

Chapter 2

Human Mobility in a Socio-Environmental Context: Complex Effects on Environmental Risk

Lorenzo Guadagno

1 Introduction

Mobility has been a constant feature of human communities and societies in any place and time. From the worldwide spread of the early *Homo sapiens* groups, all the way to modern migration flows in response to industrialization, urbanization and globalization processes, human mobility has shaped the world, underpinning the circulation of ideas, knowledge, and goods on short and long distances.

The magnitude of today's population flows is however unprecedented. There are in the world around one billion migrants (UNDESA 2013; UNDP 2009), and many more people move on short distances and on a temporary basis—their movement largely elusive to mobility tracking systems (Tacoli 2013). Mobility contributes to determining global and local distribution of people; location, size, density, and composition of communities; and individual access to livelihood and well-being options (Schensul and Dodman 2013). It is a key cultural, social, economic dynamic of our modern societies, both a consequence and a driving force of modernity itself (Castles and Miller 2009).

Population flows are an essential feature of the continuum of human interactions with the environment (Sanderson 2009). It is through staying in and moving into places that people access environmental resources and opportunities, and are exposed to hazardous events and processes (Wisner et al. 2012). On the other hand, population flows, and the circulation of material and immaterial resources they induce, contribute to reproducing or challenging the socio-environmental relationships that determine access to those opportunities and hazards (Castles

L. Guadagno (✉)
International Organization for Migration, 17, Route des Morillons, CH-1211 Geneva 19,
Switzerland
e-mail: LGuadagno@iom.int

and Miller 2009). Mobility is at a time the expression and a determinant of spatial hierarchies of opportunities and risks (Skeldon 2008), including environmental ones.

Human mobility is embedded in a number of processes, including environmental change, conflicts, economic growth and crises, political and cultural evolutions taking places at all geographic scales (Black et al. 2011; Castles 2010). But it is through localized socio-environmental transformations that it is determined—and determines most of its effects on risk. Mobility transforms risk landscapes by linking places into translocal geographies (Brickell and Datta 2011). Population and resource flows decouple people's agency from localized socio-environmental conditions, creating a context for individual choices and opportunities that is rooted on and influenced by broader and more or less distant relations and dynamics (Greiner and Sakdapolrak 2012). As a consequence, social and environmental relations in the sites of origin and of destination are transformed. Mobility is therefore a key dynamic to the socio-environmental relations that produce risk.

Disaster risk reduction (DRR), the set of efforts aimed to analyze and reduce the factors that determine the human, material, economic, and environmental impacts of hazards, provides a specific theoretical and operational look on these relations, and the way mobility transforms them.¹ DRR aims to understand how socio-environmental processes produce or reduce vulnerability and risk: this requires understanding human mobility's role in shaping exposure, vulnerability, and resilience to environmental hazards. On the other hand, DRR aims to prevent these processes from resulting in disasters: this requires creating the conditions for mobility decisions to empower people to better avoid, absorb, and recover from, shocks and stresses.

While a number of theoretical perspectives on population movements provide useful elements to a risk reduction discourse, a specific, encompassing DRR perspective seems to be largely missing from the debate on migration, displacement, relocations, and other population movements. Some human mobility issues have recently been integrated in the Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR). However, a comprehensive look on mobility as an underlying dynamic of risk is still absent from the DRR policy and operational agenda. This paper, based on the review of existing literature on migration, development and the environment, attempts to propose a theoretical framework to interpret mobility from a DRR angle. This should help identify some key questions and recommendations that could be useful to better integrate understanding and management of human mobility into DRR policy, research, and practice.

¹For the aim of this paper this definition includes Climate Change Adaptation (understood as a subset of actions to reduce the impacts to a specific range of hazards).

2 A Livelihood Approach to Mobility and Risk

Livelihood strategies provide a useful key to interpreting the linkages between risk and mobility.² Livelihood choices are based on individual capacities to access human, social, physical, financial, and natural resources, but are part of complex well-being strategies defined at the level of more or less large households. The options concretely available to individuals and households are constrained by social and environmental factors: legal and political frameworks, economic dynamics, cultural specificities, and ecosystem features determine whether people are allowed or denied access to capital and opportunities, and define the boundaries of the choices they have concretely available (Sen 2000).

DRR theory (Wisner et al. 2004) looks at access to resources and livelihood strategies to determine where and how people work and live and the amount of material and immaterial resources they are able to draw upon to avoid or face a shock. Livelihood choices determine people's likelihood to be impacted by hazards, the degree of damage they are likely to sustain, and their capacity to cope with, and recover from, shocks.

The livelihood perspective is just as central for the mobility discourse. Understanding mobility choices in the context of household-level livelihood strategies helps highlight how they result from the different set of aspirations, opportunities, and constraints with which different people are faced (Mc Dowell and De Haan 1997). This perspective overcomes more deterministic approaches based on costs and benefits or on push and pull factors of movement, and reduces the need for defining categories of mobile people and population movements: "forced" and "voluntary" moving and staying are different outcomes of the same multi-causal decision-making process aimed to maintain and improve collective well-being, based on the integral consideration of existing opportunities and constraints (Black et al. 2012; de Haas 2008a, b).

The collective dimension of livelihood strategies is particularly relevant for the integration of mobility and risk reduction. Mobility choices are part of household-level decision-making processes, as they are pursued for collective projects and purposes, based on mutual obligations and commitments. Mobility allows for resource diversification, livelihood strengthening, and risk management within the household (Stark and Bloom 1985). At the same time, population movements modify the individuals' availability of resources and opportunities, producing different outcomes for different people in locations of origin, transit and destination, and beyond (Stark 1991). It is therefore difficult to single out "positive" and "negative" forms of mobility; mobility choices should rather be investigated to

² A livelihood comprises the capabilities, assets, and activities required for a means of living. It is sustainable if it can cope and recover from stresses and shocks and maintain capabilities and assets, while contributing net benefits to other livelihoods in the long and short term (Chambers and Conway 1992).

understand how their positive and negative effects are distributed and interplay with existing patterns of vulnerability and risk.

