

Policy brief

Rural livelihood trends and vulnerability to climate change: evidence from Nepal

Anja Byg

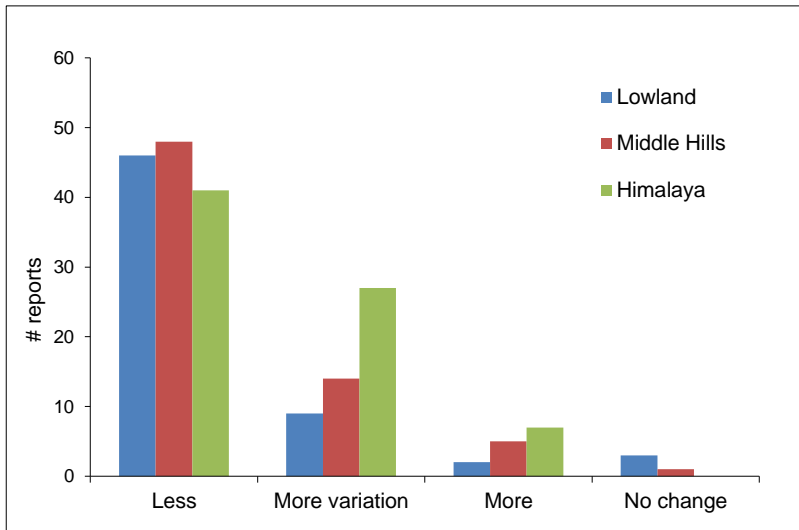
In many developing countries, people's own efforts to adapt to climate change play a significant role due to the limited state resources available. Whether or not households adapt partly depends on the resources available to them (e.g., Eriksen *et al.* 2005, Sallu *et al.* 2010). In addition, individual, cultural and social factors influence people's perceptions, priorities and choice of action (Adger *et al.* 2009, Byg & Salick 2009, Jones & Boyd 2011, O'Brien & Wolf 2010).

Furthermore, climate change is not the only change which people have to adapt to. Government policies, market integration, social change and globalisation are other important factors which rural households face. These changes and people's responses may contribute to or mitigate people's vulnerability to climate change and influence adaptation options (Eakin 2005, Leichenko & O'Brien 2002, O'Brien & Leichenko 2000).

A study of local perceptions, impacts and responses to climate change as well as other changes was carried out in rural communities in the three physiographic zones of Nepal (Lowlands, Mid Hills and Mountains) in order to investigate the vulnerability and adaptation of these communities to climate change. The study consisted of a mix of quantitative and qualitative methods in the form of household surveys, focus groups and individual interviews.

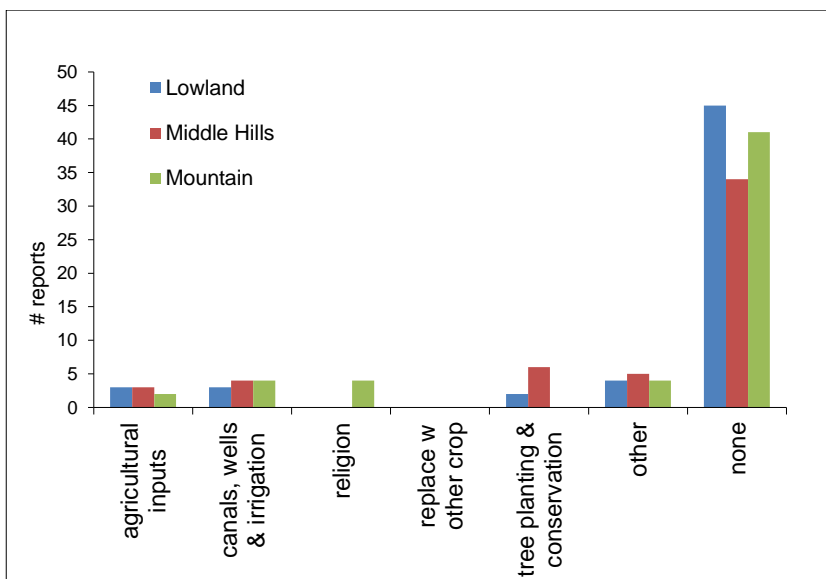
The study showed that climate change impacts are already clearly perceptible in all three study areas. Some trends such as increasing temperatures, less winter rain and more irregular summer monsoon are common to all three areas while others are site specific (e.g. flooding in the lowland site). In all three sites, the perceived climatic changes are believed to have led to reduced agricultural output. In addition to direct climatic impacts (mainly due to changes in the amount and timing of precipitation) agriculture is impacted by indirect impacts such as an increase in pest attacks (diseases as well insects and weed infestation).

Figure 1. People's perceptions of changes in precipitation in three sites in Nepal (based on a household survey with 50 households in each site).



