

Migration as an effective mode of adaptation to climate change¹

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Executive Summary

Within debates about adaptation to climate change, there has been an emerging trend to position migration as an adaptation strategy to environmental shocks and stresses.

Migration may lead to a reduction in vulnerability, through the enhancement of livelihoods; via the reduction in pressure on resources in origin communities; by representing an income source that is not disrupted by environmental hazards; by helping people to better withstand the impacts of environmental stressors; and by providing better access to information and social networks.

Despite these various potential benefits and impacts of migration, little is known about the specific role of migration in the context of adaptation to climate-related stressors.

Whilst financial remittances *may* be spent on both structural and non-structural adaptation measures to reduce household vulnerability to environmental hazards, it is far from clear what circumstances – social, political or economic – are most propitious for this kind of spending. There are knowledge gaps in terms of the conditions that make it most likely for social remittances to play a positive role in building adaptation specifically to climate change. Additionally the costs of migration need to be factored into an assessment of migration as an adaptation.

Migration is a process caused by a range of social, economic and other factors, and not simply an adaptation to climate change. Nonetheless, a variety of examples exist of circumstances where migration has been used as an adaptation to climate-related vulnerability in marginal environments such as dryland margins, mountains and low-elevation coastal zones.

The environmental migration discourse had been overtly focused on the impacts of environmental variability and change, including that of climate change, on migration.

However, the impact of migration on vulnerability and resilience and the manner in which they may offset the impact of climatic event (e.g. role of role of remittances, social network, and skills or knowledge) is often overlooked, despite its importance. Furthermore in the context of the multi-causality of migration there remains the question of the role that migration plays in adapting to environmental stresses on livelihoods in the context of changes in other non-climate factors.

A full assessment of the cost effectiveness of migration as an adaptation strategy requires a number of questions to be addressed: How, and if, the beneficial impact of migration spread from migrant households to the wider community? Does migration as a non-structural mode of adaptation contribute to structural modes?² Does migration reinforce other forms of non-structural adaptation, or does it substitute them? Does migration create additional risks for those involved? What are the long term implications of migration and remittances? How sustainable are remittance flows at the household level?

Policies should aim to create conducive conditions that will allow people to choose to stay or move, and if they move how to best benefit from the process. However, policy responses to address climate change through leveraging migration as a form of adaptation remain scattered and often inadequate.

² See definition of 'structural' and 'non-structural' in text box in Section 2 'Science and Evidence'.

There are a number of areas – development policy, urban planning, settlement policy, remittances, migration policy, evaluation metrics – in which EU external cooperation could play a role in influencing policy in such a way that migration is recognized and/or facilitated as one form of adaptation to climate change.

There remains a significant risk that some populations will experience climate change in the future not by being forced to move, but by being ‘trapped’ in the face of danger.

There are two approaches to such populations. First, facilitate movement, especially for the poorest populations who find it more difficult to move, or if they do move, to move very far. Second, as a policy of last resort, is to consider relocation of populations away from places in which they are in danger.

I. Science and Evidence

Migration as an effective mode of adaptation

The importance of adaptation strategies aimed at reducing vulnerability and increasing resilience in response to the adverse effects of climate change were recognized in the Copenhagen Accord of 2009 (Copenhagen Accord, 2009 cited in Martin 2010:1). Actions taken by individuals, households, community, groups, sector and governments to better cope with, manage or adjust to changing conditions, stress, hazard, risk or opportunity are referred as adaptation. The scale of adaptation varies in physical, ecological and human systems. It could be local, national, regional or global. It ranges from action taken by an individual or household to a particular stress, through those adopted by a community to multiple stresses, to that of the global system to all stresses and forces. This is motivated by factors ranging from protection of economic well-being to improvement of safety (Adger et al. 2005, Smit and Wandel 2006).

Smit et al. (1999:200) suggested that adaptation can be defined based on three questions: '(i) adapt to what? (ii) who or what adapts? and (iii) how does adaptation occur? Yet the climate change literature is replete with definitions of adaptation (see Pielke 1998, Smit et al. 2000, Brooks 2003), which has resulted in a lack of conceptual agreement about what constitutes adaptation to climate change (Callaway 2004). The 2012 IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) defined adaptation as follows:

'In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate (IPCC 2012:5).'

Previous studies have attempted to explore the relationship of adaptation with vulnerability, adaptive capacity and resilience (cf Yamin et al. 2005, Smit and Wandel 2006), identify determinants of adaptation to climate change (cf. Below et al. 2012, McDowell and Hess 2012), discuss decisions that guide adaptation (cf Frankhauser et al. 1999, Callaway 2004), and construct an assessment framework for adaptation (cf Smith et al. 1996, Leary 1999, Smit et al. 1999, Adger et al. 2005).

Within debates about adaptation to climate change, there has been an emerging trend to position migration as an adaptation strategy to environmental shocks and stresses (McLeman and Smit 2006, Barnett and Webber 2009, Tacoli 2009, Foresight 2011, ADB 2012). The vulnerability of a household to climate change is related to its adaptive capacity (access to resources, livelihood strategies, social networks, and accessibility), sensitivity (well being, food and water security, and environmental fragility) and exposure (shocks and stresses) (Gerlitz et al. *forthcoming*). Improvements in these factors can of course reduce reactive forms of migration.