Two main analytical implications stem from applying a livelihood-centered approach to the study of mobility and risk: (1) the need to look at all mobility and immobility decisions and patterns for their potential of creating or reducing risk; and (2) the need to adopt a comprehensive view on risk outcomes of these decisions. These considerations inform the theoretical framework illustrated in the next section.

3 Mobility and DRR: A Theoretical Framework

Figure 2.1 outlines the progression from livelihood choices to risk dynamics, highlighting mobility patterns and related resource flows, as well as their potential outcomes that are relevant for risk reduction at different levels. The model depicts a one-on-one linkage between two socio-ecological systems. Even though in reality multiple mobility decisions are likely to create a network of population and resource flows among interconnected locales, the inclusion of more than two sites in the diagram would not add perspective to the identification of mobility-related risk outcomes.

The model highlights how, within each system, mobility choices are embedded in households' livelihood strategies. Resources, opportunities, and constraints people base their choices on depend on demographic, cultural, social, political, economic, and environmental features of the system they live in. These features, specific to any given historical and geographical context, are influenced by large-scale dynamics, such as capital accumulation, crises, structural reforms, and globalization of economies and cultures. All these dynamics interact to multiply or limit the resources and opportunities that are accessible to different households and individuals. Global environmental change, including climate change, is one among these dynamics, likely to have significant impacts on people's well-being options through its interplay with local socio-economic structures and processes.

The centrality of environmental features in mobility choices has been highlighted by the research on migration and the environment, which has mainly focused on environmental drivers of mobility and environmentally driven movements (among others: Foresight 2011; McLeman 2014; Piguet 2010). However, findings of this body of work show that environmental dynamics and economic, political, and social structures always interact to determine people's decisions. Looking at community and system-wide structures and processes is therefore necessary to understand mobility patterns and outcomes (Castles 2002; Felli and Castree 2012; Zetter and Morrissey 2014).

Research also shows that population movements are never the inevitable, nor the inevitably negative consequence of stresses and change. Before, during, and after events of any kind, mobility behaviors inevitably differ (McDowell and de Haan 1997). This is the case even in sudden-onset, catastrophic disasters, which may

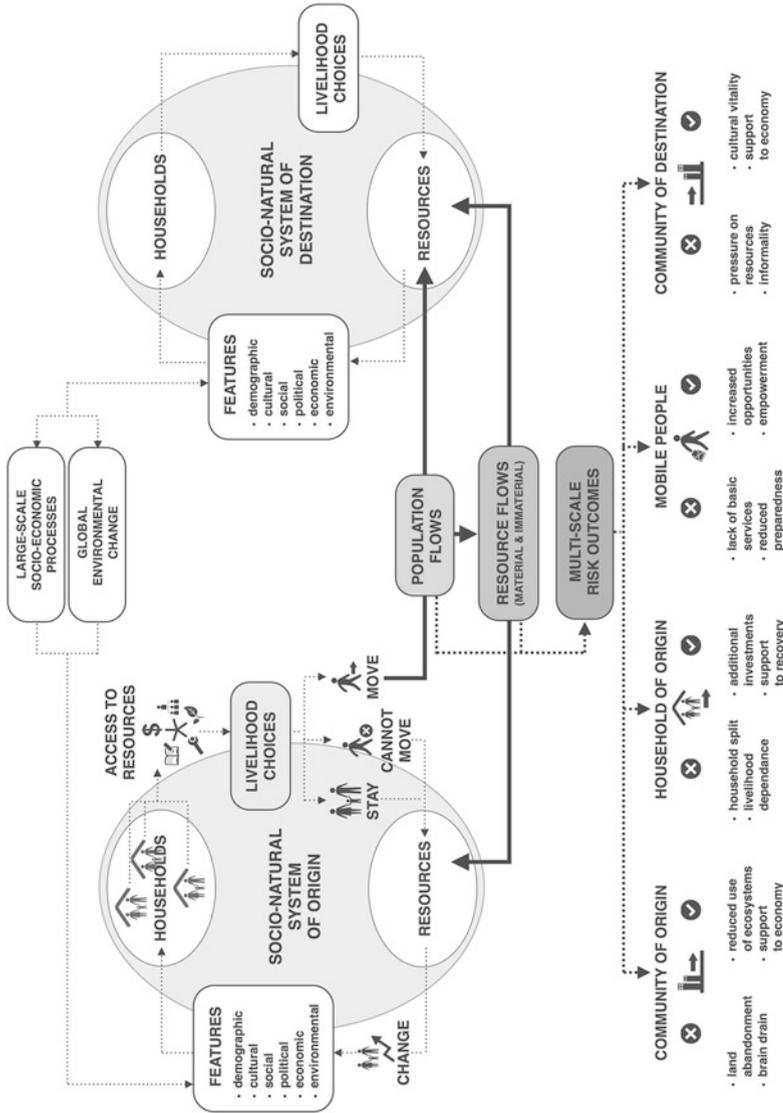


Fig. 2.1 Livelihood choices, translocality, and risks. Source: author's own elaboration. Icons: UNOCHA

produce intense shifts in local resource availability and affect in similar ways a sizable number of people, thereby inducing a massive, concentrated mobility response: some people are free to stay, some people move, some people cannot do so.

Both the need and the capacity to move of different people depend on the same social, economic, and political variables that define vulnerability and resilience to disasters (de Haas 2008a, b). Hence there is no univocal relationship between shocks and mobility. The capacity to resist and withstand negative impacts can translate in being free to stay in a place, while not being able to move can expose people to disproportionate losses and translate in longer-term vulnerabilities (Black et al. 2012; Fussel et al. 2010; McLeman 2006). On the other hand, local stressors can hinder, rather than stimulate, population movements, reducing access to assets and resources that are needed to move (Findley 1994; Kniveton et al. 2008), while successful responses to shocks and change, by maintaining or improving available resources, can help sustain or strengthen outbound population flows (Sakdapolrak et al. 2014; Tacoli 2009).

