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Assets and Adaptation: An Emerging Debate

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1 What is adaptation?

Previously viewed as a somewhat defeatist response to climate change, adaptation is now seen as an essential component of any climate policy (Pielke *et al.* 2007). There are three main reasons for this increase in interest. First, that the impacts of climate change are already being observed and, because of lags in the natural system, more impacts are inevitable (Burton *et al.* 2002). Second, that mitigation responses have been slow and inadequate, making adaptation all the more necessary (Reid and Huq 2007). And third, aware that they are likely to bear the greatest physical impacts from climate change, governments in developing countries are increasingly demanding greater attention to adaptation on the international stage.[1]

Adaptation is about tackling the effects of climate change, mainly through increasing the resilience and capacity to cope with its physical impacts. It has been defined by the IPCC (2001) as:

> Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Tanner and Mitchell (2008) highlight some important distinctions about adaptation: first, between *ex ante* (anticipatory) or *ex post* (reactive) adaptation; and second, between *planned* and *autonomous* adaptation.

Initial attempts at adaptation appear to have mainly been anticipatory and planned, using large-scale modelling of primary and secondary impacts to inform policy choices and expenditure decisions. Such an *ex ante*, top-down approach lends itself to large-scale, technological solutions to climate change (such as improved infrastructure, flood protection, or improved seed varieties) (Tanner and Mitchell 2008). While there is much to commend this approach, it also has certain drawbacks. For example, modelling work often has poor resolution (or granularity), and the technocratic nature tends to ignore social determinants of vulnerability (such as ethnicity, or ascribed status).

A more recent approach to adaptation appears more inductive in nature, based on the existing coping strategies of communities and individuals to risk (Huq and Reid 2007). This approach builds on the substantial literatures on indigenous technical knowledge and coping strategies. The most prominent example of this approach is community-based adaptation (see below).

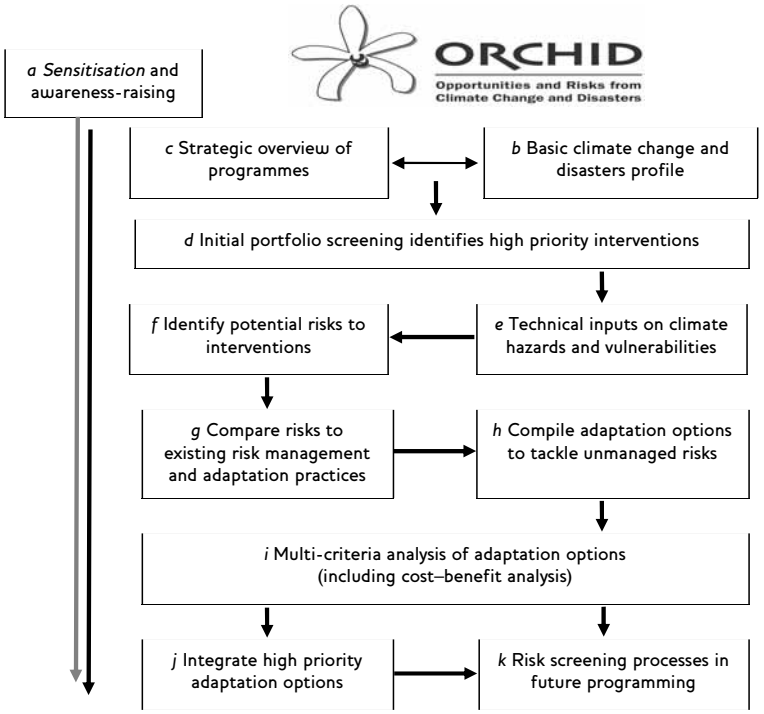
Both approaches to adaptation could be highly beneficial for the poor. However, so far, there appears to have been limited consideration of what pro-poor adaptation means precisely. We discuss this briefly, before outlining the structure of the article.