With the recognition of migration as a potential adaptation strategy rather than a failure to adapt, the narrative around migration policy has shifted. An emerging policy concern is on how to support migration-related actions and activities, so that the benefits of migration, such as the delivery of social and financial remittances can be realised by the migrants and origin communities themselves. This refocusing has allowed researchers to explore the role of migration in reducing vulnerability and building resilience to environmental stresses and shocks rather than simply seeking to disentangle the marginal impact of environmental factors or environmental change amongst other determinants of migration.

Types of Adaptation

Adaptation can be anticipatory or reactive, autonomous or planned, structural or non-structural, in-situ or ex-situ, incremental and transformational (Fankenhauser et al. 1999, Smit et al. 1999, McCarthy et al. 2001, Bardsley and Hugo 2010, Kates et al. 2012).

Adaptation that takes place prior to impacts of climate change and that which takes place afterwards is referred to as **anticipatory** and **reactive** adaptation respectively (McCarthy et al. 2001). Over time the behaviour of societies, groups and individuals has adjusted to past climatic changes, and many are considering adapting to the future changes in climatic conditions. Since much of this adaptation stems from the experience of past or current events, it is generally reactive in nature. At the same time, it may be anticipatory to a certain extent as it may consist of some assessment of future conditions (Adger et al. 2005).

The distinctions between incremental and transformative adaptations are not always obvious. Extensions of present actions and behaviours that reduce the losses or enhance benefits of natural variations in climate and extreme events are regarded as **incremental adaptation** to change in climate. In contrast, **transformative adaptations** are adopted at a much larger scale or intensity, are new to a particular region or resource system, and they transform places and shift locations. Like incremental adaptations, transformative adaptations can be reactive or anticipatory (Kates et al. 2012).

Depending on the degree of spontaneity adaptation can be either **autonomous** or **planned**. A deliberate policy decision based on an awareness that either the conditions have changed or are about to change leads to planned adaptation. Such actions are aimed to return to, maintain, or achieve a desired state (McCarthy et al. 2001). If adaptation is spontaneously induced by ecological changes in natural systems and by market or welfare changes in human systems it is referred as autonomous adaptation (McCarthy et al. 2001). Within hierarchical structures actions taking place across various levels interact with each other. Therefore, since individual adaptations are constrained by institutional processes – regulatory processes, property rights, and social norms – they are not entirely autonomous (Adger et al. 2005).

Generally, physical or engineering interventions - river channel modifications, embankments, erosion protection systems, reservoirs and barrages – that seek to prevent or minimize hazard impacts are referred as **structural** measures (Smith 1996, Martinez et al. 2006, Das et al. 2009). In many developing countries, widespread coverage of these structural solutions, despite their effectiveness, is unfeasible due to their financial costs (Parker 1999). The **non-structural** measures are geared towards reduction of exposure or vulnerability to a hazard through efficient use of resources, educative actions, and legislative application of management and organisation (Martinez et al. 2006). These measures are not designed to prevent a hazard, and instead reduce its short- and long-term impacts (Parker 1999, Harries and Penning-Roswell 2010). At macro-level, examples of non-structural measures include formal flood warning systems and evacuation programmes, land-use controls and building regulations on flood prone sites, insurance schemes and relief and compensation mechanisms (Parker 1999, Das et al. 2009). At micro-level, non-structural measures comprise adjustments at the community and household levels such as livelihoods diversification, community-based support networks to provide shelter and food, traditional irrigation management systems, crop management and diversification, and autonomous resettlement (Few 2003, Das et al. 2009, Nadeem et al. 2009, Su et al. 2009).

Migration is a significant phenomenon across the world. It is estimated that around 3% of the world's population live outside their country of origin, whilst the 2009 Human Development Report estimated that at least 11% of the world's population had migrated within their own country (UNDP 2009). Migration may:

- lead to reduction in vulnerability, through enhancement of livelihoods (Adger et al. 2002, Banerjee et al. 2011)
- reduce pressure on resources in origin communities (de Haas 2005, ADB 2012)
- represent an income source that is generally not disrupted by environmental hazards (Paulson 2003, Osili 2004)
- help people to better withstand the impacts of environmental stressors (Suleri and Savage 2006, Yang and Choi 2007) and
- allow for better access to information and social networks (ADB 2012).

A migrant household has a safety net, particularly during crises, due to the diversification (income, sectoral or geographical) of livelihoods (Banerjee et al. 2011). Financial remittances often add to recipient household's income from other sources such as agriculture, livestock, daily wage labour, salary, or business. They are used to procure basic needs (food, housing and healthcare), or are invested in human, social, physical and natural assets (De Haan 2000, Elis 2003). Moreover, cash in the form of remittances is not the whole story. Migrants export ideas, behaviours, identities, social capital, knowledge, and skills from destination to origin communities. These are referred as social remittances (Levitt 1998, Bailey 2010). Their role in promoting innovation, entrepreneurship, community and family formation, and political integration is widely documented (Levitt 1998, Levitt and Lamba-Nieves 2010).