These alternatives lie along a continuum of more or less forced and more or less voluntary mobility and immobility, which contribute to determining people's in situ and distant livelihood options. Moving is part of the strategies households can pursue in order to pursue well-being outcomes, in a context of more or less limited choices and significant tradeoffs (Hugo 2008; McDowell and de Haan 1997). In fact, even fleeing in the face of an immediately life-threatening event or process is an option that allows preserving essential assets and resources and improving otherwise bleaker prospects, and an appropriate response to specific conditions of risk (Schensul and Dodman 2013).

While it is always determined by the interplay of local and distant social and ecological pressures and factors, moving is only a viable option for those local and distant who can face the material and immaterial costs linked with movement (Black et al. 2012). These are determined by a variety of individual and contextual factors, including laws and regulations that restrain population movements, accessibility of infrastructure and availability of information, discrimination, marginalization and xenophobia, physical integrity, and access to supporting social networks. The capacity to move is itself an attribute of resilience, while constraints to people's freedom to move to (or stay in) places are likely to create vulnerability.

From a DRR point of view, the key question is to understand how (im)mobility choices produce different outcomes on the well-being of different individuals and households, perpetuating or modifying their capital endowment, hazard exposure, and available opportunities. This includes analyzing how such choices contribute to reproducing and transforming the socio-environmental relations that define the systems' features, influencing local and distant people's opportunities and constraints.

The transformative effect on these system-wide features is not unique to mobility-based livelihood strategies. Mobility's distinct transformative potential lies in the establishment of relations of circulation of people and resources among systems and locales. Figure 2.1 provides a simplified view of mono-directional

flows of people, which, in turn, produce bi-directional flows of material and immaterial resources. In reality, each individual movement has specific features (e.g. short or long-term, circular or permanent, from households sending away one or more members) and multiplies or reduces further mobility opportunities. However, the model highlights that movements of all kinds lead to similar risk outcomes at the different levels considered.

All population movements modify the distribution of population and the availability and access to resources and opportunities for different actors. Individual and contextual features that influence the level of freedom of people's mobility choices determine what the concrete risk outcomes of these processes will be. Research has concentrated on four main levels where consequences are likely to be produced: those moving, their household of origin, their system of origin, and their system of destination. Vulnerability and resilience can be useful heuristic tools in interpreting and comparing the complexity of these transformations.

The experience presented in the following sections shows that the outcomes at each level can be positive or negative, and that risk production and reduction can take place simultaneously within and across different levels. DRR requires therefore looking at the full spectrum of mobility patterns, as well as related flows of material and immaterial resources, across locales, to understand what is their overall effect on the production and reduction of risk for those on the move, as well as for host and home communities. Without adopting this comprehensive perspective, DRR actions, and in particular those aiming to manage human mobility in ways that minimize existing and potential vulnerabilities, can lead to redistribution, rather than reduction, of disaster risk.

4 Population Flows and Disaster Risk

4.1 *Moving as a Risk Dynamic for Those Moving*

As people move into a different landscape, they are confronted with different environmental features, including potentially hazardous events and processes. Studies that have looked at the changes in hazard exposure as a consequence of population movements have highlighted that flows often originate from fragile, resource-scarce ecosystems where hazards are frequent. The overall effect of movement is therefore not necessarily an increase in the number of people living in hazardous areas. However, population flows seem to be concentrating people in specific locations, some of which are becoming "hotspots" of disaster risk—in particular, fast-growing urban areas in regions highly exposed to hazards or facing significant impacts from environmental change (de Sherbinin et al. 2012; Runfola et al. 2013).

Sheer exposure to hazards, though, is insufficient to explain risk outcomes. Access to capital and opportunities are modified by mobility, and so are options

and constraints that underpin people's livelihood strategies (and, as a consequence, their vulnerability and resilience). It is not the mere fact of moving that determines these outcomes; rather, it is structural features of the systems from which and to which movement takes place that determine how mobility translates into different opportunities and hazards for different people. People's origin and destination, and the legal, cultural and socio-economic barriers they encounter in moving from one to the other, matter in determining their levels of access to services and resources in receiving communities (de Haas 2008a; IOM 2013).

People generally move for the prospects of a safer, better life, and for most mobile people movement indeed results in overwhelmingly positive outcomes. By drawing on a translocal pool of resources and opportunities, including those built through previous movements, mobile people are often able to enjoy improved access to goods, services, and opportunities compared to other household members staying behind (De Moor 2011; IOM 2013; UNDP 2009). Moving can help them challenge traditional social roles and constraints and have a distinct empowering effect (de Haas 2008b), and has the potential to increase their overall satisfaction and well-being (Bartram 2013).

However, moving almost inevitably implies being disendowed of certain forms of capital (associated with, e.g. loss of local knowledge, social networks, linguistic proficiency) (Manole and Schiff 2004) and encountering a new set of boundaries (stemming, for instance, from restrictive migration regimes, discriminating policies, xenophobic stances), which can limit available well-being options (IOM 2015). As a consequence, those moving are more likely than native-born to experience insufficient access to basic services, reduced assistance by formal and informal systems and networks and lack of personal and financial security (Adams et al. 2010; Duong et al. 2011; IOM 2013; Ku and Jewers 2013; NESSE 2008; UNDP 2009). This includes increased exposure and vulnerability to natural and man-made hazards.

Limited capital endowment and increased barriers can translate in specific vulnerabilities in disaster situations, in particular through reduced awareness and preparedness due to linguistic barriers, limited trust in risk management actors and knowledge of hazard occurrence and of contingency plans and evacuation procedures, or reduced access to emergency and recovery assistance (Bolin and Stanford 1998; Perry and Mushkatel 2008; Phillips 1993; Wang et al. 2011). On the other hand, mobile people's differential capacities and resources might make them more resilient than people from their host communities: non-native groups have occasionally showed better capacities to prepare for, respond to, and recover from, disasters (Clerveaux et al. 2008; Vu et al. 2009).

Mobile people's well-being and vulnerability are rooted in continued exchange of material and immaterial resources with the household and community of origin. People at home can help manage investments, take care of dependents left behind, deal with bureaucracy or send goods and resources that support consumption and increase food security, including during crises (Frayne 2004; Long 2008; Ratha and Sirkeci 2011). Social capital, strengthened and maintained through these mutual transfers, is essential to the well-being of mobile people. However, ties to a distant

household can also represent a source of obligations for distant members, limiting their opportunities and resources and potentially making them more vulnerable (Hammond 2011).