2 What is pro-poor adaptation?

We argue that issues of justice and fairness should be integral to climate change policy. Countries which face the greatest dangers from the physical impacts of climate change – mainly in South Asia and sub-Saharan Africa – have contributed least to greenhouse gas emissions (Huq and Ayers 2007). Moreover, there is a profound sense of injustice if the poorest within societies are forced to suffer most from the physical impacts of climate change (as they, also, have contributed least, see Paavola and Adger 2006; Thomas and Twyman 2005).[2]

Adaptation raises important questions not only about the types and aims of responses, but also who bears any costs, who is involved and who benefits (see

Figure 1 The ORCHID climate risk screening methodology



Source Tanner (this *IDS Bulletin*).

IPCC's (2001) definition above). Any definition of pro-poor adaptation needs to incorporate these concerns, and must go further than plain adaptation.

At a minimum, adaptation benefits need to outweigh the adaptation costs for poor people. They need to see *net benefits*. But to be pro-poor, adaptation needs to do more than this. Considering their limited contributions to greenhouse gas emissions, pro-poor adaptation should ensure that poor people do not suffer from climate change more than rich people do. Or, to take it further, that poor people suffer less from climate change than the rich. In other words, pro-poor adaptation should be achieved in relative terms with poor people benefiting more from adaptation measures than the rich. Pro-poor adaptation, whether anticipatory and planned, or inductive and autonomous, is an opportunity to ensure that climate change policy is just and fair.

In this article, we suggest that assets are a vital element of any pro-poor adaptation strategy. However, so far, there appears to have been little explicit consideration of the role of assets in limiting risk and building resilience to climate change. Assets, as used here, are resources which people use not only to generate additional flows and stock (Ford 2004, cited in Moser 2007), but which also give 'the capability to be and to act' (Bebbington 1999: 2022). Assets thus include both tangible capitals (natural, physical, and financial) as well as intangible capitals (human and social).

The rest of this article discusses the extent to which assets can play an important role in pro-poor adaptation. We discuss this question by examining three bodies of literature: first, on mainstreaming climate risk reduction; second, on household- and individual-level vulnerabilities; and third, on assets and asset-building approaches to poverty reduction. For each body of literature, we highlight a current adaptation strategy that is based on this approach. We then discuss some conceptual issues which underpin the perspective.

For climate risk reduction we discuss the ORCHID approach to disasters and climate change. We then summarise the conceptual debate on hazards, vulnerable populations and disasters (on which ORCHID is partially based). For household- and individual-level vulnerabilities we discuss community-based adaptation, before highlighting the way that vulnerability has been conceptualised in the poverty and livelihoods literature. And lastly, we highlight an urban assets adaptation framework, before moving on to discuss the conceptual debate on assets and poverty reduction. While the role of assets is clear in the third of these literatures, the role of assets has so far remained implicit in the first two.

The article concludes by highlighting four key areas for future research: first, the changing importance of certain assets under climate change; second, which assets might be required in which contexts; third, how does this link with strategies to enhance livelihoods or to diversify them; and fourth, that while assets and adaptation have been considered in urban locations, there is also a need to focus on rural spaces, for this is where the majority of the poor will be located for the next two decades at least.

3 Climate risk reduction

ORCHID (Opportunities and Risks of Climate Change and Disasters) is a managerial response to mainstreaming climate risk management. The approach spans disaster risk reduction and adaptation in the context of mainstream development programming. For example, the approach appraises projects and programmes in terms of how climate change will affect their aims and objectives (see Tanner *et al.* 2007a, 2007b; Tanner and Conway 2006). Such appraisals are important as the physical impacts of climate change (such as the increased frequency and severity of natural hazards) can impact on poverty reduction and development through a number of channels (Tanner, this *IDS Bulletin*; Benson and Clay 2004):

- Direct physical impacts, such as damage caused by extreme weather events
- Indirect impacts, such as increased morbidity after a hazard
- Fiscal impacts, as hazards create pressures on budgets, often resulting in the reallocation of resources.

The ORCHID approach involves applying current and future climate impacts (both physical and secondary) onto a project portfolio, suggesting adaptation opportunities, and prioritising projects that offer substantial risk reduction (Tanner and Conway 2006).

A schematic representation of the methodology used is illustrated in Figure 1.

While ORCHID is not solely based on the study of hazards and disasters (not least as it is strongly influenced by managerial approaches to adaptation), the approach is partially underpinned by this body of literature.