It is noticeable that the narrative of migration as an adaptation strategy has many parallels with that over migration and development and the debate over the conditions during which migration may provide a route out of poverty. Likewise the discourse of migration as an adaptation strategy suffers from the same contestation of structuralism, neo-classical and pluralist viewpoints as discussed by de Haas (2007) with reference to migration and development. Within the migration and adaptation discourse, adaptation 'optimists' and 'pessimists' occupy two ends of a continuum. Adaptation optimists propose that migration could be both an autonomous and planned adaptation. ADB (2012) reported that migration can be considered as a part of the adaptation portfolio mobilised by migrants themselves to cope with climate change as well as a mechanism to reduce poverty and increase resilience in affected area. Displacement of entire communities will occur as a last resort once adaptation possibilities (like in-situ techniques, temporary and permanent migration) and community resilience had been exhausted. Foresight (2011) recognised the significant scope of migration to increase resilience of migrants and those that stay behind. This report postulated that facilitation of migration to broaden the opportunities and maximise the benefits from it; creation of new urban centres that by implication lead to migration from more vulnerable areas; and relocation of large populations from rural and urban areas to places that are less vulnerable to environmental change as probable adaptation options in context of future environmental change and other consequences of climate change (Foresight 2011).

The concept of adaptation, which lays the onus of adjustment on the vulnerable household or social group rather than on the social structures causing vulnerability, has been criticised (Ribot 2011). Along similar lines, the notion that migration can be an adaptation strategy has also been criticised (e.g. Felli and Castree 2012) for its perceived oversight of structural issues that influence individual/community level actions. Felli and Castree (2012) argue that a number of wider issues, including capital accumulation, dispossession, exploitation, oppression, commoditisation, privatisation, liberalisation, market led agrarian reform, debt crisis and structural adjustment programmes, have been overlooked in this discussion. By focusing on individual/ community level actions and market mechanisms as ways of dealing with environmental degradation and climate change, rather than on political-economic transformations, this perspective suggests that 'migration as adaptation' is a neo-liberal approach that misses both the root cause of the problem, and so the scope and source of potential solutions.

In practice, relatively little is known about the specific role of structural factors in the context of adaptation to climate-related stressors. For example, whilst migrant remittances *may* be spent on both structural and non-structural adaptation measures to reduce household vulnerability to environmental hazards, it is far from clear what circumstances – social, political or economic – are most propitious for this kind of spending. A common criticism of remittances is that they are mainly used on consumption. However, there are knowledge gaps regarding implications of such consumption in context of adaptation. There is a need to unpack the term 'consumption'. What constitutes consumption? Does the spending on food and clothing have any positive effect on recipient households during or in aftermath of a disaster? Can the spending on household assets - furniture, utensils, and clothing - that are lost during a disaster considered to be 'unproductive'? Can mobile phones, televisions, radios, and vehicles bought with remittance have unintentional but positive effects in terms of accessibility during disasters? If the spending on gifts reinforces familial and social networks in normal times, can this in turn have an impact on a household's capacity to respond during a disaster?

In turn, there are knowledge gaps in terms of the conditions that make it most likely for 'social remittances' to play a positive role in building adaptation specifically to climate change. For example, there is limited evidence on how farming practices are impacted by migration, at least in terms of how such changed farming practices might build (or reduce) climate change adaptation. In both cases, an important research gap relates to the institutional processes and environment that shapes both the scope for migration as adaptation to take place, and the extent to which it will be proactive or reactive (c.f. Adger et al. 2005). Meanwhile, whilst from a spatial perspective, adaptation can be either in-situ, that is 'in place', or ex-situ, which involves some form of mobility of people, systems and/or assets from a place of vulnerability (Bardsley and Hugo 2010), it is far from clear what determines whether either is chosen as an adaptation strategy, or whether 'optimum' adaptation strategies will be one or the other.

The impacts of migration on community resilience

The IPCC has defined resilience as:

'the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change' (DFID 2011:6).

The ability of a community to cope with external stresses and perturbations without any significant upheaval is referred to as **social resilience** (Adger et al. 2002). The ability of ecosystems to maintain themselves in the face of external stresses and disturbance is referred to as **ecological resilience** (Adger 2000). Resilience at community level can be conceived of as comprising dynamic structures of livelihoods, access to resources, and social institutions. In practice, communities are changing constantly. In this context, communities can be considered as resilient if they are able to absorb the impacts of shocks and stresses, or even respond positively to them (Adger et al. 2002).

There has been little use of the 'resilience' approach in the assessment of migration's role in context of environmental variability and change. Adger et al. (2002) found that in the increasingly deregulated and mobile social environment of a resource-dependent coastal region in northern Vietnam, remittances were offsetting adverse trends in social resilience to some extent through risk spreading and the broadening of opportunities for changes in well-being, with income invested in human and physical capital. There are other examples that may be used as a proxy to illustrate the relationship between migration and social resilience. Evidence suggests that home town associations and diaspora groups have invested in 'public good' facilities such as schools and health facilities (Gammeltoft 2003). Guatemalan Home Town Associations (HTAs) have raised money for crises such as Hurricane Mitch (Agunias 2006). Remittances can increase demand and stimulate local production at micro level (de Haan 2000, Ellis 2003). At a macro level, financial remittances from international sources can offset trade deficits in middle and low income countries, influence sovereign creditworthiness, and are a source of foreign currency earnings (Ratha et al. 2010).

