



People in motion, forests in transition

Trends in migration, urbanization, and remittances and their effects on tropical forests

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Aerial view of Manaus, the capital of the Brazilian state of Amazonas.

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Executive summary

Migration is not new. In recent decades, however, human mobility has increased in numbers and scope and has helped fuel a global shift in the human population from predominantly rural to urban. Migration overall is a livelihood, investment and resilience strategy. It is affected by changes across multiple sectors and at varying scales and is affected by macro policies, transnational networks, regional conditions, local demands, political and social relations, household options and individual desires. Such enhanced mobility, changes in populations and communities in both sending and receiving areas, and the remittances that mobility generates, are key elements of current transitions that have both direct and indirect consequences for forests. Because migration processes engage with rural populations and spaces in the tropics, they inevitably affect forest resources through changes in use and management. Yet links between forests and migration have been overlooked too often in the literature on migration, as well as in discussions about forest-based livelihoods.

With a focus on landscapes that include tropical forests, this paper explores trends and diversities in the ways in which migration, urbanization and personal remittances affect rural livelihoods and forests. Assuming that our readership tends to have broader knowledge of issues in tropical forestry than of demographic change, we review some basic demographic terms and the broad outlines of contemporary migration flows and drivers.

A major issue arises in the varied definitions of migrants and migration. Much of the literature focused on forests overlooks the intricacies and differences between types of migrants, the bases of their decisions to migrate and to invest their salaries, and the spatial, temporal, economic and social complexities of their movements. Movements may be officially sanctioned and documented or clandestine, permanent or circular,

internal or external, rural to rural, rural to urban or urban to rural; each may have multiple impacts on livelihoods. Migrations differ by scale and timing. Migrants and migratory processes also differ by class, gender, culture, resources, occupations and destinations, as do the networks and institutions that mediate migration. The multiple pathways, flows and intensities of migration lead to a great variety of economic and environmental outcomes. Globally, both generational and gender migration trends affect forest and livelihoods. Most international migrants are believed to be of working age; migrants aged between 30–39 years were the largest group in both developed and developing countries.

The gendered nature of migration is important in considering impacts, and it has been changing. Which family members migrate, which do not, as well as the timing, the goals and results of migration, are conditioned by a range of macro push and pull factors mediated by micro trends, contexts and structures that combine to inhibit or facilitate individuals' or households' decisions to move or stay. Understanding these variations and building that understanding into further research that seeks to link changes in forest cover to migration and vice versa may help shed light on what appear to be contradictory findings.

Much data on migration and remittances have major limitations and important gaps; government institutions in particular have not systematically integrated migration and its nuances into their research frames for collecting agricultural, economic and population data. Relevant datasets are often narrow and difficult to compare. Numbers on formal (legal) and international migration and financial transfers are notably better than those that measure internal movements, illegal migration and personal transfers of funds. Even the existing information on international

remittances and migrant populations varies across countries. Many migrants and transactions remain uncoun- ted and unknown to data collection agencies. For internal migrants, data accounting for mobility rarely exist and data on internal remittance flows are limited to informal accountings and estimates by case study researchers. Available data are difficult to compare because of differences in the types of data, the intervals in which migration is measured and the statistical geographies in which they are. Data and information on social remittances and in-kind remittances exist only in case studies. These limitations hamper research on the nexus between migration and forests.

Rural livelihoods, whether in forested or non-forested landscapes, are now commonly formed from multiple localities within and beyond the rural, encompassing peri-urban, urban and transnational incomes and resources, and recent literature on migration demonstrates that the distinctions between rural and urban spaces are becoming increasingly blurred. Migration and mobility bring the urban to the rural and vice versa through exchanges of finances, goods, ideas and practices. Furthermore, with increasing recognition of 'stretched', multi-local or translocal households, all of which are dynamic, constantly changing categories, questions arise about how to define 'households' when members are distributed across multiple locations.

