X | | X |

## 2.3 Reviewing and influencing the policy making process

An initial review of policies relevant to land management decisions and strategies was done through a desk study of policy documents (Subedi et al. 2002[5]). An analysis of the policy making processes in Nepal was carried out through a series of key informant interviews using

[5] Annex B to the FTR

a prepared checklist of questions and discussion points with five senior staff (section chiefs) in the Ministries of Agriculture and Co-operatives, and Forests and Soil Conservation followed by a one day consultation meeting in Kathmandu with fourteen participants ranging from managers of donor-supported projects to Deputy Directors in government ministries (Holt et al. 2002[6]).

# 3 Results

## 3.1 Land management practices and strategies

The review of grey literature suggested that four broadly defined management practices, validated by research in the hills, could be regarded as fitting the twin criteria of successful local adoption and potential for more widespread adoption: application of composted manure (*mul*) and other organic matter, use of chemical fertilisers, use of legumes within a crop rotation, and a modified form of sloping agricultural land technology (SALT). Locations where research had been successfully carried out were identified. On the basis of agroclimatic, geophysical and socio-economic similarity, a set of potential uptake sites was identified for each of the four practices (Table 3). Locations where fieldwork was carried out are shown in Table 4.

**Table 3 Sites identified for successful Land Management Strategies**

| LMS Number | Successful Technologies | Successfully adopted sites | Potential study sites (Non-intervention sites) |
|---|---|---|---|
| 1 | FYM and Compost Manuring | All ecological zones (Chambas, Lower Pakuwa, Upper Pakuwa and Bhakimle) | Bhanu VDC, Tanahu District<br>Shankar Pokharai VDC, Parbat District<br>Pang VDC, Parbat District<br>Baraumja VDC, Myagdi District |
| 2 | Chemical Fertiliser | All ecological Zones (Chambas, Lower Pakuwa, Upper Pakuwa and Bhakimle) | Bhanu VDC, Tanahu District<br>Shankar Pokharai VDC, Parbat District<br>Pang VDC, Parbat District<br>Baraumja VDC, Myagdi District |
| 3 | Legume in Crop Rotation | In Rainfed Upland Maize based System (Chambas, Lower Pakuwa, Upper Pakuwa and Bhakimle) | Bhanu VDC, Tanahu District<br>Shankar Pokharai VDC, Parbat District<br>Pang VDC, Parbat District<br>Baraumja VDC, Myagdi District |
| 4 | Modified SALT Technology | ICIMOD-NARC Sites (Chitwan) and LI-BIRD site (Palpa) | Kusumkhola VDC, Palpa District<br>Abunkhaireni VDC, Tanahu District |

[6] Annex C to the FTR

**Table 4 Location of field studies to verify potential of LMS for widespread uptake**

| Site | Successful Adoption | | Potential uptake sites | |
|---|---|---|---|---|
| | Location | Characteristics | Location | Characteristics |
| 1 | Lower Pakuwa | Low hills | Pang | Low hills |
| 2 | Upper Pakuwa | High hills | Shanker Pokheri | Mid hill |
| 3 | Bhakimle | High mountain | Baraumja | High mountain |
| 4 | Chambas | River basin | Bhansar | River basin |
| 5 | Paireni | Low, sloping land | Duwabesi, Purbabesi | Low, sloping land |
| 6 | Nayatola | High, sloping land | Kusumkhola | High, sloping land |

In both sets of locations, the research team discussed land management strategies with farmers, focusing in particular on soil fertility management and soil conservation strategies. FGDs provided a forum for documenting the history of the origins, adoption and adaptation of practices related to the strategies. According to farmers, the origins varied from agricultural research centres in the vicinity (in the case, for example, of plastic sheets to cover compost heaps and pits and the use of legumes in rotations), to their own forefathers (in the case of use of manure and green manuring). The importance both of organisations external to the community and of farmers' own social networks through which they hear of the success stories of farmers who have been involved in on-farm research or trials with scientists was apparent in their descriptions of how they first heard about and decided to try new practices (Regmi et al. 2002).

In the intervention sites, factors which have supported uptake include the high level of interest and resource deployment of government and non-government organisations, accessibility and exposure to new ideas, the involvement of organised and motivated farmers' groups, and the felt need to respond to negative pressures such as falling numbers of livestock and declining landholding size per household. The main constraints were related to concerns over high costs, low or risky returns and the perceived (by some farmers) high labour demand of the LMS. Farmers at these sites generally confirmed the technical success of the LMS in terms of higher production of food crops and fodder, enhanced fertility and reduced soil loss (Regmi et al. 2002: 21f.). The reasons for non- or low adoption of land management practices and strategies in the "potential uptake" sites are summarized in Table 5.

**Table 5 Summary of reasons for non-adoption and existing problems of the "potential uptake" sites**

| LMS potential uptake site No. | Reasons behind low adoption of LMS among farmers |
|---|---|
| 1 | Attack of White gruves in millet<br>No Variety selection<br>Lack of fodder and fuel alternatives<br>Lack of Soil fertility management related technologies<br>Use of fresh farm yard manure<br>Negligible support from organizations |
| 2 | Fertiliser management |

| LMS potential uptake site No. | Reasons behind low adoption of LMS among farmers |
|---|---|
| **3** | Variety selection<br>Lack support services<br>Not so accessible from the district headquarters<br>Low support from district level offices<br>Maoist movement<br>Negligible support from DADO office<br>Lack of irrigation<br>Few or negligible organizations involved in the development process<br>Majority are ethnic Magar community<br>Low awareness and motivation among farmers<br>Mostly affected by Maoist movement<br>Lack of male manpower |
| **4** | Difficult terrain and remote from the district headquarters<br>Low support services like schools and other government offices<br>Farmers are unaware about any of the improved technologies<br>Lack of development interventions-farmers usually have poor experience with the development organizations<br>Poor information flow within the community<br>Lack of irrigation facility<br>Khet land is quite limited so farmers do not use chemical fertiliser and so on |
| **5** | Lack support from district level governmental organizations<br>No support from organizations<br>Low education level among wider populace<br>Limited land under cultivation<br>Unwillingness to spend time<br>Risk of failure or achieving low yields<br>Dis-advantaged groups with low exposure to outside world<br>Low awareness and motivation amongst farmers |
| **6** | Farmers are less responsive to change as they cannot replace their traditional crops/cropping pattern<br>Low rainfall (irrigation problem)<br>Lack of improved crop varieties<br>Low support services<br>Lack of technological intervention from GOs and NGOs<br>Land having very steep slope |

The research team recognised that it was necessary to clarify the distinction between specific land management technologies and practices and land management strategies. The distinction hinges on the goals that land managers are trying to achieve through a particular combination of practices. While there is a lot of (mainly grey) literature on improved practices – as shown in Regmi et al. 2002 – there is not much discussion in the literature about the strategic thinking that underlies the selection, adaptation or rejection of these technologies and practices at household level.