4.2 Moving as a Risk Dynamic for Sending Households

From the point of view of the sending household, mobility is usually a financially and psychologically costly strategy that has the potential for high well-being returns. The sending household has to invest resources to send and (especially at early stages) support one or more members to a distant location. In addition, its members have to bear the impacts linked with the absence of one or more members and with the modification of the household's structure and capacities. At the same time, if the strategy is successful, mobile people can greatly contribute to the well-being of sending households, in particular through transfers of social and financial remittances. Such transfers multiply and diversify assets and resources available to the family members, allowing for more flexibility in livelihood strategies and for improved management of risks and insecurity, and can ultimately result in enhanced resilience (Le De et al. 2013; Stark and Bloom 1985).

Financial remittances are used both to satisfy short-term needs and to support longer-term savings and investments. They are linked with increased level of consumption, lower incidence of poverty and better access to essential services (such as health and education) for the recipients (Ratha 2013; San Vicente Portes 2009; UNDP 2009; Valero-Gil 2008). Households receiving remittances tend to have more resources to invest in productive assets, better housing and means of transportation, and improved access to information and communication networks (de Haas 2006; Mohapatra et al. 2009). All these expenditures can help reduce the recipients' levels of risk, by improving their food security and health conditions, and making them more prepared and less exposed to future hazards.

Spending, both to satisfy immediate needs and to support collective socio-cultural practices, is also instrumental to improving the households' political status within the community (Dalisay 2008; Le De et al. 2014). Inflow of remittances can make households more self-reliant, contributing to empowering its members, which can make them better able to challenge their social status (Cohen 2011).

Resources transferred through remittances can be used to build up savings, which can in turn be used to cope with unexpected events, including natural hazards (Mohapatra et al. 2009; Yang and Choi 2007). Following shocks, remittances represent a flexible tool to smoothen consumptions and support reconstruction and recovery (Attzs 2008; Fagen 2006; Le De et al. 2014).

On the other hand, most households send out healthy, productive individuals (IOM 2013). As breadwinners leave, traditional livelihood patterns can be downsized or disrupted and remittance inflow can change the lifestyle of the individuals left behind in ways that reduce their self-reliance (Edward and Scott 2003; Zachariah and Rajan 2004). As a consequence, households can find

themselves overly dependent on the transfer of resources from distant members—and thereby threatened by the hazards the latter are exposed to.

In addition, the individuals' psychological well-being and personal security can be negatively affected in households split as a consequence of mobility, and many of those staying behind may end up exposed to increased social risks (e.g. marginalization and violence) (Asis 2008; Dreby 2010; d'Emilio et al. 2007). However, reconfiguration of family patterns can also have beneficial effects: social networks can be enlarged (Asis 2008) and gender roles challenged, in particular as female stayers take a more prominent role in household decision-making and economic management (Deshingkar and Grimm 2005; King and Vullnetari 2006).

4.3 Mobility as a Risk Dynamic for the Home System

Impacts of population and resource flows on the system of origin are complex and affect the whole set of its intertwined human and natural components. Environmental impacts can consist of both intensification and disintensification of land use practices, and improve, reduce, or leave unchanged the levels of ecosystem health and hazard occurrence.

Reduction of population pressures can lead to the abandonment of intensive land-use practices, with positive impacts on slope stability, erosion, water availability, and sedimentation levels (Deshingkar 2012; Jokisch 2002; Schwilch et al. Chap. 11). However, reduction of available human capital can reduce the communities' capacity to maintain infrastructures (e.g. terraces, water catchment, and irrigation systems) that are essential for the functioning of traditional cultural landscapes. This can result in biodiversity loss, increased incidence of landslides, floods, fires, avalanches, soil erosion, and desertification, and ultimately reduced food, water, and livelihood security (Raj Khanal and Watanabe 2006; Rey Benayas et al. 2007).

As additional resources flow into remittance-receiving households, communities can engage in environmentally unsustainable behaviors (Gray 2009; Robson and Nayak 2010). Increased use of land stemming from development of residential housing can lead to environmental degradation and increased hazard incidence (Klaufus 2010). Resources can also be invested in conservation activities (Konseiga 2004) and intensification of agricultural practices can lead to the concentration of environmental pressures to limited areas, allowing for ecosystem recovery in areas left uncultivated (Deshingkar 2012; Vanwey et al. 2012).

Population and resource flows are also key to the perpetuation and evolution of cultural, social, and political traits of communities and societies (Asis 2008; Le De et al. 2014). People's movement can underpin exchange of knowledge and ideas, increasing available human capital and circulating technologies and skills that support hazard prevention and mitigation, sustainable resource use, improved health or livelihood strengthening and diversification (de Haas 2006; Rinke 2012; UNDP 2009). These dynamics can also help challenge class and ethnic roles,

helping subaltern groups escape from traditional social constraints (Cohen 2011; de Haas 2008a, b).

The inflow and spending of remittances can support the whole economic system, while population movements can stimulate or strengthen commercial relations between home and host communities (Lucas 2005). Consequent expansion of investment and local markets has the potential to reduce overall poverty levels, including for households not receiving remittances (Cohen 2011; Jongwanich 2007).

Direct engagement of diaspora members can effectively reduce vulnerability in home communities: water management, health and education, food security, resource conservation, and post-disaster recovery have been financed through collective support mechanisms or otherwise supported by migrants and returnees (Le De et al. 2014; Orozco 2007; Scheffran et al. 2012). Public and private institutions in home countries have leveraged diasporas' investments and savings to promote economic and social development, including risk reduction (Akkoyunlu and Stern 2012; Orozco 2008). Diaspora groups in receiving countries have been involved in designing and implementing development activities in areas of origin, with the added benefit of achieving better inclusion of newcomers in host communities (Østergaard-Nielsen 2011; Sall 2005).