Since the 1970s, the study of hazards and disasters has been dominated by two main paradigms: a behavioural paradigm and a structuralist paradigm (see Wisner 1993; Kirkby *et al.* 2001). The older and dominant behavioural paradigm believes that disasters are caused by 'extreme forces of nature' and the poor perception of these hazards. It believes in the ability of technology, prediction and bureaucratic organisation to mitigate disasters (Bankoff 2001; Smith 1996; Blaikie *et al.* 1994). Within this paradigm, there is a strong physicalist/naturalist strand that places most emphasis on 'violent forces of nature', and a weaker strand of where 'the limits of human rationality and consequent interpretation of nature lead to tragic misjudgements in our interactions with it' (Blaikie *et al.* 1994: 11).

The second paradigm, which emerged through the 1970s and 1980s, asserts that physical hazards are distinct from the disasters that they potentially cause, the required linkage being a vulnerable population (Wisner 1993). In this respect, the structuralist paradigm gives secondary importance to a 'natural' hazard as a determinant of a disaster (Blaikie *et al.* 1994).

While both paradigms contend that disasters occur when there is an interaction between a hazard and a population, they disagree over the extent to which a disaster is determined by the severity of the hazard, or the vulnerability of the population. The behavioural paradigm places most emphasis on the former, while the structuralist paradigm places greater emphasis on the latter. Structuralists point towards the uneven global distribution of deaths from natural hazards to support their position – in other words, that nearly all deaths from disasters, triggered by natural hazards, are located in the 'developing' world, while hazards themselves are spread much more evenly (Smith 1996).

While not explicit, the kernel of this debate is whether to put more emphasis on the external element of disasters (the hazards) or the internal element (the ability of a population to resist and respond to hazards). The debate clearly has great resonance with climate change adaptation, as can be seen through the application of the ORCHID approach to the Department of International Development's (DFID) portfolio of projects in Bangladesh, which led to the implementation of a number of adaptation initiatives. Based on projections of increased flooding, more variable rainfall patterns, and sea level rise in coastal regions, a number of adaptation initiatives have been proposed. These include raising homesteads in the chars, flood proofing of transport infrastructure, and improved infrastructural design within health and education programmes (Tanner *et al.* 2007b). As is clear, many of these measures have focused on the internal element of disasters.

Overall, within the hazards and disasters literature, and climate risk reduction approaches partially based on this approach, assets are only referred to implicitly. They form part of the internal element of the hazard/vulnerable population interface. We now shift scale, and move to the micro-level through focusing on community-based adaptation.

4 Household- and individual-level vulnerabilities

One recent development at the micro-level is community-based adaptation. This is a bottom-up approach which stems from the fact that adaptation policies do not have to start from scratch: people have been managing (or failing to manage) climatic hazards for centuries (Adger *et al.* 2003; van Aalst *et al.* 2008). Community-based adaptation thus builds on existing technical knowledge and coping strategies of individuals and communities (e.g. see Bharara and Seeland 1994; Chatterjee *et al.* 2005; Mendelsohn and Dinar 1999; Mortimore and Adams 2001). Such knowledge is combined with insights from participatory approaches to development (as mainstreamed by Robert Chambers and others since the 1980s – for an early example, see Chambers 1983, Ch. 8). While a relatively new approach in the context of climate change, community-based adaptation is therefore based on certain established principles (Huq and Reid 2007):

- Outside agencies must gain the trust of communities through immersion in the field and through using brokers and intermediaries (such as local NGOs or community groups).
- Possible future adaptation initiatives must be embedded in communities' existing knowledge of climate variability, and must be based on community members' participation.
- That community-based adaptation is a form of action research, and can only be learnt through practice.

The central element of community-based adaptation is learning about current strategies and assessing current vulnerabilities. Increasingly, such assessments focus not just on the climate but examine the full range of shocks and stresses identified by the community. One example comes from south-west Bangladesh. Here, a community-based adaptation approach has highlighted how the expansion of shrimp farming, while improving income for richer villagers, has resulted in a number of negative impacts for poorer households: saltwater intrusion and declining agricultural productivity, and the reduced supply of freshwater and reduced access to communal land. In this example, accumulation for some has been at the expense of reduced resilience for many: the poor have become increasingly vulnerable to the physical impacts of climate change through reduced income and declining food security (Pouliotte *et al.* 2006).