Two clear approaches to the definition of a land management strategy emerged from discussions among team members. The first was to base the definition and selection of LMS for study in the project on existing Ministry of Agriculture land management policies. For example, the policy of encouraging farmers to incorporate both organic and inorganic fertilisers, which was inspired by the Agriculture Perspective Plan (APP) initiative to encourage integrated plant nutrient management systems, could be used as the basis for defining a LMS. Others could be based on strategies promoted by NGOs, such as planting perennial species on terrace risers in order to increase fodder availability. This approach, however, assumes that the farmer or household adopts a particular practice or set of practices

with a particular goal in mind. The second approach is to look at principal land management issues articulated by farmers and the combination of practices they employ at the farm level to address these issues. This second approach to defining the LMS was adopted. Two key land management issues were identified based on discussions with farmers during the field validation: integrated soil fertility management and soil conservation. The practices and techniques which farmers relate to the addressing of these issues link soil, livestock, tree and crop management systems. The specific practices and technologies can be seen as tactical means to achieve these two strategic aims.

## 3.2 Policy constraints to uptake

The first stage of the TORA fieldwork identified a large number of outcome beliefs in respect of the six areas of land management decision. Statistical analysis, as described above (page 9) reduced this to between seven and thirteen per area. Table 6 summarises the salient outcome beliefs and referents for each of the six areas of land management decision. The full list of outcome beliefs and referents is in McKemey et al. (2003)[7].

**Table 6 Salient outcome beliefs and referents from stage one of the TORA fieldwork**

| LM practice | Salient outcome beliefs | Salient referents |
|---|---|---|
| **Increased dependency on *mul*** | Forest is too far to bring leaf litter<br>*Mul* will increase crop production (yields)<br>*Mul* alone will not meet the needs of some crops<br>Will not have the labour to manage the *mul*<br>*Mul* will improve the soil<br>*Mul* will be good for crops<br>Will lead to increased insect problems<br>Will not have sufficient livestock<br>Will have to mix *mul* with chemical fertiliser<br>Will lead to reduced crop yields<br>There will not be sufficient *mul* for the crops | Experienced farmers<br>Neighbours<br>Family<br>Research agencies |
| **Stall feeding of livestock** | Animals will be healthier<br>Lead to increased disease (pests and insects)<br>All animals need to graze/exercise sometimes<br>Will have access to forest for additional fodder<br>Will improve the protection against wild animals<br>It will reduce crop damage<br>*Mul* decomposes better when mixed with urine<br>Will not have enough fodder to feed the animals<br>Lead to increased work load (labour)<br>More *mul* will be produced | Research agencies<br>Community<br>Neighbours<br>Family |
| **Increased dependency on chemical fertiliser** | Will lead to increased weed problems<br>Will lead to increased insect problems<br>Will not know how to apply it properly<br>Will lead to acidic soil<br>Will help control weeds and pests<br>Will not be able to buy the amounts needed<br>Will only benefit if combined with *mul* | Experienced farmers<br>Family<br>Community<br>Supplier or store keeper<br>Research/extension agency<br>Neighbours |

[7] Project Working Paper 5, which is Annex F to the FTR.

| LM practice | Salient outcome beliefs | Salient referents |
|---|---|---|
| | Will increase the leafy growth of cereals<br>Land will become difficult to plough or dig (till)<br>Amount needed will increase each year<br>Will destroy the soil over the long term<br>Soil will become hard<br>Will increase production of crops | |
| **Cutting rather than pulling legumes** | Will not loosen the soil<br>Will make no difference<br>Will provide feed for livestock<br>Will be more difficult to harvest *maas*<br>Makes harvesting easier<br>Cutting will produce good soil (soft)<br>Clean grain (without soil and stone)<br>Cutting will increase the soils fertility | Family<br>Neighbours<br>Community<br>Research/extension agency |
| **Planting hedgerows** | Roots will take up some of the field<br>Will provide fuel wood<br>Roots will increase soil fertility<br>Hedgerows will provide multiple benefits?<br>Roots will make ploughing difficult<br>No support available<br>Leaf litter will provide *mul*<br>Will help hold the soil (prevent soil loss)<br>Will provide fodder / forage | Family<br>Community<br>Research/extension agency |
| **Planting fodder trees** | Will fertilise the soil via their leaf litter<br>No support for outside (training)<br>It will be difficult to find seedlings<br>They will help hold the soil (prevent soil loss)<br>Increased fuel wood supply<br>The shade will be a problem for other crops<br>Will provide fodder for livestock | Family<br>Community<br>Research/extension agency<br>Forest user group |

The survey questionnaire for the second stage was designed to enable us to measure the key TORA variables in relation to the six areas of land management decision. These variables were:

- Current behaviour in respect of each area of decision, measured on a scale representing a number of separate practices relating to the behaviour
- Intention to continue or change behaviour during the next one year
- Outcome attitude for each of the outcome beliefs identified during the initial phase of the research, measured as (outcome belief) x (value of outcome)
- Overall attitude towards each behaviour, measured as the sum of all outcome attitudes
- Referent subjective norm for each salient social referent, measured as (normative belief about the social referent) x (motivation to comply with that referent)

- Subjective norm, measured as the sum of all referent subjective norms.

In addition to the calculated attitudes and subjective norms, measures of "stated attitude" and "stated subjective norm" were also taken.

The main part of the analysis involved calculating the correlations between each of the elements and the expressed intention to continue or change behaviour. For the present study, interpreting the data focused on three key sets of correlations. First, a lack of significant correlation between behaviour and intention indicates a degree of dissonance, prompting the question: what is preventing the farmer from behaving in accordance with his or her expressed intentions? This would suggest a potential for a change in behaviour, provided any barriers to the change could be overcome. For this study, a relevant question would then be whether any barrier identified in this way is amenable to policy change or intervention.

Second, a significant correlation between an outcome attitude and intention indicates that the attitude is either a barrier or a driver (depending on the sign of the coefficient and whether the outcome belief is positively or negatively expressed) to change. Barriers represent opportunities to identify and remove constraints, while drivers suggest attributes or consequences of the behaviour which could be highlighted to promote it among those currently not practising it.

Thirdly, the relative strengths of the correlations between attitude and intention, and between subjective norm and intention, will suggest the relative emphasis that should be given to cognitive and to normative elements in any strategy to promote the behaviour.

**The data on intention and behaviour in Table 7 and**

Table 8 below suggest dissonance in respect of three of the behaviours – depending on *mul*, depending on chemical fertiliser, and planting fodder trees. Table 2 indicates that although the proportions of farmers using *mul*, using fertiliser, stall feeding and planting fodder trees are high, there is scope for an increase in the intensity or quality of their practices.