However, certain inherent characteristics of the resilience approach create difficulties in measuring resilience. Analysis of resilience presumes a systemic approach (Nelson et al. 2007), but delimitation of the boundaries of a system in context of migration is a particularly daunting task. Irrespective of their size, communities are highly differentiated in terms of socio-economic characteristics and access to resources (Yamin et al. 2005). Adger et al. (2002) attempted to examine the social resilience of a community, but conceded that the concept of community is problematic. Moreover, whilst the resilience lens had been broadened from 'engineering' resilience to include socio-ecological resilience (Berkes and Folke 1998, Gunderson and Holling 2002), the emphasis of such work still tends to be on bio-physical dimensions. This ignores power relations within human systems that are an outcome of social, economic and political conditions, and expose people to different levels of risk (Cannon and Muller-Mahn 2010, Miller et al. 2010).

Where or under what conditions could migration be an effective adaptation strategy?

Distinguishing climate change adaptation decisions from those induced by other social and economic events can be a difficult task (Adger et al. 2005). The same is true of migration, which is a process caused by a range of social, economic and other factors, and not simply an adaptation to climate change. In turn, adaptation can produce short- and long-term benefits; but it can also generate costs. Even if an adaptation is considered effective for the adapting agent in the short term, it may be less successful in the longer term; it may potentially increase negative impacts on other agents or reduce their capacity to adapt (Adger et al. 2005).

Nonetheless, more conceptual similarities exist between adjustments to cope with climate variability and those to adapt to climate change than there are differences between the two (Callaway 2004). A variety of examples exist of circumstances where migration has been used as an adaptation to climate-related vulnerability in marginal environments. For example:

- **Dryland margins:** Henry et al. (2004) report that short-term rural–rural migration to seek income diversification was a common response during major droughts in Burkina Faso. A significant increase in short-cycle circulatory migration was also reported during the 1983-85 drought in Mali, although migration to international destinations declined during the same period (Findley 1994).
- **Mountains:** Mountain populations have long adapted to living in fragile environments. Drought affected households in Afghanistan have been found more likely to have migrant members than those unaffected by drought (Ghobadi et al. 2005:12). In mountain areas of Northern Pakistan, mobility as an adaptive strategy has a major role in helping the inhabitants to cope with the impacts of environmental threats. This mobility can take form of pastoralism as a part of combined mountain agriculture, episodic mobility in response to natural hazards, or outmigration for jobs and education to diversify the household income structure (Kreutzmann 2012). A study in Chitwan valley of south-east Nepal found that environmental change had a greater chance of influencing local (within Chitwan valley) rather than long-distance (outside Chitwan Valley) mobility. The likelihood of moving within the Chitwan valley was greater if a decline in agricultural productivity was perceived, the share of the neighbourhood covered in flora declined, or time required gathering firewood increased. For long distance mobility, only a perceived decline of agricultural productivity was significant but the effect was considerably less powerful (Massey et al. 2007:15). A study by Banerjee et al. (2011) in flood affected settlements in India, Nepal and Pakistan found that remittances were used to procure food and other basic needs during a disaster and re-establish livelihoods and rebuild lost assets in its aftermath. In few cases, remittances were even used for disaster preparedness such as strengthening of housing quality or procurement of boat in flood affected communities. In the Ethiopian Highlands, labour migration has also been found to be a key coping strategy following drought, with the poorest most likely to migrate (Gray and Mueller *forthcoming*).
- **Low-elevation coastal zones:** In the context of sea-level rise, coastal areas are increasingly vulnerable to erosion of habitats, salinisation of low-lying soils, and flooding from coastal storms. A case study of Bangladesh found that a majority of households already send a member to work temporarily in response to destruction caused by cyclones or floods, or increased salinity due to encroaching sea levels (Penning-Rowsell et al. 2011/CS4). Migration is usually an outcome of a household decision, generally, motivated by a desire to secure household incomes through diversifying risks. Remittances have increased after cyclones, as in the case of several Samoan cyclones. These had been used to purchase food, rebuild houses, replant plantations and supplement lost income (Sutherland et al. 2005, Naik et al. 2007).

In each of these cases, there is evidence of the effectiveness of migration as a form of adaptation in terms of its persistence as a strategy adopted by those facing deteriorating or extreme environmental circumstances. Yet across such vulnerable locations, there is a lack of specific empirical studies on the role of migration in context of adaptation to environmental variability and change. Relatively, little attention had been paid to the changes in movement of labour between rural and urban areas due to the climate change impacts on rural livelihoods

(Cannon et al. 2010) and the role of mobility as a coping and adaptation strategy (Agrawal and Perrin 2008). So far, even the environmental migration discourse had been overtly focused on the impacts of environmental variability and change, including that of climate change, on migration (Barnett and Webber 2009). However, the impact of migration on vulnerability and resilience and the manner in which they may offset the impact of climatic event is often overlooked, despite its importance.

In addition, unlike many dryland and mountain regions, many coastal zones have historically experienced in-migration. Continued migration to coastal cities may lead to fewer income opportunities, and many people are moving to more vulnerable locations with regards to future environmental change. For example, many of the largest cities in Asia are located in floodplains or cyclone-prone coastal areas (Foresight 2011). In this context, far from representing adaptation to climate change, migration may contribute to the challenges of adaptation.