Much existing literature remains premised on simplistic and dichotomous assumptions. Many observers argue that tropical deforestation is an outcome of migration into forests or that forest recovery is a consequence of migration and/or alternative land-use investments. Each of these potential impacts on forests has been shown to occur, but the many mediating factors that influence these outcomes are still little researched and narrowly understood. Under some conditions, migration threatens forests while others enable them to thrive.

While the above challenges remain and we still have little empirical data for understanding how and when different trajectories are taken, there are a few insights that emerge from this preliminary review. These insights include:

- While migration has long been a feature of communities living near and using tropical forests, contemporary patterns differ in size and scope, making migration central to understanding the past, present, and future of forests and forest-based communities.
- Given the prevalence of circular patterns of mobility and multi-locality, the movement of individuals away from forest areas rarely, if ever, leaves rural places empty or devoid of economic activity.
- Emigration does not necessarily lead to forest resurgence, in some instances lower population densities in forest areas lead to increased deforestation because of lower protections and new uses of the forest that ensue.
- Changing (and or varied) patterns of gender and age (across history and cases) among both migrant populations and those remaining in rural areas are essential to understanding the effects of migration on forests.
- Massive population flows between rural and urban areas are not only altering forest use and resource consumption through the 'urbanization' of rural areas and populations, but also the 'ruralization' of urban places and populations.
- Research shows that remittances have impacts on forest cover, on biodiversity and other forest characteristics, and on the use of forest products. These effects, however, have been shown to highly variable. Again, context matters.

It is clear that current data gathering, including national demographic and economic censuses, rarely capture the importance of forests or migration to rural or household livelihoods. Many challenges continue to exist, among them:

- Migration as an adaptive strategy and forests as buffers, as well as the roles of forests in the livelihood strategies of both migrants and the households remaining, are understudied.
- We need to understand the implications of migrants' remittances for forests and peoples' livelihoods, whether these be internal or international, or monetary, in kind or intangible. The potential roles of skills and other social remittances that migrant returnees bring back in transforming forested landscapes also merit further consideration.

- Relevant demographic and social dynamics need to be unraveled; how differing gender, class, ethnicity and other dimensions of social differentiation influence forest uses, dependency, and rules and norms over access to and control of forests in a situation of accelerated migration.
- Migration issues need attention but should also be studied in light of other important trends and transitions related to rural landscapes and forests, such as the declining number

and role of small farmers as food producers, the instabilities of commodity markets, the decline in 'open' land frontiers, the increasing importance of off-farm and wage labor for rural household incomes; the corresponding effects of feminization (and in some instances masculinization) and geriatrification of rural populations and landscapes; and the effects of escalating violence and instability in many tropical developing countries on migration and forest use.

1 Introduction: People in motion, forests in transition

Migration has deep roots in resource management strategies. Historically, people have been mobile in their pursuit of food, water, land and income. People have also migrated to gain knowledge, to escape calamities, to win riches and to trade. Many have been pushed to move by political changes, economic shifts, violence and war. Population movements are not new. What is different in the conjuncture today is the hyper-globalized context of human mobility, the long distances and the sheer numbers. Recent estimates have almost a billion people engaged in both internal and external migration (UNDP 2009).

Mobility provides a way to “seek opportunities to improve living standards, health and education outcomes, and/or to live in safer, more responsive communities” (UNDP 2010, 1). In developing countries, the incentive to migrate in search of economic opportunities is amplified by widening gaps in services, investment and in employment opportunities between rural and urban regions, more and less developed areas within countries, and between developing and developed countries (Tiwari and Bhattarai 2011), although, as we discuss further on, migration has many other drivers. Moreover, advances in mobility through better transport have improved accessibility and lowered costs of migration significantly. Communication technology has played a role in enhancing information flows. The emergence of formal and informal migrant-oriented institutions and networks has further facilitated migration. The increasing numbers of labor migrants have in turn augmented the value of remittances that are sent back to their households (Tiwari and Bhattarai 2011).