**Table 7 Strength of behavioural intention and correlation with behaviour for the whole sample (n=252)**

| Behavioural decision area | Strength of behavioural intention (mean, median) | Correlation with behaviour |
|---|---|---|
| Increase reliance on *mul* for soil fertility | Strongly positive (1.29, 2) | Not significant (>0.05) |
| Increase reliance on chemical fertiliser for soil fertility | Strongly negative (-0.88, -1) | Not significant (>0.05) |
| Planting hedgerows | Neutral (-0.04, 0) | Significant (<0.001) |
| Cutting instead of pulling legumes at harvest | Strongly positive (1.17, 2) | Significant (<0.001) |
| Stall feeding livestock | Positive (1.1, 2) | Significant (<0.05) |
| Planting fodder trees | Very strongly positive (1.54, 2) | Not significant (>0.05) |

**Table 8 Indicators of current levels of practice in relation to the six behaviours for the whole sample (n=252)**

| Behaviour | Current level (mean; scale) | Comments |
|---|---|---|
| Use of *mul* for soil fertility | -3.15; -10 to +10 | of ten *mul* practices, only one (adding leaf litter) done by more than 50% |
| Use of chemical fertiliser for soil fertility | -0.19; -4 to +4 | 81% use chemical fertilizers – 77% combined with *mul* |
| Planting hedgerows | -3.76; -5 to +5 | 14% have planted hedgerows |
| Cutting instead of pulling legumes at harvest | +2.25; -6 to +6 | 58% cut rather than pull legumes (90% with extension; 29% without) |
| Stall feeding livestock | -0.2; -3 to +3 | 70% stall feed all year |
| Planting fodder trees | -0.59; -4 to +4 | 87% planted fodder trees (16% purchased seedlings) |

Table 9 shows the principal drivers or motivators identified for the sample as a whole. These are the outcome attitudes which correlate significantly with behavioural intention. They show clearly that improvements to soil and prevention of soil loss are important drivers, alongside other more immediate benefits. This is shown schematically in Figure 2. The arrows in Figure 2 are based on significant correlations between behavioural intention and specific sets of outcome beliefs and attitudes. For example, intentions towards the planting of hedgerows on sloping land are informed by farmers' attitude that it will help to prevent soil loss, while at the same time increasing the availability of fodder for their livestock (McKemey, Regmi, et al. 2003: Annex 5, Table 17). The cutting of legumes is encouraged by the belief that it will contribute both to soil fertility and soil stability, both of which are important outcomes for those farmers who adopt the practice.

**Table 9 Cognitive Drivers**

| Behavioural decision area | Drivers (whole sample) |
|---|---|
| Increase reliance on *mul* for soil fertility | *mul* will be good for crops<br>*mul* will improve the soil |
| Increase reliance on chemical fertiliser for soil fertility | fertiliser will increase crop production |
| Planting hedgerows | hedgerows will prevent soil loss<br>hedgerows will provide multiple benefits<br>roots will increase soil fertility |
| Cutting instead of pulling legumes at harvest | clean grain production<br>cutting will result in good soil |
| Stall feeding livestock | animals get better care; protection<br>more *mul* will be produced<br>*mul* will compost rapidly from urine |
| Planting fodder trees | will increase fuelwood supply |

| | |
|---|---|
| | will provide more fodder<br>will prevent soil loss |

The significance of the various drivers differs considerably with topography and with exposure to extension, the two factors on which the sample was stratified, and with socio-economic characteristics of gender, age, education, household size, distance to market, economic status, and affiliation to groups and organisations. This is even more the case with barriers to a change in behaviour. The only barrier which appears to operate at the level of the sample as a whole is the belief that chemical fertiliser will make soil hard and difficult to plough or dig. Table 10 shows some of the main barriers for specific categories of respondent.

**Figure 2 Main drivers for six behaviours relating to soil fertility and soil conservation**

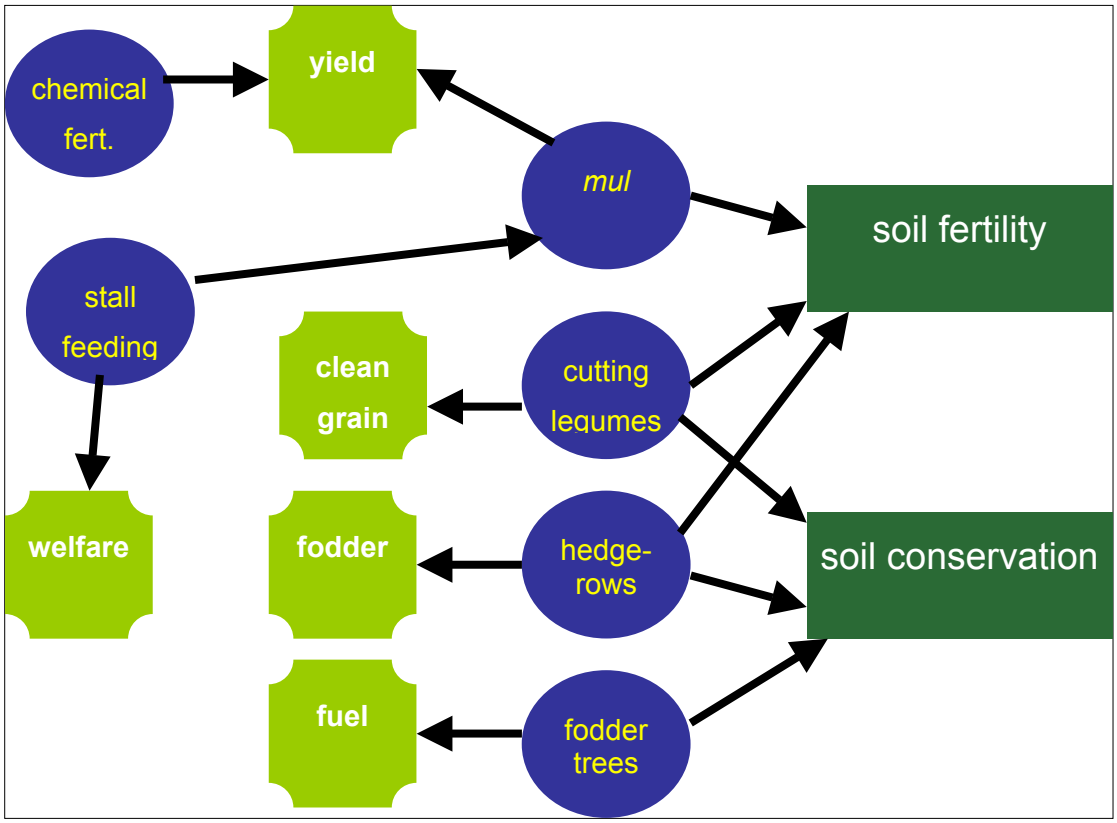


**Table 10 Cognitive barriers to behaviours for specific subsets of farmers**

| Behavioural decision area | Cognitive barrier | Farmers for whom the barrier is operative (1) |
|---|---|---|
| Increase reliance on *mul* for soil fertility | *mul* alone won't meet the need of the crop<br>forest is too far to transport leaf litter | low hills exposed to extension; primary education;<br>within an hour of market; river basin not exposed to extension; SALT areas; primary education; |