The cost-effectiveness of migration as adaptation

As noted in the previous section, there has been little empirical research attention paid to date on the feedback from migration in context of adaptation such as the role of role of remittances, social network, and skills or knowledge. As such, it is not straightforward to draw conclusions, at present, on the cost-effectiveness of migration as a form of adaptation to climate change. Rather, a full assessment of this requires a number of questions to be addressed:

- Does the effect of migration spread from migrant households to the wider community?
- Does migration as a non-structural mode of adaptation contribute to structural modes?
- Does migration reinforce other forms of non-structural adaptation, or does it substitute them?
- Does the effect of migration on structural and non-structural modes of adaptation vary depending on the phase in migration cycle?
- Does migration create additional risks for those involved?
- What implications does migration as an adaptation strategy to climate change have towards adaptation to other stressors, both environmental and non-environmental stressors?
- How do differential impacts of migration between men and women play out in the context of climate change?
- What are the long term implications of migration and remittances?
- How sustainable are remittance flows at the household level?

Migration is a multi-causal and complex phenomenon. A concept such as 'environmental migrants', which assumes that migrants move because of one single determining factor is methodologically unsound and unhelpful for policy responses. Rather, policymakers require information about kinds of people who might migrate in various environmental situations, whether such flow will be new or follow existing migration routes, reasons for some people to migrate while others do not, and impacts on people who do not move. An alternative is to

explain first, what drives migration, and then focus attention on how environmental change might influence these migration drivers in the future (Foresight 2011). The widespread focus on the influence of environmental and climatic stressors on migration behavior in the migration-adaptation discourse increases the risk of overlooking the contribution of migrants who may not have been influenced by these stressors, towards reduction of vulnerability or increase in resilience in context of environmental variability and change. For example, in a flood-affected community, only migrants whose migration decision was influenced by the flood impacts would be considered as 'environmental migrants'. Yet even a migrant who is not moving in response to actual or anticipated environmental change or stress can potentially contribute towards disaster relief, recovery or preparedness in the community of origin. As such, a wider set of migrants have potential role in adaptation context.

The urban framing of this issue is of significance since a considerable proportion of migrants move to urban areas. This may exert greater pressure on urban infrastructure, housing, sanitation, water supply, transportation network, health care, and social welfare. Due to the growing influx of migrants between 1992 and 2001, the city of El Alto in Bolivia failed to provide basic services to an extra 132,000 people (O'Hare and Rivas, 2007). Low-income migrants and their families often live in sub-standard housing, mainly in slums, with poor access to basic services such as clean water, sanitation, health care, education, and public distribution systems (Mahadevia, 2002; Deshingkar and Anderson, 2004, Liang and Ma, 2004). Besides, migrant workers may compete with members of the host community from similar socioeconomic backgrounds for jobs and access to resources (Zhang and Song, 2003; Unruh 2004,). If migrants belong to a different social group – ethnic, linguistic, or religious backgrounds – than that of the host community, they may be perceived as a threat to the local socioeconomic fabric. This can lead to conflict between the host community and migrants (Collier 2000, Mahajan et al., 2008).

For some time, megacities have been associated with a rise in hazards (Mitchell, 1999). However, the vulnerability of small cities and rural communities is potentially higher than big cities or megacities since the former have limited resources and are often a lower priority for government spending (Cross 2001, IPCC 2012). Highly vulnerable urban communities have emerged, especially in developing countries, due to informal settlements and inadequate land management (IPCC 2012). Vulnerability to disaster risk has been exacerbated by rapid and unplanned urbanisation processes in hazardous areas (Sanchez-Rodriguez et al. 2005). Some areas may become increasingly marginal because disasters may occur more frequently and/or with greater magnitude. This may introduce new pressures in areas of relocation if migration or displacement from marginal areas becomes permanent (IPCC 2012). Despite immediate benefits from a rise in income, actual risk may increase in the long term for migrants moving to such vulnerable urban communities. Because of a lack of empirical evidence the change in vulnerability of a migrant due to climate change impacts in destination remains unclear.

2. Policy implications for the EU

In response to climate change, many governments seek to adopt in-situ strategies for adaptation – agricultural practices, management of pastoral lands, infrastructure like dykes and coastal barriers – as ways to reduce migration pressure and let people remain in their origin communities (Martin 2010). Yet framing migration as a failure or threat results in policies that limit the benefits from migration to those involved (de Haan 1999, de Haas 2007, Kothari 2003). For example, Adhikari and Hobley (2011) reviewed Swiss Development Cooperation (SDC) to support project-based interventions in Khotang district of Nepal. They concluded that these projects – small-scale irrigation, road building, farm based activities and forest

interventions – are based on economic and political context of the past that have little relevance in present times. There was an implicit assumption that outmigration was not in the best interest of the local society, and therefore efforts had to be made to make people want to stay. However, there was little interest, particularly among the young generation, to continue the previous generations' way of life. These young people were either absent or wanted to move away.