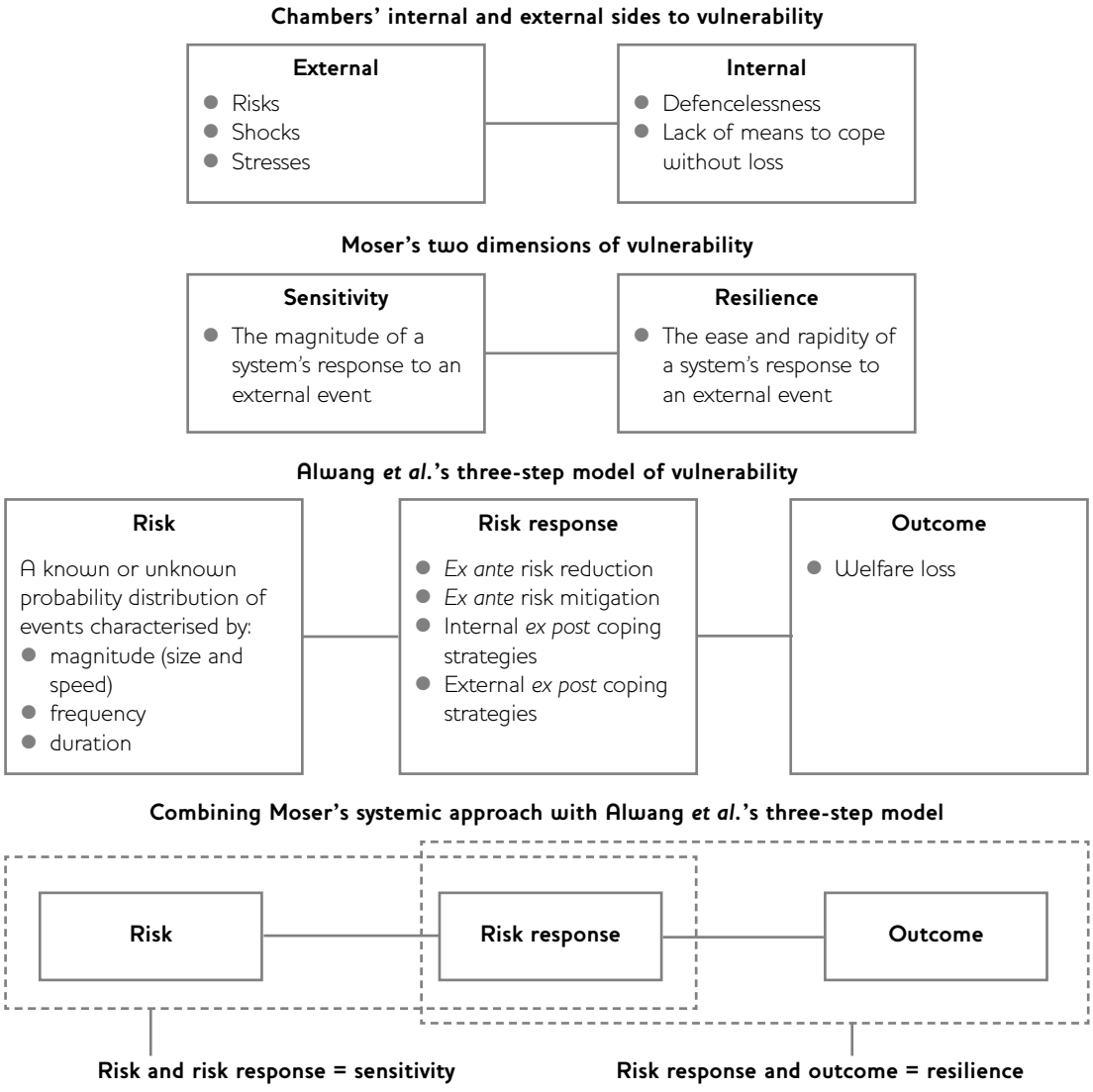
As community-based adaptation often examines the full range and nature of shocks and stresses identified by a community, it is closely linked to conceptual debates about vulnerability.