| Behavioural decision area | Cognitive barrier | Farmers for whom the barrier is operative (1) |
|---|---|---|
| | relying on *mul* will lead to reduced yields | low hills not exposed to extension; |
| | insufficient livestock | those with no education; river basin exposed to extension; not affiliated to farmer group |
| Increase reliance on chemical fertiliser for soil fertility | soil will become hard and difficult to plough or dig | whole sample |
| | increase in weeds and/or leafy growth | high hills exposed to extension |
| | soil will become acidic or damaged | river basin not exposed to extension |
| | unreliable supply of fertiliser | high hills not exposed to extension |
| Planting hedgerows | roots will make ploughing difficult | no experience of planting hedgerows; distant from market; not exposed to extension |
| | no seedlings available | no experience of planting hedgerows; distant from market; not exposed to extension |
| Cutting instead of pulling legumes at harvest | (none) | |
| Stall feeding livestock | not enough fodder to feed animals | women; high hills |
| | dependent on forest for extra fodder | mid-hills not exposed to extension; farmers with some Kharbari land; smaller holdings |
| Planting fodder trees | difficult to find seedlings | women; far from market; not members of an organisation; mid-hills exposed to extension |
| | lack of village co-operation | 24-40 years old; most educated |
| | shade is a problem for crops | no formal education; not members of an organisation |

Notes: (1) This list is indicative rather than exhaustive. A full analysis of barriers and drivers for different categories of farmer is given in the detailed report on the survey (McKemey et al. 2003).

For some of the land management decision areas, there are differences in drivers and barriers between men and women (in respect of stall feeding, and planting fodder trees), those near and those far from markets, and those with more and less formal education (planting fodder trees). Overall, however, the most frequent difference is between those exposed and not exposed to extension and the promotion of specific land management practices.

In the case of *increased reliance on mul*, the main difference in barriers and drivers is between those who have been exposed to extension and those who have not, though proximity to market and stocking density are also significant (McKemey et al. 2003, Annex

1: 18). While exposure to extension is associated with a stronger influence of the belief that *mul* is good for crops and the soil, it cannot overcome the recognition that those with few livestock may not have sufficient manure to maintain soil fertility without additional mineral fertiliser. For those close to markets, two influential barriers are that *mul* alone will not meet the needs of the crop, and that the forest is too far away to collect leaf litter.

For *stall feeding of livestock*, female respondents were more likely to be put off by the perception that there was not enough fodder to feed the animals (McKemey et al. 2003, Annex 2: 5). This was a barrier also for those in the high hills and those with the lowest stocking density. Increased workload emerged as a barrier to those living closest to where they market their produce. This is perhaps a reflection of the increased opportunity cost of family and hired labour consequent on living near to alternative sources of employment. On the other hand, animal welfare issues are important for the whole sample, with outcome attitudes relating to protection from wild animals and the perception that livestock will get better care emerging as important drivers of the intention to stall feed. The benefits in terms of *mul* production are also influential across the whole sample, though less so than animal welfare.

In the case of *use of chemical fertiliser*, the perception that it makes the soil hard is a widespread barrier to its increased use. Many farmers use it in spite of this, because of the driver that it increases crop yields. Other barriers, significant for some categories of farmers, include other perceived negative short and long term effects of fertiliser ranging from increase in weed growth to gradual destruction of the soil. Exposure to extension is associated with a stronger influence of the belief that fertiliser will increase crop yields, while those not exposed are more likely to be influenced by the perceived negative effects (McKemey et al. 2003, Annex 3: 4).

For *cutting rather than pulling of legumes*, no cognitive barriers were identified (McKemey et al. 2003, Annex 4: 3). There are several drivers, however (Table 9), which are particularly strong for all social categories in sites exposed to extension.

With *planting of hedgerows*, two barriers were significant for those who have not previously planted hedgerows and those living more than four hours from the nearest market: these were that roots would make ploughing difficult, and that there are no seedlings available (McKemey et al. 2003, Annex 5: 5). Interestingly, for those that have planted before, access to seedlings is a driver not a barrier, suggesting that in sites where the practice is becoming established, arrangements emerge for the supply of seedlings. For more rapid uptake of the practice in new areas, however, attention needs to be paid to the initial facilitation of such arrangements.

Finally, for *planting fodder trees*, difficulty of finding seedlings is a barrier for women, those over 40 years of age, primary school leavers, those furthest from markets and those who are not members of an organisation (McKemey et al. 2003, Annex 6: 4f.). Lack of village co-operation acts as a barrier for the 24-40 age group and the most highly educated. For those with no formal education, the shade effect of fodder trees is a barrier. The main drivers – increased fuelwood supply, provision of fodder and prevention of soil loss – are influential with several of the respondent categories.

The main social referents identified by respondents fall into two broad categories: local and external to the village. The latter include extension agencies in the government and non – government sectors as well as commercial input suppliers such as shopkeepers. The former include CBOs such as forest user groups and the community as a whole, as well as family members, neighbours and other farmers. Table 11 shows the influential social referents for

each of the six behaviours, in decreasing order of influence, for the sample as a whole. Again, there are significant differences between categories of respondent. With respect to *mul*, for example, the most influential referent with those farming mid and high hill areas is their family, while farmers managing low hill, river basin and SALT zones are more reliant on their own experience to make soil fertility decisions. However, social referents are also influential, particularly extension and research agencies, especially with those not exposed to extension in the river basin. For those exposed to extension in the SALT zone other farmers and neighbours are also influential referents. With fodder tree planting, households of lower economic status are more likely to be influenced by the community and forest user group than by extension agencies, who are more influential with those of higher economic status. With hedgerow planting, women are more likely to feel a negative influence from community and family, while for men as a whole, these, along with extension agencies, are a positive influence on behavioural intention. These differences cancel each other out when the sample is taken as a whole.

**Table 11 Influential social referents**

| **Behavioural decision area** | **Social referents with significant correlations between subjective norm and behavioural intention (whole sample)** |
|---|---|
| Increase reliance on *mul* for soil fertility | Extension agencies (government and NGO)<br>Neighbours and family<br>Experienced farmers |
| Increase reliance on chemical fertiliser for soil fertility | Shopkeepers (negative subjective norm) |
| Planting hedgerows | (none) |
| Cutting instead of pulling legumes at harvest | family and neighbours<br>community<br>extension agencies (government and NGO) |
| Stall feeding livestock | neighbours and family<br>community<br>extension agencies (government and NGO) |
| Planting fodder trees | family<br>community<br>extension agencies<br>forest users group |

Within the TORA framework, the relative influence of the attitude and normative components is determined by comparing the correlations between intention and attitude, and between intention and subjective norm. In all six behavioural decision areas, both attitude and subjective norm correlate significantly with intention, so both can be considered influential. For two of the decision areas (use of *mul* and cutting legumes), the influence was roughly equal. For two (stall feeding and planting of hedgerows) the normative component was more influential. The remaining two (chemical fertilisers and planting fodder trees) show a stronger correlation for the attitudinal component, indicating that the outcome beliefs which constitute attitudes have a greater influence on intention than the views of social referents (McKemey et al. 2003, Annexes 1-6).