These transfers of resources, though, have limited potential to support system-wide development and to tackle the fundamental economic processes that produce poverty and vulnerability (de Haas 2008a, b). Remittances do not necessarily reduce income inequalities in the community of origin. In fact, they can entrench them by concentrating resources in the hands of more affluent households or leading to currency devaluation and inflation, to the detriment of non-receiving households (Mazzuccato 2008; Ratha 2013). This can result in increased marginalization of non-receiving households, and ultimately in conditions of vulnerability to future hazards (Deshingkar and Aheeyar 2006). Unbalances embedded in the sender/receiver relationship can also reproduce existing social inequalities, including those linked with gender and age (Kunz 2011).

Demographic changes induced by mobility flows, in particular through the disproportionate loss of healthy, skilled, productive individuals, can cause significant socio-economic disruption of home communities and societies. Increased dependency rates, as the proportion of old and infirm people augments, can reduce the effectiveness of public welfare systems and kin and community-level caregiving (Bernhard et al. 2009; King and Vullnetari 2006). This also has implications on the effectiveness of hazard preparedness and disaster assistance. Loss of workforce can also lead to systemic fiscal and economic consequences, and can affect availability and quality of essential services, such as health and education, as well as of hazard-resistant housing for those staying behind (Docquier et al. 2010; Tasan-Kok and Stead 2013).

4.4 Mobility as a Risk Dynamic for the Host System

Population inflows also affect the economic and social life of communities of transit and destination: mobile people increase available labor supply, stimulate local economy, and contribute to maintaining functioning fiscal and social insurance systems as well as care-giving arrangements—an effect that is especially important for countering increasing dependency rates in ageing societies (Carter 2008; Ortega and Peri 2009). Mobile people can integrate the receiving countries' skill gaps (Farrant et al. 2006; Manole and Schiff 2004), which can be especially important in the aftermath of disasters and crises, when incoming workers support relief, reconstruction, and recovery efforts (Hugo 2008). Their presence is also positively related to the receiving societies' capacity for political, technological, and cultural innovation (Ratha et al. 2010).

At the same time, demographic increase translates into additional pressures on the system of destination, as well as on all areas that supply its community with resources and services. These pressures can result in reduced access to essential services and opportunities if local markets and institutions are unable to absorb increasing demand. Sudden, massive movements (including those linked with disasters and man-made crises) are particularly challenging.

Unsustainable use of ecosystems can lead to environmental degradation, increasing hazard occurrence and affecting mobile people's and host population's food and water security (McGranahan and Tacoli 2006; UNEP 2011). Unmanaged pressures on labor and housing markets, health and education systems as well as water supply, sanitation and waste management infrastructures, can negatively affect people's safety and well-being. Increased competition for scarce resources is likely to disproportionately affect weaker individuals, most often women, youth and elderly, and unskilled workers (UNDP 2009). Unmanaged population inflows also have the potential to reduce the community's collaboration and cohesion (Freire and Xiaoye 2013) and fuel inter-communal tensions and conflicts, in particular in periods of hardship such as disasters, economic downturn, and humanitarian crises.

5 Conclusions and Recommendations

The concrete outcomes of human mobility largely depend on the features of contexts of origin and of destination, including distribution of hazards and opportunities and prevailing patterns of (and barriers to) access to resources and services, as well as on the socio-economic situation of migrants and their households. Mobility, however, transforms all these features across sites and scales. It is hence both a product and a determinant of the socio-natural context people live in, integral to human development processes that shape hazard exposure, vulnerability, and resilience. Mobility poses specific challenges and offers specific

opportunities to risk reduction and should be integrated in the holistic perspective that characterizes DRR.

The risk outcomes from moving are profoundly heterogeneous for different mobile and non-mobile people in communities of origin and of destination. Positive and negative changes are inextricably intertwined: all, however, matter for risk reduction and cannot be understood in isolation. It is therefore necessary to look at the whole range of individual, household, community and system-level features, in contexts of origin and of destination that are modified by human and resource flows induced by mobility decisions, and understand how change reflects onto people's risk levels. Thinking in terms of risk and risk reduction allows to interpret this multi-sited complexity in a coherent (and potentially comparable) way: this might be the inherent value of mobility-cum-DRR research.

Human mobility is a dynamic that influences individual and collective vulnerability and capacities. As such, it should be a key concern for risk management, as well as for all policies and actions that can produce or reduce risk. Land use planning, urban and economic development, delivery of basic services and ecosystem management affect mobility decisions of more or less distant individuals: reducing risks through such activities requires factoring in their mobility consequences, as well as people's movements' impacts on risk. This requires adding one more dynamic perspective to DRR, which overcomes sites, actors and time boundaries.

On the other hand, exploring human mobility from a DRR angle shows that policies and measures that facilitate, impede, regulate or manage population movements produce different risk outcomes for different people. Such policies and measures translate into increased or reduced needs and access to capital and opportunities (and ultimately in reduced or increased risk conditions) for those moving, as well as for those living in home and host communities.

It is important to highlight that all forms of mobility (not only disaster-related or induced) matter to risk reduction: whether planned or unplanned, forced or voluntary, population movements transform the risk landscape of different individuals and communities, influencing the way they are impacted by hazards. Stakeholders, procedures, and responsibilities might differ depending on the kind of movement that concretely needs to be managed. However, preserving and improving access to assets and opportunities for those moving, while preventing negative outcomes and producing positive ones for home and host households, communities and systems, are equally the objectives of efforts to manage migration, evacuations and displacement, and planned relocations and resettlements.

These considerations raise a number of theoretical questions:

- What is the overall impact of mobility in terms of risk reduction and risk creation? How can costs and benefits be measured and compared?
- Does human mobility challenge or reproduce existing conditions of vulnerability? Is mobility a viable risk reduction strategy for the most vulnerable?

- Under what conditions is mobility's risk reduction potential best harnessed? What should be avoided in order to reduce its potential negative impacts?

In order to answer this question, in turn, it seems necessary to:

- Adopt a translocal, multi-scale and diachronic perspective to the analysis of risk reduction and risk creation, which accounts for population movements and their in situ and distant outcomes;
- Take into account all population movements in risk reduction research—without limiting the object of study to environmentally induced or cross-border movements;
- Analyze mobility decisions under the lens of livelihood practices, and understand mobility and immobility (including in the face of shocks and stresses) in a continuum of interlinked choices that depend on people's needs and capacities, each with its own effect on well-being and vulnerability;
- Systematically disaggregate risk and disaster data by individual and household mobility patterns and status.