Enhanced mobility, changes in populations and communities in both sending and receiving areas, and the remittances that mobility generates, are key elements of current transitions especially in

the developing world. These trends linked with increasing populations and urban expansion have both direct and indirect consequences for forests. Yet, discussion of the effects of changing migration patterns and processes on forests and rural landscapes are largely missing from the literature on migration and remittances. The relative paucity of data and limited analysis of the connections between migration, urbanization and forests, may reflect a general ‘invisibility’ of forests as parts of rural, as well as urban, livelihoods and incomes despite the fact that they have long been sources of commodities, subsistence, meaning and social refuge (Hecht et al. 2012, 2014; Wunder, et al. 2014a, b).

With a focus on landscapes that include tropical forests, this paper explores trends and diversities in the ways in which migration, urbanization and personal remittances affect rural livelihoods and forests. The paper consists of three parts. It begins by briefly outlining a number of ways in which forest landscapes and rural communities are changing, above all in the tropical world. The next section presents some salient migration trends, including external (international) and internal (within country) migration, the growth of remittances, as well as other rural–urban transformations. This section introduces the need to differentiate migration forms and processes, and outlines their associated data limitations. Assuming that our readership tends to have broader knowledge of issues in tropical forestry than of demographic change, we review some basic demographic terms and the broad outlines of contemporary migration flows and drivers.

The third section reviews existing literature on migration and forests and attempts to disentangle that relationship, both in terms of drivers of change and of changes in livelihoods and forests. Overall, the paper aims to connect migration to forests and

the households and communities that are part of these processes. Ultimately, we hope to explain the impacts of migration and urbanization on forest transformations. A comprehensive survey of research on either migration or forests is beyond the scope of this paper. Rather, it aims to provide a flavor of what exists, evaluate

some underlying limitations and prospects of existing work in this area, and identify issues for future research on migration and forests. Finally, the paper's conclusions point out existing gaps in knowledge and identify some future research directions on forests, urbanization and migration.

2 Trends and transitions

2.1 Rethinking rural

Rural livelihoods in the global South – an area that includes large areas of tropical forests – are becoming increasingly diversified and less reliant on agriculture and rural biomass extraction. Sources of rural household incomes commonly include waged labor and extraction from multiple localities, often lying beyond rural boundaries. In light of a growing number of studies that are documenting changes in the nature, scale, function and practices of what is conventionally understood as being ‘rural’, the term ‘rural’ itself has come under increasing scrutiny. Rigg et al. (2012) among others have suggested that much of what is assumed about rural areas may not reflect current realities. Myths of ‘sedentary peasantries’ and ‘stable communities’ need to be reconsidered. The majority of forest-based research reflects the assumption that Rigg criticizes, namely that rural households and communities are largely static and spatially bounded, an assumption that ignores past and present-day migration flows of people and remittances (Rigg et al. 2012). Analysts further argue that the term ‘rural’ itself is problematic because there are gradations of rural, dependent critically on access to basic services such as health, infrastructure and education (Parry et al. 2010).

Issues of migration and mobility also lie outside the attention of most natural resource governance policy makers. Forest governance (whether by states or ‘communities’) involves practices of territorialization that necessarily involve ‘fixing’ people in places. Where environmental policy domains do acknowledge migration, it is often seen as disruptive (migrants are a problem) or a sign of livelihood failure (we need better policies so people won’t need to move). As an illustration, Sijapati Basnett (2013) finds in her review of forestry policies and forestry scholarship in Nepal that questions of how seasonal and transnational migrations are affecting the governance of forests

remains unacknowledged and unaddressed. National policies continue to be underpinned by the notion that rural households are physically and socially bounded and connected to specific forests. This is in spite of the fact that migration has historically been an important part of rural livelihoods in Nepal. Globalization and market expansion have spurred increased circular migration of Nepali workers to India, the Gulf countries, and Southeast Asia (Adhikari and Hobley 2012). Similar policy lacunae have emerged in other parts of the developing world (Andersson and Gibson 2007; Taylor and Cheng 2012; Robson and Wiest 2014).