In contrast, over the past decade, the issue of environmental change and migration has garnered an upsurge of interest from researchers and policy makers (Stern 2006, Action Aid International 2007, Christian Aid 2007, Laczko and Aghazarm 2009, Jäger et al. 2009, Warner et al. 2009, ADB 2012, Foresight 2011), with increasing attention to policies that should aim to create conducive conditions that will allow people to choose to stay or move (ADB 2012). For example, the recent Foresight report on Migration and Global Environmental Change (Foresight 2011) highlights that:

- Migration is a key way for individuals to increase long-term resilience to environmental change, and offers scope for 'transformational' adaptation
- A proactive policy towards migration influenced by environmental change is most likely to achieve outcomes that maximise benefits to individuals, as well as source and destination communities
- Development policies should not be based on a presumption that people should stay where they are, especially if that involves staying in increasingly vulnerable locations
- In some cases, urban planning challenges in existing settlements are sufficiently severe that the establishment of new urban centres is likely a more durable long-term solution.

In addition, Bardsley and Hugo (2010) have argued that the effective management of migration influenced by climate change could minimise humanitarian crises, avoid conflicts, and provide opportunities for the migrants to ensure their own well-being and that of their households, and regions of origin and destination. All of these conclusions are relevant in a context where EU policies on adaptation to climate change are under active development, and could recognise migration as a form of adaptation, rather than assuming or hoping that it can be averted by adaptation.

Policies around the world have already started to take such an approach on board. For example, a review of 38 National Adaptation Programmes of Action (NAPA) reported that a number cited examples of migration being used as a coping strategy when environmental events impinged on people's livelihoods and security. The NAPAs of Bangladesh, Cambodia, Ethiopia, Eritrea, Gambia, Haiti, Mali and Uganda all mention labour migration from households affected by drought or floods (Martin 2010), although they do not consistently view this as a positive form of adaptation.

Moreover, policy responses to address climate change through leveraging migration as a form of adaptation remain scattered and often inadequate. This is partly due to the lack of reliable data on migration in general, and those related to environmental stressors in particular. Moreover, the nature of relationship between environmental change and migration is yet to be fully comprehended.

The role for EU external cooperation on this issue

There are a number of areas in which EU external cooperation could play a role in influencing policy in such a way that migration is recognized and/or facilitated as one form of adaptation to climate change:

Development policy: Most obviously, the EU's substantial development policy interventions should not be based on a presumption that people should stay where they are, or indeed be assisted to do so. On the contrary, the costs and benefits of specific policies that would enable people to move to build a better life elsewhere should be considered alongside policies that would assist people to remain where they are. It is particularly important to give due weight to the perspectives and wishes of people most directly affected.

Urban planning: Where people are moving, or are likely to move, there is a role for the EU to assist in the development of appropriate planning institutions for cities, ensuring that migration is an integral factor in planning processes. There is considerable historical experience within Europe itself in planning for rapidly growing cities, including planning that might enable growing settlements to contribute to *reduction* of per capita carbon emissions (e.g. through efficient design of energy and transport systems) rather than its increase.

Settlement policy: Over a longer time period, there is a need for some countries and regions to consider their overall settlement structure, to avoid an unsustainable 'lock in' to settlement in increasingly precarious locations, and to help deliver more sustainable cities. Such a policy needs to pay attention not only to technological options for sustainability, but also to regulatory frameworks to minimize land conflicts and unintended environmental damage.

Remittances: There is evidence that migration can support local transformations and increased resilience of those remaining behind in local communities through remittances. However, sending remittances often remains costly, especially where it involves relatively small sums sent on a regular basis. One way for EU policy to address this is to encourage and support initiatives based in the micro-finance and telecommunications to facilitate remittances, including providing support for high quality regulation of such sectors. Another approach is to facilitate the physical circulation of internal migrants, for example through improving urban-rural transportation connections.

Migration policy: Barnett and Webber (2009:e7) note that since internal migration is the most likely outcome for those affected by climate change and other environmental hazards, a higher priority should be given to this (e.g. urbanization) than to international migration. Nevertheless, some international migration may occur, or indeed be needed, especially in the context of island nations that are vulnerable to sea level rise.

Adaptation policy: In contrast to climate change mitigation, the effectiveness of adaptation projects so far has not been evaluated according to universally accepted metrics. Without these metrics, it is argued that adaptation finance vehicles such as the Adaptation Fund under the Kyoto Protocol will encounter challenges when trying to compare the adaptive effect of ongoing or proposed projects in order to achieve an efficient allocation of their funds (Stadelmann 2011). Previously evaluations of adaptation based programs have followed that of development assistance projects by focusing on intermediate outcome indicators and placing less emphasis on final impact metrics. In the main this is due to difficulties in the prediction and measurement of indicators at longer time scales due to the large uncertainties of future climate patterns and impacts and the influence of other socio-economic variables (Hinkel 2008;

Hallegate et al 2011). Future comparisons between large-scale structural adaptation projects and that based around migration requires not only the development of universal metrics to compare the various social, economic and environmental consequences of different adaptation strategies, but development of modeling capacities to determine the longer term patterns of change and impacts.