This understanding should help implement and evaluate risk reduction options, including those that have been highlighted in the SFDRR: the involvement of migrants in DRR efforts (both in areas of origin and of destination) and the management of environmentally induced mobility (including migration, displacement, and relocations) in ways that do not increase risk and strengthen resilience. Going beyond the SFDRR text, however, preventing and reducing risk might also require looking at the following:

- Considering the mobility consequences of policies and investments (including to manage or regulate migration, and support development and risk reduction), in order to anticipate and manage their negative impacts on risk creation;
- Making safe forms of movement more accessible and affordable;
- Improving vulnerable mobile people's access to adequate resources and opportunities in areas of transit and destination;
- Supporting host communities and institutions, and in particular their most marginalized groups, in order to reduce negative impacts of population pressures;
- Facilitating the transfer of resources stemming from movements and promoting their use in ways that reduce vulnerabilities for the broader recipient community; and
- Providing effective alternatives to mobility, when they might be needed.

Human mobility cannot be considered in isolation from existing socio-environmental structures and relations that produce vulnerability. In turn, it shapes the highly contextual and complex local conditions in which risk is created, manifested, and reduced. In an increasingly mobile world, seizing the opportunities and addressing the challenges associated with human mobility will be essential for reducing the impacts of natural hazards, as well as for promoting sustainable development.

References

- Adams V, van Hattum T, English D (2010) Chronic disaster syndrome: displacement, disaster capitalism, and the eviction of the poor from New Orleans. *Am Ethnol* 36(4):615–636
- Akkoyunlu S, Stern M (2012) An empirical analysis of diaspora bonds. Research paper 2012/3. Graduate Institute, Geneva
- Asis MMB (2008) How international migration can support development: a challenge for the Philippines. In: Castles S, Delgado-Wise R (eds) *Migration and development: perspectives from the South*. International Organization for Migration, Geneva, p 175
- Attzs M (2008) Natural disasters and remittances: exploring linkages between poverty, gender and disaster vulnerability in Caribbean SIDS. Research Paper 2008/61. United Nations University, Bonn
- Bartram D (2013) Happiness and ‘economic migration’: a comparison of Eastern European migrants and stayers. *Migrat Stud* 1(2):156–175
- Bernhard JK, Landolt P, Goldring L (2009) Transnationalizing families: Canadian immigration policy and the spatial fragmentation of care-giving among Latin American newcomers. *Int Migr* 47(2):3–31
- Black R, Adger WN, Arnell NW et al (2011) The effect of environmental change on human migration. *Global Environ Chang* 21(S1):S3–S11
- Black R, Arnell NW, Adger WN et al (2012) Migration, immobility and displacement outcomes following extreme events. *Environ Sci Pol* 27(S1):S32–S43
- Bolin R, Stanford L (1998) The Northridge earthquake: community-based approaches to unmet recovery needs. *Disasters* 22(1):21–38
- Brickell K, Datta A (2011) *Translocal geographies: spaces, places, connections*. Ashgate, Burlington
- Carter SB (2008) Labor market flooding? Migrant destination and wage change during America’s age of mass migration. In: DeWind J, Holdaway J (eds) *Migration and development across borders: research and policy perspectives on internal and international migration*. International Organization for Migration and Social Science Research Council, Geneva
- Castles S (2002) Environmental change and forced migration: making sense of the debate. Working paper 70. Refugee Studies Centre, Oxford
- Castles S (2010) Understanding global migration: a social transformation perspective. *J Ethn Migr Stud* 36(10):1565–1586
- Castles S, Miller MJ (2009) *The age of migration: international population movements in the modern world*, 4th edn. Palgrave MacMillan, Basingstoke
- Chambers R, Conway G (1992) Sustainable rural livelihoods: practical concepts for the 21st century. IDS Discussion Paper 296. Institute for Development Studies, Brighton
- Clerveaux V, Spence B, Katada T (2008) Using game techniques as a strategy in promoting disaster awareness in Caribbean multicultural societies: the disaster awareness game. *J Disaster Res* 3(5):1–13
- Cohen JH (2011) Migration, remittances, and household strategies. *Annu Rev Anthropol* 40:103–114
- d’Emilio AL, Cordero B, Bainvel B et al (2007) The impact of international migration: children left behind in selected countries of Latin America and the Caribbean. United Nations Children’s Fund, New York
- Dalisay SNM (2008) Survival strategies to overcome inagosto and nordeste in two coastal communities in Batangas and Mindoro, the Philippines. *Disaster Prev Manage* 17(3):373–382
- de Haas H (2006) Migration, remittances and regional development in Southern Morocco. *Geoforum* 37:565–580
- de Haas H (2008a) Migration and development: a theoretical perspective. International Migration Institute, Oxford