## 3.3 Influencing the policy process

### 3.3.1 Policies relevant to land management

Subedi et al. (2002)[8] review policies and programmes which impact on land management in Nepal. The main policies specific to the agriculture and natural resource sectors are the APP, NEPAP (National Environmental Policy and Action Plan) and the Forestry Sector Master Plan. The successive five year plans (the Tenth plan, which doubles as the country's Poverty Reduction Strategy Paper, covers the period 2002 – 2007) reinforce the general thrust of APP and NEPAP with a particular focus on tackling the high levels of poverty in rural areas.

It is possible to distinguish between policies which directly and deliberately affect land management, and those which are not primarily focused on land management but which nevertheless have implications for the way in which people use and manage land resources. Direct policies may be conceived at landscape level (affecting forestry and watershed management, for example) and at farm level (affecting agricultural practices) but these distinctions are a guide rather than discrete categories. Indirect policies that particularly affect land management at community level are land tenure and fiscal policies (Srivastava et al 1999). Land tenure policies increasingly determine the ability of communities to maintain long-term or sustainable practices, whilst insecurity of tenure tends to promote clearance of protective forest and scrub cover in marginal agricultural areas. Only if property and access rights are equitable and well established can resource users begin to have a stake in the long-term productivity of the land. Fiscal policies that impact on land management include incentives that discourage a systems approach by targeting credit to monocropping and pesticide use, and fertiliser and irrigation subsidies that discourage efficient use of water and animal manure resources.

Important in this context also are policies to establish and strengthen local decision making, which are encapsulated in the Decentralisation Act (1998) and Local Self-Governance Act (1999). However, the ongoing political upheavals and the associated insecurity in many parts of the country have contributed to slow and weak implementation of this legislation. Table 12 summarises the historical development of policies, legislation and interventions relevant to rural land use and management.

At the time of the review carried out for this study, the Ninth Plan (1997-2002), the Agricultural Perspective Plan (1996-2016), the Forestry Master Plan (1988) and the Nepal Environmental Policy and Action Plan (1993) were the main government policy and planning documents specifically intended to influence land management strategies. The Ninth Plan is influential at both farm and landscape levels, while the APP focuses on the agricultural sector and land productivity at farm level. Forestry policies are more often targeted to landscape level. However, implementation of policies through strategy and programme formulations is lacking. Institutional obstacles and unfocussed government policies impede progress for land management. There are broad policy guidelines for soil fertility improvement in the APP and the Ninth Plan but no detailed operational guidelines, strategic actions or work plans have been drafted by research and development agencies to guide policy into action.

Realising the effective and efficient use of land faces a multitude of problems including unequal land distribution, dual ownership land tenure, land fragmentation, and an excessive ceiling on land holding size. The system of dual ownership severely limits productivity as neither owner nor tenants are motivated to invest in the land. Many of the present economic and agricultural policies for agricultural development relating to credit, prices, research and

[8] Annex B to the Final Technical report

extension services, favour monoculture of major cereal crops at the expense of diversified farming systems and soil conserving legume crops. Credit, institutional support and other incentives are directed towards high external chemical-based inputs whilst incentives for farmers to adopt integrated management systems, soil conservation and sustainable agriculture are presently lacking. Table 13 lists some of the major gaps in current policies perceived by policy makers and other stakeholders.

**Table 12 Summary of land use legislation and policies, and impacts on land management at farm and landscape levels**

| 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 | Outline of objectives and impact on land management |
|---|---|
| *Forestry Master Plan* | Strong emphasis on community forestry envisages protection of land against degradation by soil erosion, floods, landslides and desertification |
| **Forest Act** | Forest degradation trend reversed and improved farm level land use systems through increased tree planting on-farm and stall-feeding livestock |
| **Environmental Action Plan** | Reinforces agriculture-related land management policies of the APP |
| **Forest Regulations** | Provides legal authority to FUGs |
| **Seventh Plan** | Focus on soil conservation of afforested land and agricultural intensification |
| **Eighth Plan** | Specific environmental and sectoral policies (e.g. APP) |
| **APP (-2016)** | Emphasis on accelerated agricultural growth with packages: for fertiliser supply and integrated soil fertility management |
| | Poverty alleviation through strategies for soil conservation and fertility improvement |
| **Land Act Amendment** | Not effectively disseminated or enforced, many people lack knowledge of rights, however, if effectively enforced it would impact on adoption of better land management practices such as plant nutrient recycling and soil conservation |
| **Fertiliser subsidy withdrawn** | Easy access to chemical nutrients removed and higher price of chemical nutrients provides incentive to use organic nutrients |
| **Tea and fruit tree subsidy** | Permanent vegetation encouraged and land stabilisation facilitated |
| | Introduced monitoring and evaluation for agricultural extension and encouraged increased outreach to farmers |
| | Introduced land use planning for and monitoring of extension for sustainable agricultural development |
| | Emphasis on public-private partnership in technology generation and input delivery easy, cost-effective delivery of plant nutrients at farm and landscape levels, participatory approach to development of land management technology and flow of information |
| | Development of appropriate technology and information for sustainable hill land management through IPNMS, fruit tree planting and agroforestry |
| **Decentralisation Act** | Enhanced dissemination to, and capacity for planning at, local level |
| **Self-governance Act** | Introduced mechanisms for increasing local decision-making |

Sources: NPC/IUCN, (1991); Blaikie and Sadeque (2000); Chapagain, (2000); Bhatia (2000); Upadhyaya (2000); Ninth Plan (NPC, 1997); HMG/MOFSC (2001). Key to policies: Direct landscape level, farm level; Indirect fiscal & land tenure; Institutional