The highly economistic orientation of explanatory frameworks of ‘the rural’ that predominate in the literature, understands many outcomes including migrations to be manifestations of mostly economic forces and incentives (Rigg et al. 2012). Emerging research has begun to address this gap emphasizing the many other sociological and ethnographic features that mediate rural life including social claims on resources, historical labor obligations, cultural patterns of reciprocity, institutions and, in some cases, violence. (Elmhirst 2000; Hoey 2003; Brondizio 2004; Peluso 2008; Alvarado and Massey 2010). Thirdly, a sectoral orientation predominates in analyzing household economies within agriculture, industry, services and forest activities. Because of these overly simplistic and segmented characterizations our understanding of rural spaces does not capture livelihood strategies that engage in a much greater diversity of activities and sources of income and livelihoods as well as spatial complexity (Tacoli 1998, 2007; Palacios et al. 2013). Finally, spatial preconceptions about where different kinds of activities occur, such as farming in rural areas, industry in cities and forestry in forests can be misleading (McGee 1991; Tacoli 2007; Tacoli and Mabala 2010; Rigg et al. 2012).

To avoid these assumptions and misconceptions of rural (as well as of urban) areas and activities, attention needs to be given to the emergence of significant new rural labor markets that are changing income dynamics in urban areas and reanimating rural zones. These can include emerging rural industries of varying kinds, mining, logging and valorization of new commodities like the açai fruit in Brazil, as well as robust clandestine economies including drugs, timber, gold and bush meat. Cross-sectoral approaches are needed to cut across the silos that rural landscapers are often boxed within. Additionally, rural areas should be recognized as having much stronger engagements with both urban and globalized market processes. These engagements come partly through migration and producing transnational 'skill' and true 'remittance' economies. Thus as Rigg et al. (2012, 1469) assert in research and policy we "need to acknowledge the mixed and mobile nature of rural living, the split personality of households, people's hybrid identities, and the diversity of activities in the countryside."

Rural realities may also be misrepresented in studies of migration. Discussions of international and internal migration often focus on rural–urban flows, but in many parts of the tropics there is significant migration from urban to rural, as well as rural to rural migration for wage opportunities especially in the clandestine timber and forest product trades, artisanal mining, infrastructure development and seasonal work opportunities (Padoch et al. 2008, 2014). Rural households may depend on remittances from urban workers in money and in kind, and urban workers may require rural subsidies. With household members present in both rural and urban areas, as waged labor and production in rural areas alone rarely supports all resident households, the definition of households as either 'rural' or 'urban' is more difficult and ultimately inaccurate; hence an increasing use of the terms 'multi-local', 'multi-sited' or 'translocal' by scholars of migration and migrants (Greiner and Sakdapolrak 2013a, b; Padoch et al. 2008; Thieme 2008; Elmhirst 2011; Brondizio et al. 2014). Multi-sited households permit management of an array of resources and work opportunities and effectively reduce risk and extend household income sources. In their study of 483 rural households in the Brazilian state of Amapá, Pinedo-Vasquez et al. (2009), Pinedo-Vasquez and Padoch (2009) and Padoch et al.

(2008) found that 83% of them also had houses in the city. Greiner and Sakdapolrak (2013a, b) define these as 'stretched families' whose ranges can embrace transnational, rural and urban homes. The concept of the 'stretched household' helps break down the artificial wall between rural and urban residence, food security, and livelihoods. It approximates a reality in which migrants continue to be members of rural households while forming or joining other households in an urban area, and emphasizes the complex connections between the urban and the rural. Tacoli (2003, 3) argues:

the notion of a 'divide' (between the rural and the urban) has become a misleading metaphor, one that oversimplifies and even distorts realities. The linkages and interactions have become an ever more intensive and important component of livelihoods and production systems in many areas – forming not so much a bridge over a divide, as a complex web of connections in a landscape where much is neither 'urban' nor 'rural'.