Capacities at national and regional level to enable migration as an adaptation strategy

The extent to which there is adequate national and regional capacity to enable migration as an adaptation strategy can be addressed in relation to each of the distinct policy areas outlined in the previous section. However, this section focuses on national and regional capacity to regulate migration, and in particular the extent to which changes to existing legal frameworks are necessary in order to accommodate increased or changed migration patterns in the future. This relates in particular to international migration within regions, which is both a likely outcome from climate change in some regions, but also a potential form of adaptation that could bring substantial benefits.

An initial problem here is that currently there is no international legal framework that specifically targets people moving or displaced in the face of climate-related disruptions or threats (ADB 2012). This is not to say that there are no international legal frameworks governing movement; the Geneva Convention on Refugees provides for those displaced across international borders, but it does not – and arguably could not – apply to those displaced by environmental factors. Somewhat more optimistically, regional conventions such as the Kampala Convention (for Africa) and the Cartagena Declaration (for Latin America), do include provisions to address ‘environmental migration’, although no similar instrument exists for Asia or the Pacific.

However, perhaps more important is capacity to ensure that current migration channels are sufficiently strong to accommodate increased migration in the face of climate-related risk. Improved regulation and facilitation of migration could be based on a number of precedents. One example is the promotion of circular migration by the EU in the form of ‘mobility partnerships’, currently agreed with Moldova, Cape Verde and Georgia, but which could in theory be extended to states more vulnerable to climate related risk. Such partnerships include provision for multiple-entry visas, giving priority to former migrants when granting new residence permits for temporary employment, and setting up a database of third country nationals who have left the EU following expiry of a residence or work permit.

The EU could also use its experience and resources to support such initiatives in other regions of the world, drawing on its own experience, and that of others. For example:

- **New Zealand** has long offered preferential migration to Pacific islanders - it has granted citizenship to residents of some islands (Cook Islands, Niue and Tokelau) a quota based route to permanent residence for others (Samoa, Tuvalu) and seasonal work opportunities for others. Its Recognised Seasonal Employer (RSE) scheme brings in around 8,000 Pacific Islanders each year to New Zealand, and extensive evaluation has found benefits for both migrants and sending and receiving countries, from both a domestic and international perspective. The findings of the evaluations have been overwhelmingly positive.
- The **India-Nepal Treaty of Friendship** of 1950 created an open border between the two countries, allowing visa and passport free entry and access to employment without a work

permit. Any citizen of either country can migrate to the other country and stay for as long as desired (Subedi 1991; Adhikari et al., 2008). For areas such as the Far West of Nepal, the cities of the northern Indian plains are geographically closer than Kathmandu and the cities of central Nepal (Skeldon, 2011). For the poor, even the acquisition of official migration documents such as a passport, is often an insurmountable hurdle (Hoermann and Kollmair, 2008). The open border between Nepal and India permits the use of any national identification document (electoral identity card or driving license) for entry.

- The Temporary and Circular Labour Migration (TCLM) programme between **Colombia** and **Spain** is another innovative migration model. The programme had originated to respond to the gap in labour supply in the agricultural sector in the region of Catalonia in Spain. The Unión de Pagesos (UP), the main agricultural trade union in Catalonia, selected beneficiaries in Colombia and took care of the logistics for seasonal migrant workers. The programme targeted various vulnerable groups in Colombia including those affected by environmental disasters (see Engelman, 2009; Magri, 2009; de Moor, 2010; IRIN, 2010).

The policy objectives of these initiatives were not to promote adaptation to climate change. Yet, their impacts have potential to reduce vulnerability or increase resilience, which in turn could support their beneficiaries to adapt. A complete assessment of the adaptation potential of these policies is required to identify their benefits and address the risks.

Addressing the case of trapped populations and most vulnerable persons

Even if the measures discussed in the previous two sections were to be adopted, there remains a significant risk that some populations will experience climate change in the future not in the form of being forced to move, but in the form of being ‘trapped’ in the face of danger. As a recent study for ADB (2012: 46) concluded:

‘When faced with environmental disruptions, the poorest populations are often unable to move and can only migrate very short distances. ... the very poor often don’t have access to the resources that would enable them to move, and are thus deprived of migration options. Climate change is further expected to reduce these resources.’

There are two approaches to such populations. A first drawing on the measures highlighted above, is to facilitate movement, especially for the poorest populations who find it more difficult to move, or if they do move, to move very far (Amin 1995). A second, relevant as a policy of last resort, is to consider relocation of populations away from places in which they are in danger.

The notion that it might be necessary to relocate populations away from places endangered by climate change has already attracted policy attention. For example in Papua New Guinea, around 1,000 people have been moved since 2003 with direct government support away from areas threatened by sea level rise; whilst at another extreme, in China, population resettlement has been a central part of policies relating to poor populations in environmentally vulnerable settings since 1983, with as many as 4.4 million people voluntarily moved with official encouragement in Gansu province alone, and many more moves planned.

However, a number of lessons can be learned from these and other resettlement experiences, including:

- Carefully planned movement is clearly superior to hastily organized and under-resourced resettlement.
- Funding needs to be secured well in advance, as relocation is often very expensive (Li et al. 2004; Liu 2007) and few developing countries have the funds necessary for relocation (ADB 2012).
- Discussion about ‘inevitability’ of relocation – as in case of island communities – can undermine the confidence of investors, donors, and local people leading to stagnation of economy and unsustainable use of resources (Barnett and Adger 2003).
- Large-scale movement of agricultural populations to another agricultural area is at best high risk, and unlikely to be conducive to permanent transformation of living conditions.
- The issue of economic livelihoods at destination areas is not easily resolved
- Resettlement programmes are sometimes marred by ethnic conflicts between settlers and hosts (Martin 2010).
- Resettlement should be voluntary, in that participation can be refused.