**Table 13 Gaps in current policies likely to affect adoption of land management strategies at farm and landscape levels**

| Desirable land management strategy | Constraints not currently addressed by policies |
|---|---|
| Investment in tree planting and other land improvements at farm level | Insecure tenure due to dual land ownership |
| Investment in soil conservation measures (fruit trees, bunds) and transport of bulky plant nutrients (e.g. compost) to distant fields | Small fragmented and uneconomic holdings |
| Use of organic nutrients and restricted use of agrochemicals linked to soil compaction and water pollution | Credit available for external fertiliser and pesticide inputs |
| Investment in land improvement and soil conservation measures (vegetative cover, terraces, fodder, fruit and other tree crops, perennial cash crops, hedgerows) | Lack of credit for perennial crops, trees, green manures |
| Incentives to build farmers' capacity for land improvement and collective land management at landscape level (roadside tree plantation, terrace banks, wasteland) | Lack of institutional policies and programmes for local level soil and land management farmer and user groups |
| Land use based on land capability and potential at farm and landscape levels | Lack of institutional policies and programmes on land use planning and zoning |
| Rapid spread and uptake of land management technologies and coordinated systems approach to R&D | Isolated, fragmented, scattered commodity approach to technology generation and dissemination from various agencies (MoAC/NARC, MoFSC, I/NGOs etc) |
| Integrated plant nutrient management systems (IPNMS) and green technologies (green manures, cover crops, hedgerow plantation and legume crops) widely adopted at farm level | Lack of farmer information, training, seeds, planting materials, and subsidy due to unfocused policy on extension of IPNMS and green technologies |

### 3.3.2 Land management planning and policy development in Nepal

Systematic policymaking processes started in Nepal in the mid 1950s with the concept of national development plans in five-year cycles. The National Planning Commission (NPC) at the centre is the responsible authority for coordinating the formulation of national development plans, as well as evaluating the annual plans of the line agencies.

Since the first Five Year plan of 1956-1961, national periodic plans have been the chief means of articulating government development objectives, policies and plans. Until now, nine periodic plans have been developed and implemented and the tenth is mid-way through implementation. The Fourth Five Year plan (1970-75) was the first to incorporate the concept of regional planning through the development of growth axes and the corridor development approach, which divided the country into five developmental regions (Chitrakar, 1990).

Policy-making is largely a centralised activity: area-specific policy is relatively uncommon. Broad policy goals are stated in national five year or longer-term perspective plans. The National Planning Commission (NPC) provides guidelines and directives on national goals and objectives to ministries and agencies of the government. Specific policies that impact at farm and landscape level are identified and formulated by concerned agencies and institutes, such as R&D organizations of the government, and submitted to the ministries for approval.

Policies are also formulated by planning Divisions and Sections of Ministries and their Departments and Agencies, at the direction of Ministers and high-ranking administrative officials (secretaries). Policies are approved by cabinet whose decision is final for all but the major economic and legislative policies. These require approval from lower and upper national assemblies, the general assembly of parliament, and the King, and can be implemented only after public notices are issued in the official Gazette. For lesser operational policies the procedural steps involved are as follows:

- Definition of policy goals

- Identification of specific policy to meet these goals
- Formulation of specific identified policy
- Approval from Government (Cabinet)
- Approval from Parliament (both lower and upper house).

The present policy making process in most cases lacks detailed scientific policy analysis and evaluation and there are no formal mechanisms for participation of relevant actors from private sectors, including the local community in such a procedure.

The main actors in land management policy making are described in Subedi et al. (2002). Historically, government political culture and bureaucratic traditions have remained centralized and hierarchical. Inadequate training of civil servants, and lack of accountability in administration, have discouraged participatory policy making. Lack of a land resource capability database has been an obstacle in the formulation of science-based land use strategies and policies (APROSC 1986). Lack of resources and access to modern information technologies combined with inflexible financial rules provide little scope for improving performance. Poor communication and coordination between departments and agencies within government ministries further inhibit efficient policy formulation (Table 14).

**Table 14 Institutional constraints on policy making in Nepal**

| Issues identified | Constraints |
|---|---|
| Human resource capacity for policy analysis and formulation | Senior level planning and research staff at NARC, DoA/DLS, MoAC and MoFSC lack capability and trained manpower on policy analysis and policy formulation. Specifically there is insufficient trained manpower for policy research and development |
| Use of and access to Information Technology | Modern information technologies (email, internet etc.) are rarely used in government departments in the policy making process, including dissemination methods such as broadcasting and their perceived effectiveness |
| Financial rules and regulations not flexible | Allocation of research and development budgets on integrated soil fertility and land management is limited. In addition HMGN financial rules for expenditure systems are not flexible. |
| Poor communication, linkage and coordination among related actors | Poor availability, accessibility and relevance of information from different institutions within the Government as well from I/NGOs and private sector bodies due to a lack of common platforms and regular mechanisms for information sharing on technical issues relating to LMS |

The review of policies and policy making led to the following conclusions which were discussed at a stakeholder workshop in September 2003 (Garforth, Martin et al. 2004):

- Social, political and economic circumstances in Nepal critically influence and limit the effectiveness of the policy making process.
- Inter-ministry and inter-agency coordination over policy formulation is lacking and information sharing ineffective.
- There is a lack of participation of relevant actors from the private and non-governmental sectors, and farming community.
- Plans and project documents are developed mainly from external consultancy for external funding requirements with little local input.
- Farmers' interests and indigenous knowledge are seldom reflected or represented in policy.

The general consensus was that the above conclusions were valid, though some dissented with the third and fourth points, suggesting that the involvement of non-government stakeholders was greater and the influence of external consultants over HMGN officials and advisers was less than the research team had concluded.

At the time of the study, there was no formal process or structure for bringing national NGO and CBO stakeholders into policy discussions with government and hence into the policy making process (Subedi et al. 2002: 24). However, it is clear that many Nepali NGOs and CBOs have been active throughout the 1990s in advocating for policy change and in initiating dialogue with government. The Community Self Reliance Centre (CSRC), for example, is typical of NGOs set up in the wake of the establishment of democratic government. Since 1993 it has been active in securing land rights for tenants and landless farmers in the terai districts and has extended its campaigning on land policy issues to the national level. CSRC has "organised training, campaigns and rallies to pressurise [for] policy adoption and reinforcement for … implementation", aimed at both district and national levels of government (MODE Nepal 2004: 3). Other NGOs, such as Nepal Agroforestry Foundation and LI-BIRD, use their research, much of it funded from sources outside Nepal including bilateral donors and international research organisations, as a basis for advocating for policy review and change. Personal contacts between leaders of NGOs and government ministers and senior officials are an important channel through which this influence is brought to bear. However deliberate use of the mass media also features in the strategies of NGOs and CBOs[9].

International organisations working in Nepal also have a voice in the policy discourse. These range from international research institutes (particularly, in the context of land management in the hills, ICIMOD) to development partners (World Bank, bilateral donors). The fact that the latter have considerable funds at their disposal for development programmes and projects does not necessarily give them a strong voice in policy development: several individuals within these organisations privately expressed their frustration at the ability of the government to pay lip-service to policy suggestions which they then water down or fail to implement effectively.

# 4 Discussion and Conclusions

## 4.1 Encouraging improvements in land management through policy change

Analysis of the TORA data suggests several potential policy implications. One common thread is that local R&D and extension activity has been effective. There are significant differences in many aspects of the behaviours between farmers who have been exposed to extension and those that have not. Another is that extension programmes need to be responsive to differences between areas (topography, farming system) and categories of farmer and household.