The starting point in this conceptual debate is the distinction proposed by Chambers (1989), which is similar to our previous discussion on climate risk reduction:

> Vulnerability thus has two sides: an external side of risks, shocks, and stress to which an individual is subject to; and an internal side which is defenceless, meaning a lack of means to cope without damaging loss. (Chambers 1989: 1)

This can be depicted in a simple diagram (see Figure 2). This two-step model has been widely utilised (e.g. Henninger 1998; Webb and Harinarayan 1999; Ellis 2000; Hulme *et al.* 2001). But within the broad vulnerability literature, there have been a number of other approaches (Alwang *et al.* 2001). An

Figure 2 Different conceptions of vulnerability



Sources Chambers (1989); Moser (1998); Alwang *et al.* (2001).

important example is the way Moser (1998) conceptualises vulnerability. While again using a two-step model, Moser uses the concepts of sensitivity and resilience to significantly change the focus and emphasis of Chambers' internal/external distinction (see Figure 2).

As Ellis notes (2000: 62), the application of sensitivity and resilience to vulnerability stems from the fields of agro-ecology and natural resource management (see Blaike and Brookfield 1987; Bayliss-Smith 1991). In this respect, the notion of an ecosystem's 'fragility' to external pressure and ability to 'bounce back' from stress have been applied to individual or household livelihood systems (Ellis 2000: 62–3).

The emphasis in the sensitivity/resilience model of vulnerability is two-fold. The model emphasises the

Table 1 Synthesis of asset-based adaptation framework to extreme weather/disasters

Areas for intervention	Long-term protection: floods/storms	Pre-disaster damage limitation	Immediate post-disaster response	Rebuilding
Actions and institutions	Asset-based actions and institutions/actors			
Levels	Households and neighbourhood Municipal or city Regional and national			

Source Moser *et al.* (2008).

extent and severity of the interaction between the external 'hazard' and the internal 'capability' (sensitivity), and the tensile strength of the 'system' to recover from an external hazard (resilience). The model is therefore less 'fatalistic' than Chamber's internal/external and stresses the importance of the 'capability' of the individual and household to respond to stress. Importantly, Moser (1998) places a great deal of emphasis on assets as the primary factor in determining vulnerability:

> Analysing vulnerability involves identifying not only the threat but also the 'resilience' or responsiveness in exploiting opportunities, and in resisting or recovering from the negative effects of a changing environment. The means of resistance are the assets and entitlements that individuals, households, or communities can mobilise and manage in the face of hardship. Vulnerability is therefore closely linked to asset ownership. The more assets people have the less vulnerable they are, and the greater the erosion of people's assets, the greater their insecurity. (Moser 1998: 3)

The reason why Moser appears to place such an emphasis on assets and capabilities can be illustrated through a further disaggregation of vulnerability. Based on the World Bank's Social Risk Management approach, Alwang *et al.* (2001) propose a simple three-step model for understanding vulnerability: first, risk; second, risk response; and third, outcome (see Figure 2).[3] Using this three-step model, we can understand why Moser places such a great degree of emphasis on assets. It can be argued that sensitivity in Moser's model brings together risk and risk response, while the resilience aspect of her model brings together both the risk response and outcome aspects of this three-step model (see Figure 2). In other words, both sensitivity and resilience rely heavily on risk response (of which assets form a central element). Importantly, the three-step model adds the downstream consequences of being exposed to a shock or stress, and not mobilising the resources to cope with the situation.[4]

To summarise, through disaggregating vulnerability into the risk chain model (risk, risk response, outcome) we can understand why assets can play such an important role for pro-poor adaptation: they are an integral part of the response to hazards. We now turn to asset approaches to poverty reduction to see how this body of literature can inform pro-poor adaptation.