- de Haas H (2008b) North African migration systems: evolution, transformations, and development linkages. In: Castles S, Delgado-Wise R (eds) *Migration and development: perspectives from the South*. International Organization for Migration, Geneva, p 143
- De Moor N (2011) Labour migration for vulnerable communities: a strategy to adapt to a changing environment. COMCAD Working Paper 101
- de Sherbinin A, Levy M, Adamo S et al (2012) Migration and risk: net migration in marginal ecosystems and hazardous areas. *Environ Res Lett* 7:1–13
- Deshingkar P (2012) Environmental risk, resilience and migration: implications for natural resource management and agriculture. *Environ Res Lett* 7:015603
- Deshingkar P, Aheeyar MMM (2006) *Remittances in crises: Sri Lanka after the tsunami*. Overseas Development Institute, London
- Deshingkar P, Grimm S (2005) *International migration and development: a global perspective*, vol 19, Migration research series. International Organization for Migration, Geneva
- Docquier F, Marchiori L, Shen IL (2010) Brain drain in globalization: a general equilibrium analysis of the sending countries' perspective. Discussion Paper 7682. CEPR
- Dreby J (2010) *Divided by borders: Mexican migrants and their children*. University of California Press, Berkeley
- Duong LB, Linh TG, Thao NTP (2011) Social protection for rural-urban migrants in Vietnam: current situation, challenges and opportunities. Institute of Development Studies, Hanoi
- Edward TJ, Scott R (2003) Migration and incomes in source communities: a new economics of migration perspective from China. *Econ Dev Cult Change* 52:75–101
- Fagen P (2006) *Remittances in crises: a Haiti case study*. Overseas Development Institute, London
- Farrant M, MacDonald A, Sriskandarajah D (2006) *Migration and development: opportunities and challenges for policymakers*, vol 22, Migration research series. International Organization for Migration, Geneva
- Felli R, Castree N (2012) Neoliberalising adaptation to environmental change: foresight or foreclosure? *Environ Plan A* 44(1):1–4
- Findley SE (1994) Does drought increase migration? A study of migration from rural Mali during the 1983–1985 drought. *Int Migr Rev* 28:539–553
- Foresight Migration and Global Environmental Change (2011) Final project report. The Government Office for Science, London
- Frayne B (2004) Migration and urban survival strategies in Windhoek, Namibia. *Geoforum* 35(4):489–505
- Freire T, Xiaoye L (2013) How immigration reduced social capital in the US: 2005–2011. Social Science Research Network working paper. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2222650
- Fussel E, Sastry N, Van Landingham M (2010) Race, socioeconomic status, and return migration to New Orleans after Hurricane Katrina. *Popul Environ* 31:20–42
- Gray CL (2009) Rural out-migration and smallholder agriculture in the Southern Ecuadorian Andes. *Popul Environ* 30:193–217
- Greiner C, Sakdapolrak P (2012) Rural-urban migration, agrarian change and the environment in Kenya. A critical review of the literature. *Popul Environ*. doi:10.1007/s11111-012-0178-0
- Hammond L (2011) Obligated to give: remittances and the maintenance of transnational networks between Somalis at home and abroad. *Bildhaan* 10, article 11
- Hugo G (2008) *Migration, development and environment*, vol 35, Migration research series. International Organization for Migration, Geneva
- IOM (2013) *World migration report 2013: migrant well-being and development*. International Organization for Migration, Geneva
- IOM (2015) *World migration report 2015: migrants in cities*. International Organization for Migration, Geneva
- Jokisch BD (2002) Migration and agricultural change: the case of smallholder agriculture in highland Ecuador. *Hum Ecol* 30(4):523–550

- Jongwanich J (2007) Workers' remittances, economic growth and poverty in developing Asia and the Pacific Countries. Working Paper 1997/1. United Nations Economic and Social Commission for Asia and the Pacific
- King R, Vullnetari J (2006) Orphan pensioners and migrating grandparents: the impact of mass migration on older people in rural Albania. *Ageing Soc* 26(5):783–816
- Klaufus C (2010) Watching the city grow: remittances and sprawl in intermediate Central American cities. *Environ Urban* 22(1):125–137
- Kniveton D, Schmidt-Verkerk K, Smith C, Black R (2008) Climate change and migration: improving methodologies to estimate flows. International Organization for Migration, Geneva
- Konseiga A (2004) Adoption of agricultural innovations in the Sahel: the role of migration in food security. Paper presented at the 2004 food and nutrition security policies regional workshop in Mali
- Ku L, Jewers M (2013) Health care for immigrants: current policies and issues. Migration Policy Institute, Washington
- Kunz R (2011) The political economy of global remittances: gender, governmentality and neo-liberalism. Routledge, London
- Le De L, Gaillard JC, Friesen W (2013) Remittances and disaster: a review. *Int J Disaster Risk Reduct* 4:34–43
- Le De L, Gaillard JC, Friesen W, Matautia Smith F (2014) Remittances in the face of disasters: a case study of rural Samoa. *Environ Dev Sustain*. doi:10.1007/s10668-014-9559-0
- Long N (2008) Translocal livelihoods, networks of family and community and remittances in Central Peru. In: DeWind J, Holdaway J (eds) Migration and development across borders: research and policy perspectives on internal and international migration. International Organization for Migration and Social Science Research Council, Geneva
- Lucas R (2005) International migration regimes and economic development. Report for the Expert Group on Development Issues in the Swedish Ministry for Foreign Affairs. <http://www.egdi.gov.se/migraion.htm>
- Manole V, Schiff M (2004) Migration and diversity: human versus social capital. IZA Discussion Paper 1279. Institute for the Study of Labor, Bonn
- Mazzuccato V (2008) Simultaneity and network in transnational migration: lessons learned from a simultaneous matched-sample methodology. In: DeWind J, Holdaway J (eds) Migration and development across borders: research and policy perspectives on internal and international migration. International Organization for Migration and Social Science Research Council, Geneva
- McDowell C, de Haan A (1997) Migration and sustainable livelihoods: a critical review of the literature. IDS working paper 65. Institute of Development Studies, Brighton
- McGranahan G, Tacoli C (2006) Rural-urban migration in China: policy options for economic growth, environmental sustainability and equity. International Institute for Environment and Development, London
- McLeman RA (2006) Migration out of 1930s rural Eastern Oklahoma: insights for climate change research. *Great Plains Quarterly Paper* 151
- McLeman RA (2014) Climate and human migration. Cambridge University Press, New York
- Mohapatra S, Joseph G, Ratha D (2009) Remittances and natural disasters: ex-post response and contribution to ex-ante preparedness. The World Bank, Washington
- NESSE (2008) Education and the integration of migrant children. European Commission, Bruxelles
- Orozco M (2007) Central American diasporas and hometown associations. Inter American Development Bank, Washington, DC
- Orozco M (2008) Diasporas and development: issues and impediments. In: Brinkerhoff JM (ed) Diasporas and international development: exploring the potential. Lynne Rienner, Boulder
- Ortega F, Peri G (2009) The causes and effects of international labour mobility: evidence from OECD countries 1980–2005. United Nations, New York