Zone sensitivity in extension applies particularly to promoting the better management and use of *mul*, with the technical content of extension reflecting the availability of leaf litter and other organic matter. Promoting tree planting to provide more leaf litter would be an option where this is currently a constraint. More generally, the decline in livestock numbers suggests that promoting the production of higher quality *mul* and using it as efficiently as possible will be increasingly relevant to many households. At the same time, particularly for households

[9] It is perhaps an indication of the perceived influence of the mass media that the king has recently (October 2005) prohibited any media content criticising him and his policies (Guardian 21/10/2005).

with few or no livestock, work on developing and promoting alternative means of soil fertility management (including green manure and improved rotations) should continue. In some places in Nepal, a market in animal manure has emerged (e.g. between intensive poultry operations in the Hetauda area and commercial vegetable producers in the Pokhara Valley). There may be ways in which government and NGO agencies can facilitate the development of more local markets in *mul*. There are also implications here for the management regimes adopted by forest user groups, who control access to forest resources which are vital for many farmers' production of high quality *mul* in sufficient quantities.

The need for policy and effective policy implementation relating to fertiliser has already been taken on board by MoAC, with the new (2002) Fertiliser Policy. Local testing of the quality of fertilisers available in the market can help to counter the uncertainty and vulnerability that farmers face. Empowering farmers through better information about nutrients in chemicals, through enabling CBOs to undertake quality testing and generally through encouraging them to demand quality testing from DADOs may help make current policy more effective. On the extension front, a more balanced emphasis on the use of fertiliser within an overall nutrient management strategy which will maintain soil quality rather than focusing only on maximising production is also reflected in the current fertiliser policy.

With hedgerows, a major constraint is the lack of seedlings. Facilitating the development of local nurseries and supporting the farmer-to-farmer supply of seedlings are obvious starting points in areas where hedgerow planting is a viable option for farmers. Participatory technology development to adapt the technology (species, spacing, management) to new areas will be important. To overcome barriers to uptake, extension should address negative perceptions about rooting systems and encourage a more informed assessment of competition. This could be linked effectively with extension on the continued maintenance and management of hedgerows to optimise benefits and minimise negative effects.

Extension has been effective in promoting the cutting rather than pulling of legumes, particularly in raising awareness of the soil fertility effects. This awareness is lower among women, suggesting that it would be sensible to focus attention on female members of farming households – who are in any case more likely than men to be the ones harvesting legumes and so will be making the on-the-spot decision. The clean grain benefits could also be emphasized; but for farmers who are growing legumes for sale this will not be a strong motivator unless they are able to secure a price differential for clean grain. There is perhaps a role for CBOs here in promoting the idea among consumers and farmers alike.

Although stall feeding is widely practised, there is scope for enhancing current practice. As with *mul*, a critical factor in some areas will be the way in which community forest is managed, given the significance of "dependence on forest" as a barrier for some categories of farmer. At the same time, promoting the planting of trees on farmers' own land and the forage benefits of hedgerows would increase fodder availability.

These findings suggest some specific areas for policy review and change.

1. Support for extension reform. Donors are frustrated with the progress achieved under AREP. The evidence of this study is that extension does have a positive impact on attitudes towards improved land management but that greater differentiation is needed in the planning and targeting of extension interventions. Extension methods based on local experimentation have potential for finding appropriate solutions to some of the barriers identified (e.g. in relation to *mul* production and the planting of fodder trees). Training of extension staff at all levels, both pre- and in-service, can help to foster the skills and attitudes supportive of these changes. A useful step forward would be to discuss this

potential with those who plan, fund and deliver such training. But significant improvements in farmers' access to effective and responsive extension services will only come with successful reform of the whole structure of public sector extension (see section 4.2 below), which is a matter for the Planning Commission to consider.

2. Community Forest management. District Forest Office staff have a high level of influence on the management plans for community forest handed over to forest user groups. These plans affect people's access to organic matter for *mul* production and to fodder for livestock. More flexibility in the development of management plans, to reflect local circumstances and needs, would help to overcome some of the barriers identified in this study. This is within the remit of senior officers in the Ministry of Forests and Soil Conservation who are responsible for reviewing the procedures and requirements for management plans and for providing guidance to District Forest Officers.
3. Fertiliser policy. While the new (2002) fertiliser policy does address some of the concerns raised by farmers in this study, particularly with its more balanced emphasis on IPNM (see below, section 4.2) and the removal of subsidies, quality assurance is a high priority. Much more needs to be done to intensify the testing of fertilisers available on the market, which in turn requires more resources for DADOs. This is an area where civil society organisations can have an impact, by putting pressure on DADOs on behalf of farmers to use the available testing equipment for quality checks. In the longer term, any future programme of reform and strengthening of local government should consider giving local authorities authority and capacity to carry out testing and impose sanctions on suppliers (at all levels) found to be adulterating or misrepresenting their products.
4. Land tenure. Tree-planting on farmland and the establishment of hedgerows are discouraged by insecurity of land tenure, particularly for those holding land on annual or informal tenancy arrangements. The Land Act amendment in 1997 was designed to increase security of tenure by removing "dual ownership". Implementation, however, has been weak. Mass media have a role to play here in ensuring that people are aware of their rights under the legislation. Civil society organisations can provide support through advocacy with the judicial system and by supporting specific legal challenges.
5. Credit for establishing local nurseries. Under APP, credit and subsidies are focused on the commodities identified with specific regions. This commodity focus ignores the capital needs of enterprises that would contribute significantly to improvements in land management. Lack of seedlings is a constraint to the planting both of fodder trees and of hedgerows. Senior officers in MoAC should be encouraged to review the guidelines for implementation of APP to allow support for the establishment of local nurseries by private entrepreneurs, CBOs and communities.

These policy issues are already under scrutiny in Nepal, particularly in the NGO and CBO sector and among donors. For example, the land tenure issue is the subject of widespread advocacy by NGOs, who have initiated discussion with and lobbying of government, both around substantive policy issues (strengthening the rights and protection of tenants; access to land for the poor and landless) and the weak implementation of the current Land Reform Act 1974 (MODE-Nepal 2004). Similarly, the management of forests which have been "handed over" to forest user groups is the subject of current debate and lobbying, in response to what appear to be changes in the guidelines which increase the influence of traditional principles of state forest management at the expense of local livelihood needs. What this research offers is additional fuel for the debates around these, showing specific potential impacts on land management strategies of policy changes.

It is interesting to note from section 3.2 that economic status (low, medium, high – based on food sufficiency criteria: McKemey et al. 2004, Appendix 2 qu. 8) was not *per se* associated with particular barriers for any of the six decision areas. So in general terms, policy implications cannot be disaggregated by poverty in terms of broad economic categories. However, there are barriers which particularly effect those in more remote areas, those not members of organisations, those with fewer livestock and those with less exposure to extension and other development services – all of which can be taken as associated to varying degrees with poverty. Support for extension reform would benefit particularly those in remote areas and those currently with little or no extension support. To the extent that women are discouraged from stall feeding because of lack of fodder, a review of community forest policy could lead to faster handover of forest to forest user groups, a greater voice for group members in their management, and management plans which prioritise sustainable offtake of fodder for livestock.