Taking the example of Gansu province in China, while material living conditions appear to have improved for some resettled groups, with considerable investment in public services, some have observed that this has increased the dependency of such populations (Rogers and Wang 2006, Liu 2007). Movement of people into agricultural lands elsewhere has raised issues of land scarcity and insecurity of land tenure.

In the absence of migration or resettlement, the consequences of populations remaining ‘trapped’ in the face of climate shocks remains unclear. At an individual and household level, such trapped populations live at best at risk of substantial challenges to their livelihoods, and at worst at risk of death. Yet whether there are wider consequences for society in terms of economic well-being and security is less certain, not least as the economic and political ramifications of migration and displacement are themselves complex.

Examples of good practice

Migration outcomes are counter-cyclical in nature. During natural disasters, macro-economic or financial crises, and armed conflicts remittances are known to be a relatively stable source of household income (Mohapatra et al. 2009). Remittance transfers to recipient household usually increases after disaster events, but with a lag (Attzs 2008). In October 1998, Hurricane Mitch hit Central America. Its impact was particularly severe in Honduras and Nicaragua, but Guatemala, El Salvador and Belize were also affected (Kugler and Yuksel 2008). Migration was a major response strategy to this disaster adopted by the local populations. International migration from Honduras had tripled and that from Nicaragua had increased by 40% (FAO 2001). The US government granted Temporary Protected Status (TPS) to the residents of Honduras and Nicaragua who were in the United States at the time of the disaster, even if they were unauthorized at the time or had expired visas. During the protected period they could not

be deported and were eligible to work in the USA (Kugler and Yuksel 2008, Newland 2011). Such protection allowed Honduran and Nicaraguans to work and send remittances to their families. By 2003, almost 150,000 Hondurans and Nicaraguans had received TPS (Kugler and Yuksel 2008). Remittances increased to 13.6% of GDP in 1999 due to Hurricane Mitch (Andersen and Christensen 2009:5).

The same was also noticed in Honduras in the year after Hurricane Mitch (Mohapatra et al. 2009). The TPS was set to expire in March 2012 (McKenzie and Menjivar 2011). At present, immigration concessions for victims of natural disasters are generally ad hoc. Using micro-level household survey data, Mohapatra et al. (2009) found that per capita household consumption in the period after a flood in Bangladesh was higher for remittance recipient households. The same study found that households in Burkina Faso and Ghana that received international remittance, particularly from high income OECD countries had better housing quality and greater access to communications, which helped in coping during natural disasters. In Ethiopia, the same study found that households that received international remittances relied more on their own cash reserves during shocks to food security rather than on selling of productive assets.

3. Policy recommendations

The policy recommendations in this final section draw on the conclusions of this paper, as well as on insights derived from a policy roundtable held in Brussels on 9 July 2012, and involving a range of participants from international organisations, government, development practitioners and academia. It is recommended that policy at EU and government level pay attention to the following:

- Support for inclusion of the positive potential of migration as a form of adaptation in key climate change (adaptation) forums (such as UNFCCC)
- Support for development projects and policies that help people to exercise choice over whether they stay where they are, move elsewhere, or return, rather than presuming that migration needs to be prevented or enforced.
- Support to the creation of zones of free movement where climate-related vulnerability is high. This might include promotion of bilateral agreements to facilitate circular migration in times of extreme climate events.
- Support to eliminate hidden barriers to internal migration through appropriate development policies - e.g. reducing barriers to the transfer of social protection benefits
- Shifting the focus of policy development from “environmental migration” to those who migrate in the context of environmental change, either in sending or receiving areas.
- Support for local governments in cities and smaller towns to increase their technical capacity, democratic accountability and financial revenue so that migrants to urban areas do not become more vulnerable as a result of their migration. This might include promoting efforts to sensitise migrants to new environmental risks posed in destination areas.
- Support for further research as well as pilot projects to explore the potential of migration as a form of adaptation to climate change.
- Measures to ensure coherence between the migration and development agenda and the climate change and migration agenda at the 2012 Global Forum on Migration and Development and at the 2013 UN High Level Dialogue on Migration and Development.
- Measures to improve the efficiency of remittance channels, and to incentivise the investment of remittances in initiatives designed to reduce vulnerability to climate change. This might include exploration of ways in which remittances can be leveraged to boost investments that encourage social resilience.
- Support for local and national governments in low and middle-income countries to expand their urban areas without significantly or unnecessarily increasing their carbon emissions. This implies technical and financial support to enhance urban planning.
- Opening access to health, education and social services to internal migrants where this is currently unavailable.

- Support the Nansen Initiative of Norway and Switzerland to address legal and protection gaps for people displaced across borders in the context of environmental change and extreme weather events.
- Development of an integrated approach to adaptation, disaster risk reduction (DRR) and development as a way of addressing displacement associated with environmental extremes.
- Support to enhance humanitarian response and long-term resilience.

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