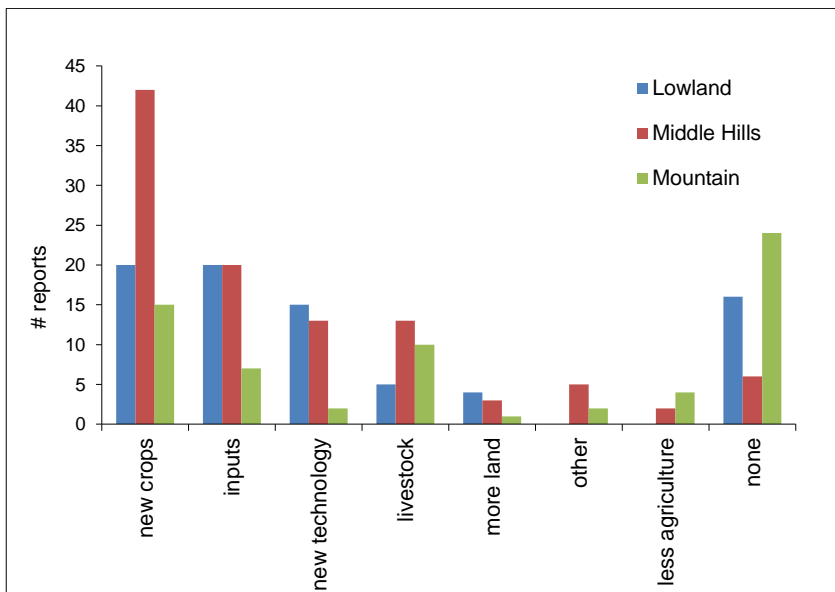
Despite the observed negative impacts of climate change few of the respondents had taken actions directly in response to climate change (Figure 2).

Figure 2. Adaptations taken in response to perceived climate changes in three sites in Nepal (n=150).



However, most had implemented changes in their agricultural practices in response to other changes within the last ten years such as greater market integration and availability of external inputs (Figure 3).

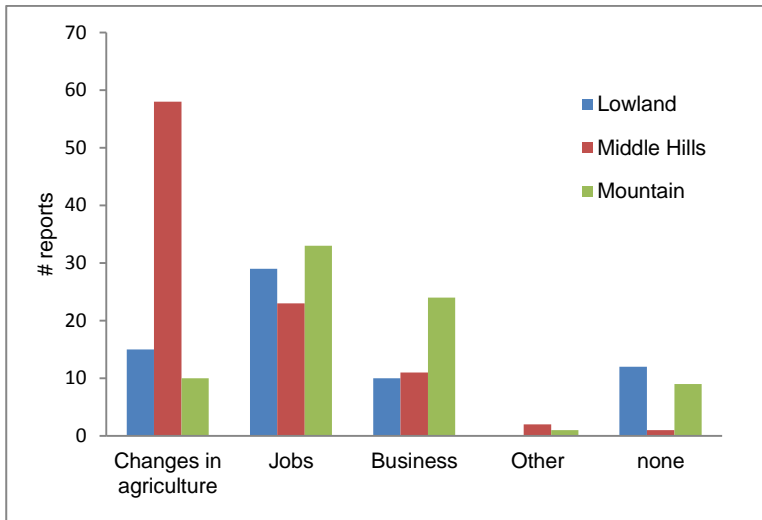
Figure 3. Changes in agriculture in the last ten years in three sites in Nepal (n=150).



Some of these changes such as the introduction of chemical pesticides helped farmers to off-set climate induced losses, at least temporarily. However, other changes such as the replacement of native crops with exotic varieties (which earn higher market prices) may counteract future adaptation to climate change by reducing the genetic variation available to farmers in Nepal. Even the changes which are currently seen as advantageous are thus not unproblematic in the longer term. For example, the interviewed farmers already reported increased pest resistance, declining soil fertility and increased health as well as environmental problems linked to the use of chemical inputs (pesticides and fertiliser).

Another important trend is the increasing contribution of non-agricultural income sources to the livelihoods of rural households in all three study sites (Figure 4).

Figure 4. Changes in livelihoods in three sites in Nepal (n=150).



Examples of such income sources are tourism, small business enterprises and temporary migration either to urban areas within Nepal or to other countries, notably India, the Middle East and South-east and East Asia. Generally, non-farm income diversification renders rural households less vulnerable to climate change impacts which are most immediately felt in agriculture. However, the outcome of livelihood diversification and greater integration into markets varies from case to case. Some studies have shown that market integration may exacerbate rather than mitigate rural households' vulnerability to climate change by adding fluctuations in national and international markets to climatic variability, a phenomenon which has been termed 'double exposure'. In addition, activities such as nature tourism are also sensitive to climate change which influences the presence of big charismatic animals such as snow leopards and the scenic beauty of the landscape.

While non-farm income could be used to invest in climate-proofing agriculture this seems, as mentioned above, not to have taken place so far. In the mountain area where agriculture is least profitable it was seen that people were increasingly abandoning agriculture in favour of more lucrative non-farm work such as tourism. With declining agricultural outputs due to climate change this is a tendency which may become stronger in the coming decades. While abandoning agriculture and shifting to less climate sensitive sectors may be a sensible choice for the individual person and household it does not bode well for the food security of Nepal which has been declining in recent years.

Policy recommendations:

Integrate climate change adaptation with more general development policies as rural households' vulnerability and adaptation depends on the interplay of climate change and other changes.

Support the development of markets for traditional crop varieties and species which are less sensitive to climate variation.

Support agricultural extension services which incorporate climate change and help to ensure that agriculture remains economically, ecologically and socially sustainable despite changing climatic and economic conditions.

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