- Østergaard-Nielsen E (2011) Codevelopment and citizenship: the nexus between policies on local migrant incorporation and migrant transnational practices in Spain. *Ethnic Racial Stud* 34 (1):20–39
- Perry RW, Mushkatel AH (2008) *Minority citizens in disasters*. University of Georgia Press, Athens
- Phillips BD (1993) Cultural diversity in disasters: sheltering, housing and long-term recovery. *Int J Mass Emerg Disasters* 11(1):99–110
- Piguot E (2010) Climate and migration: a synthesis. In: Afifi T, Jäger J (eds) *Environment, forced migration and social vulnerability*. Springer, Berlin, p 73
- Raj Khanal N, Watanabe T (2006) Abandonment of agricultural land and its consequences. *Mount Res Dev* 26:32–40
- Ratha D (2013) The impact of remittances on economic growth and poverty reduction. Migration Policy Institute, Washington
- Ratha D, Sirkeci I (2011) Remittances and the global financial crisis. *Migrat Lett* 7(2):125–131
- Ratha D, Mohapatra S, Scheja E (2010) Impact of migration on economic and social development: a review of evidence and emerging issues. Background paper to the Global Forum on Migration and Development
- Rey Benayas JM, Martins A, Nicolau JM, Schulz JJ (2007) Abandonment of agricultural land: an overview of drivers and consequences. *CAB Rev* 57
- Rinke T (2012) Temporary and circular labor migration between Spain and Colombia. In: Gemenne F, Bruecker P, Ionesco D (eds) *State of environmental migration 2011*. Institute for Sustainable Development and International Relations and International Organization for Migration, Paris
- Robson JP, Nayak PK (2010) Rural out-migration and resource-dependent communities in Mexico and India. *Popul Environ* 32:263–284
- Runfola DM, Romero-Lankao P, Jiang L et al (2013) The influence of internal migration on exposure to extreme weather events in Mexico. Working paper 4, population programme. Institute of Behavioral Science, Boulder
- Sakdapolrak P, Promburom P, Reif A (2014) Why successful in situ adaptation with environmental stress does not prevent people from migrating? Empirical evidence from Northern Thailand. *Clim Dev* 6(1):38–45
- Sall B (2005) Remittances and economic initiatives in sub-Saharan Africa. In: *Migration, remittances and development*. OECD, Paris, p 265
- San Vicente Portes L (2009) Remittances, poverty and inequality. *J Econ Dev* 34(1):127–140
- Sanderson MR (2009) Globalization and the environment: implications for human migration. *Hum Ecol Rev* 16:93–102
- Scheffran J, Marmer E, Sow P (2012) Migration as a contribution to resilience and innovation in climate adaptation: social networks and co-development in Northwest Africa. *Appl Geogr* 33:119–127
- Schensul D, Dodman D (2013) Populating adaptation: incorporating population dynamics in climate change adaptation policy and practice. In: Martine G, Schensul D (eds) *The demography of adaptation to climate change*. United Nations International Institute for Environment and Development and El Colegio de México, New York, p 1
- Sen A (2000) *Development as freedom*. Oxford University Press, New York
- Skeldon R (2008) Linkages between internal and international migration. In: DeWind J, Holdaway J (eds) *Migration and development across borders: research and policy perspectives on internal and international migration*. International Organization for Migration and Social Science Research Council, Geneva
- Stark O (1991) *The migration of labour*. Blackwell, Oxford
- Stark O, Bloom DE (1985) The new economics of labour migration. *Am Econ Rev* 75(2):173–178
- Tacoli C (2009) Crisis or adaptation? Migration and climate change in a context of high mobility. *Environ Urban* 21(2):513–525
- Tacoli C (2013) Migration as a response to local and global transformations: a typology of mobility in the context of climate change. In: Martine G, Schensul D (eds) *The demography*

- of adaptation to climate change. United Nations International Institute for Environment and Development and El Colegio de México, New York, p 41
- Tasan-Kok T, Stead D (2013) Analysing the socio-spatial vulnerability to drivers of globalisation in Lisbon, Oporto, Istanbul, Stockholm and Rotterdam. In: Eraydin A, Tasan-Kok T (eds) Resilience thinking in urban planning. Springer, Berlin, p 71
- UNDESA (2013) International migration report 2013. United Nations, New York
- UNDP (2009) Human development report 2009: overcoming barriers, human mobility and development. United Nations, New York
- UNEP (2011) Livelihood security: climate change, migration and conflict in the Sahel. United Nations Environment Programme, Geneva
- Valero-Gil J (2008) Remittances and the household's expenditure on health. MPRA Working Paper 9572. University Library, Munich
- Vanwey LK, Guedes GR, D'Antona AO (2012) Out-migration and land-use change in agricultural frontiers: insights from the Altamira settlement project. *Popul Environ* 34(1):44–68
- Vu L, VanLandingham MJ, Do M, Bankston CL (2009) Evacuation and return of Vietnamese New Orleanians affected by Hurricane Katrina. *Organ Environ* 22(4):470–478
- Wang MZ, Amati M, Thomalla F (2011) Understanding the vulnerability of migrants in Shanghai to typhoons. *Nat Hazards*. doi:[10.1007/s11069-011-9902-9](https://doi.org/10.1007/s11069-011-9902-9)
- Wisner B, Blaikie P, Cannon T, Davis I (2004) *At risk: natural hazards, people's vulnerability and disasters*, 2nd edn. Routledge, London
- Wisner B, Gaillard JC, Kelman I (2012) Framing disaster: theories and stories seeking to understand hazards, vulnerability and risk. In: Wisner B, Gaillard JC, Kelman I (eds) *The Routledge handbook of hazards and disaster risk reduction*. Routledge, London
- Yang D, Choi H (2007) Are remittances insurance? Evidence from rainfall shocks in the Philippines. *World Bank Econ Rev* 21(2):219–248
- Zetter R, Morrissey J (2014) The environment-mobility nexus. In: Fiddian-Qasmiyeh E, Loescher G, Long K, Sigona N (eds) *The Oxford handbook of refugee and forced migration studies*. Refugee Studies Centre, Oxford
- Zachariah KC, Rajan SI (2004) Gulf revisited Working Paper 363. Centre for Development Studies, Thiruvananthapuram

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