5 Asset-based approaches

One way in which an asset-based approach has been applied to adaptation is the urban asset adaptation framework proposed by Moser *et al.* (2008). This recent and ambitious framework is not only designed to highlight individuals', households' and communities' (lack of) asset holdings (and how these can be supported), but does so through time and at a number of levels. In other words, the asset adaptation framework proposes interventions for different stages of the interaction between a hazard and a vulnerable population – long-term hazard exposure, short-term hazard avoidance, short-term post-hazard resilience, and long-term post-hazard rebuilding – by actors at three different levels: the household and neighbourhood level; at municipal or city level; and at regional and national level (Table 1).

At the heart of the approach is the belief that assets are central to increasing the adaptive capacity of poor urban dwellers in developing countries. The approach suggests three reasons why this is so. First,

that city or municipal authorities will not provide the necessary infrastructure or services to poor urbanites. Second, that many city or municipal authorities are reluctant to work with low-income groups, especially within informal settlements. Third, and as seen above, assets are a vital determinant of vulnerability at the individual and household level. Importantly, the approach believes that improving asset holdings of the poor will increase the likelihood that poor communities can hold local governments, and other actors, to account.

The urban asset adaptation framework is based on conceptual work on assets and poverty (e.g. see Carter and Barrett 2006; Moser 2007; Siegel 2005; Zimmerman and Carter 2003).

In contrast to flow-based measures of poverty – based on income and expenditure which are likely to vary significantly without any change in people's underlying circumstances – a measure of a household's asset, capital or resource base can offer a clearer idea about livelihood strategies, and a closer approximation of who is likely to remain poor in the future. For example, an asset poverty line can identify households which lack the levels of assets required to generate a level of income and expenditure to make them 'non poor' (Carter and Barrett 2006). Moreover, a focus on assets highlights how households respond to risk through deploying asset portfolios prior to, or after, a shock or stress (Alwang *et al.* 2001).

There appears to be two main strands to asset-based approaches in the poverty literature, characterised by the work of Moser (2007) and Moser and Dani (2008) on the one hand, and Carter and Barrett (2006) on the other (although there is a fair degree of overlap between the two).

Moser's (2007) work focuses on how asset-based approaches to social policy can create opportunities for the poor to accumulate assets. Based in part on her own longitudinal work in Ecuador (which integrates anthropological methods – such as participant observation and interviews – with the construction of a survey-based asset index), Moser (2007) highlights how an asset-based approach is distinct from livelihoods approaches (which tend to focus on maintaining livelihoods), and social protection approaches (which tend to focus on reducing risks and shocks). Instead, an asset-based approach to social policy promotes accumulation of assets. Moreover, from this positive perspective, risk is seen not only as a threat, but as an opportunity. In other words, 'managing such risk is about proactively identifying and investing in opportunities, so the biggest risk is not taking a risk' (Moser 2007: 91).

Moser and Dani's (2008) more recent work extends this approach by arguing for a second-generation approach to asset accumulation. In contrast to the rather static provision of sectoral services to boost human capital (health, education) or physical capital (infrastructure), which are seen to provide the 'foundations' for self-propelled asset accumulation by individuals/households, a 'second generation' approach necessitates a dynamic perspective that responds to changing socioeconomic and political circumstances. For example, globalisation, rapid urbanisation and increasing inequality within and between regions and countries. Although not mentioned, climate change is a further case in point.

Moser and Dani (2008) argue that in addition to policies that influence access to assets (such as asset transfers), policies and public action can improve returns on assets (e.g. through improving infrastructure and competition within markets), and radically alter the value of assets (through progressive judicial and institutional reforms).

The second strand in this literature is Carter and Barrett's (2006) work on assets. This is primarily based on the distinction between households who enter poverty temporarily (due to life cycle events or due to shocks), from those who are structurally embedded in poverty. They suggest that an asset poverty line is able to distinguish between structural (due to the gain/loss of assets) and stochastic (due to positive/negative price shocks, or changes in policy) 'transitions' between poor and non-poor conditions, and can split the poor into those likely to stay poor, and those likely to exit poverty.