## 4.2 Policies and policy making

Discussion of the outputs from the TORA analysis at the stakeholder workshop in September 2003 identified nine areas of policy which affect farmers' land management decisions. The 36 participants in the workshop included representatives from national and international NGOs as well as members of the National Planning Commission, senior civil servants ranging from Deputy Directors of Divisions of relevant Ministries to the Secretary, Ministry of Agriculture and Cooperatives.

*Extension policy and programmes* Operational policies of extension organisations play an important role in determining what practices and strategies are promoted and how the organisation interacts with farmers and communities. The policy of pulling public sector field level extension staff back to Agricultural Service Centres is thought to have reduced the interaction between most farmers, particularly women, and the staff of District Agricultural Development Offices (DADOs). On the other hand, some NGOs, often working in partnership with DADOs, have been facilitating the exchange of ideas between farmers and between communities on agricultural land management. Strategies to promote soil conservation and soil nutrient do figure prominently in extension programmes. These include various approaches to integrated plan nutrient management (IPNM), promotion of legumes in rotation with rice and wheat and other approaches to integrating legumes in cropping systems, increasing the on-farm production of biomass for fodder/forage, and enhancing the quality of FYM/compost. The difficulties faced in introducing extension reform under AREP provides an insight into the challenge of implementing policies which have the potential to increase the efficiency and responsiveness to farmer demands of extension programmes but at the same time are perceived as threats to established roles and power bases within government departments.

*Fertiliser policy* The new fertiliser policy introduced in 2002 encourages IPNM. Earlier, in 1997, the fertiliser market was deregulated, breaking the monopoly of the Agricultural Inputs Corporation (AIC). Stakeholders at the workshop agreed that this increased the availability and hence the use of fertilisers and has also raised awareness of issues to do with quality. Here again, implementation lags behind policy: DADOs are supposed to have facilities for quality testing of fertilisers on the market, but few farmers are aware of this and there is little evidence in the field of any routine testing of samples.

*Land tenure policy* The Land Act Amendment of 1997 was supposed to clarify and strengthen the rights of tenants. However, it has not been effectively enforced and there is

widespread ignorance of their rights. Stakeholders at the workshop felt that effective enforcement would have a positive impact on adoption of improved land management practices such as plant nutrient recycling and soil conservation because it would reduce uncertainty about a tenant farmer's rights over the land beyond the growing season.

*Incentive mechanisms* Workshop participants suggested that subsidies and the free distribution of inputs (such as seedlings of fodder species) would increase uptake of improved land management strategies. Care is needed, however, not to distort markets so that commercial input supply is discouraged. Increasing the availability of planting material through support to village-level nurseries operating on a private enterprise or a community managed basis is likely to have more impact both on uptake and on local livelihoods.

*Alternative sources of livelihoods* The PRSP / Tenth Plan asserts that agriculture will remain a major component of livelihood strategies for the majority of rural households. It also acknowledges the importance of enabling households to move into new activities and enterprises if significant inroads are to be made into the persistently high levels of poverty in rural areas. Increased diversification of livelihoods has the potential to impact negatively on labour intensive land management strategies. On the other hand, it could also lead to relatively marginal land being taken out of production, taking pressure off steeply sloping land.

*Policy on development planning* When this project started, development planning was highly centralised. The preparation of the Tenth Plan marked a significant departure from this, with widespread consultation through regional and district level meetings. As noted above, legislation is in place to strengthen local decision-making. Workshop participants highlighted the need for policies to be flexible so that implementation can be appropriate to landholding, socio-economic context and demand.

*Land use policy* Cultivation on steep slopes is widely seen as contributing to poor land management. There are calls for stricter controls, but whether these could be effectively enforced under the present political situation must be in doubt.

*Forest policy* Workshop participants felt that forest policy – despite the focus within the Forestry Sector Master Plan on community forestry and the handing over of responsibility for managing forests to local Forest User Groups (FUGs) – is still dominated by national emphasis on management for timber production. A greater focus within forest management plans on local livelihood needs would increase the availability of forest products to support improved land management strategies. Co-ordination between the Ministry of Forest and Soil Conservation and the Ministry of Agriculture and Cooperatives is felt to be weak at both national and local levels.

*Market outlets* Land management in rural areas is ultimately affected by the demand for agricultural products. APP's emphasis on promoting the production of specific commodities in specific agro-ecological niches will only make sense if markets are available for those commodities. This is recognised in the Tenth Plan / PRSP which says that government will identify and promote internal and external markets for agricultural produce. Being able to place products in international markets for organic and/or high value produce will encourage the uptake of land management strategies which support long term improvement in soil stability and soil nutrient status.

### 4.3 Informing the policy process

Improving the contribution of science-based knowledge and information to policy making requires that the outputs of research are fed into the general discourse on rural development and livelihoods within Nepal, including among local representatives of external agencies such

as donors and research organisations and international NGOs. Policy makers and other stakeholders at the project workshop in September 2003 felt that the best ways of doing that were through face-to-face interaction between policy makers and researchers. This could take the form of short workshops and seminars to provide updates on the latest research, or ad hoc briefing sessions on specific projects. Overall, it was felt that there are too few opportunities for researchers and policy makers to interact.

Interaction can be taken a step further through field visits, where policy makers can see for themselves the outputs of research and the impact on land management and farmers' livelihoods of their uptake. This would be one way of enabling farmers to have a direct voice in the development of the discourse among policy makers. Researchers can use the mass media both to help set the agenda for public discussion about land management issues and also in a more targeted way to communicate with policy makers and those close to them. Stakeholders suggested that short briefing papers setting out problems and their solutions are particularly helpful (Garforth, Martin et al. 2004).

However in the current political situation and the reality of administration in rural Nepal, lack of awareness or acceptance by policy makers of the successful results of land management research is probably not the biggest obstacle to the wider uptake of land management improvements. The results of the TORA analysis suggest that improved communication between communities, facilitated by intermediaries such as NGOs and field level officers of central government departments and local administrations can have a substantial effect on farmers' acceptance, uptake and adaptation of successful land management strategies. Weak policy implementation has long been a fact of life in the agricultural and natural resource sector. The present stand-off between government and the Maoists means that policy implementation in the majority of rural districts has become even more problematic than before. But it would be an oversimplification to blame the Maoist "problem" for disrupting government efforts to implement potentially beneficial policies. As the World Bank staff appraisal report on the tenth plan and PRSP states: "the Maoist insurgency is, in part, a reflection of the rising disenchantment with inefficiency and corruption in the public sector, large persistent inequalities including along ethnic and gender lines, and poor delivery of public services" (World Bank 2003: 2).

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