Of particular importance is the ability of a household to save sufficiently to cross a threshold into high-return activities, termed the Micawber threshold (presumably based on the Dickens' character, Wilkins Micawber, an eternal optimist who was poor but lived in expectation of a better future). As many poor households are unable to limit consumption in the short term, they fail to save sufficiently to cross this threshold (Zimmerman and Carter 2003). Carter and Barrett (2006) suggest that the extent to which

households pursue a savings strategy may be dependent on its distance from the high-return threshold, and boosting a household's asset base can help to reduce this distance, precipitate savings, and entry into high-return strategies.

Importantly, Carter and Barrett (2006) suggest that the severity of shocks is less important in determining the long-term outcome of crisis, than the ability of households to avoid falling beneath critical asset-holding levels. In this respect, social policy should focus more on the asset holdings prior to an interaction with a hazard, as opposed to the strength of a shock (in a similar way to the two bodies of literature outlined above).

The use of asset-based measurements offers a number of insights for pro-poor adaptation. First, the forward-looking and longer-term view of an asset-approach complements the focus on the future required for climate change adaptation. Second, an analysis of the quantity, quality and productivity of assets (and the vital role of market, state and non-state institutions) needed by different types of households provides a useful starting point for developing pro-poor adaptation measures (Siegel 2005). And third, the notion of a Micawber threshold, below which households have so few assets that they are forced to adopt defensive risk-management strategies, offers a floor level above which pro-poor adaptation measures should seek to lift households (Zimmerman and Carter 2003).

6 Concluding comments

Highlighting the importance of assets in a pro-poor adaptation agenda raises four important questions.

First, the changing importance of certain assets under climate change. While bottom-up approaches to adaptation start with current coping strategies of individuals and communities, there is acknowledgement that these may not be sufficient to deal with future changes in climate. For instance, the covariate nature of climate shocks may mean that community-level mechanisms for risk reduction (such as borrowing from family and friends, or disposing of assets) are insufficient.

Second, what types of assets might be required in different contexts? For example, whether a particular region experiences a change in average conditions, or is subject to an increase in the frequency and severity of extreme events, will have a bearing on asset response. And different assets are clearly required in different regions and locations.

Third, should asset holdings be enhanced or diversified? Current debates in climate change adaptation have a tendency to uncritically advocate livelihood diversification as an adaptation measure. Depending on both the context and the livelihood strategies of the particular household, diversification can merely maintain households at a certain level of wealth (Ellis 1998). To be pro-poor, adaptation needs to do more than this. This may require a conceptual shift in views of risk; viewing it as an opportunity and not just as a threat (Moser 2007).

And fourth, while the role of assets and adaptation is being considered in urban spheres, what about rural locations? This is particularly important when one considers that $1-a-day poverty is mainly a rural phenomenon, and will stay that way for two decades at least (Chen and Ravallion 2007).

Assets in urban areas are certainly important. But for pro-poor adaptation to be just and fair – such that poor people benefit more from adaptation measures than the rich – we need to start considering the role of assets in rural locations.

Notes

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1 One culmination of this is the Delhi Declaration, signed in 2002, which saw the creation of special programmes for the least developed countries (Pielke *et al.* 2007).

2 There is also a danger that the poorest might pay a high price from efforts at mitigating climate change (Prowse and Peskett 2008), or might suffer harm from misguided attempts at adaptation to climate (so-called 'maladaptation') (Burton 1998).

3 An approach which is similar to that taken by Watts and Bohle (1993) and Sinha and Lipton (1999).

4 However, in focusing on the outcomes of vulnerability, Alwang *et al.* (2001) conceptualise vulnerability in a relatively static manner. For example, their three-step model does not fully integrate the feedback loops that vulnerability can create: how it changes or inhibits strategies and activities which reduce risk in the short term, but increases vulnerability in the long term (Addison *et al.* 2008). Responses such as reducing food consumption, delaying health or education expenditures, or entering into exploitative patron–client relations, are entirely rational, but can entrap individuals or households in poverty (Addison *et al.* 2008: Ch. 3).

5 While these poverty figures are up to date, recent changes to purchasing power parities (PPPs) suggest that poverty estimates in many poor and emerging economies will rise once these adjustments are incorporated (Milanovic 2008).

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