2.2 Forest dependence

Definitions of forest dependency are controversial; one often-cited figure suggests that 1.6 billion people depend on forests both wild and cultivated to varying degrees (World Bank 2004; Agrawal et al. 2013). In a rigorous and wide-ranging study of households and communities located near forests, the Center for International Forestry Research's (CIFOR) Poverty and Environment Network project found that in the sample of more than 200 villages in 24 countries, overall, natural forests provide 21.1% of total household income (another 1% coming from forest plantations); 6.4% is derived from non-forest environments (fallows, bush, grasslands, etc.), making a combined environmental income of 27.5% (Wunder et al. 2014a). Whether as regular additions to income and food security, as 'safety nets' or stepping stones out of poverty, the economic importance of forest products has often proven difficult to document. Attempts to capture the degree of dependence sometimes miss contributions that may be small in scale but important to well-being and income. The provision of bushmeat and other foods, medicines, food for animals, construction materials and other livelihood and artisanal goods are examples (Chhatre and Agrawal 2009; Matose and Watts

2010; Mutenje et al. 2011; Hogarth et al. 2013). Further, the volume of forest products in some sites may be low while their contributions to health and livelihoods may be significant (Shackleton and Shackleton 2004; Shackleton and Gumbo 2010).

The intricacy of understanding linkages between forests, demographic changes and migration also reflects the complexities of defining forests and relationships of people with forests. Extensive forest areas can indicate high levels of forest dependence if indigenous populations live there; alternatively, limited forest dependence is found in locales with a history of deforestation and forest recovery, such as El Salvador. Policy and specific contexts can also favor livelihood strategies that produce greater forest dependence. Some examples include the increased use of non-timber and timber resources in parts of Guatemala and Mexico and enhanced markets for forest products such as those in Brazil (Brondizio 2008; Aguilar-Støen et al. 2011; Holder and Chase 2012; Prado Cordova et al. 2013). Variation in patterns among individuals, households and communities in different rural, peri-urban and urban contexts also deserve broader recognition, as household and community use of and dependence on forests varies greatly. In the developing world, forest dependence may be flexible and change over time, and it can shift with age, ethnicity, class and gender. How migration affects forest dependence is still poorly understood. What studies have been done, suggest that migration can both increase and decrease peoples' engagement with forested landscapes depending on context (Mathews 2011).

2.3 Migration

Human mobility takes many forms and households can, and do, participate in several forms of migration simultaneously (UNDP 2009; Kelly 2011). Migration can be external (international) or internal (within country). People migrate to find temporary work, i.e. labor migration or, when work opportunities change with the seasons (seasonal migration). While much migration is voluntary, it may also be impelled or imposed by difficult conditions, conflicts or disasters, or may actually be involuntary or forced migration. Much rural–urban mobility takes the form of 'step migration', that is, a series of shorter or less drastic movements from the place of origin to the

destination. Often, for example, step migration involves movement by stages from a village to a nearby town, on to a regional city, and finally to a more-distant city. Many movements are part of a chain migration with one household or village member facilitating the movements of other family members to a new home. However, it is important to recognize that significant migration flows go from small settlements or villages directly into international venues or megacities. Such leaps may in some cases be facilitated by labor contractors and are often a feature of human trafficking. A pattern that we discuss in greater detail in this paper is circular migration, that is, recurring movement between sending areas and migration destinations.

Migration takes many forms in vastly different contexts that "determine the duration, destination and composition of migrant flows" (Tacoli 2011, 5). Migrations differ by scale and timing, ranging from small groups moving over an extended time to sudden mass movements (IOM 2013). Whether the movements are temporary or permanent may be determined by the extent to which migrant rights are protected in origin and host areas, cyclic or permanent shifts in regional economies, formal and informal policy infrastructures and political instability. Migrants and migratory processes differ by class, gender, culture, resources, occupations and destinations, as do the networks and institutions that mediate migration. The multiple pathways, flows and intensities of migration, therefore, lead to a great variety of economic and environmental outcomes. Since the desire to facilitate international and regional mobility is part of the G20 agenda, migration at all scales and in its many configurations is likely to increase (World Bank 2013).

Despite the fact that a large proportion of the global population has or is engaged in some form of migration, migrants are often perceived unfavorably (UNDP 2009). Despite the economically positive contributions migrants often make, they are often not welcomed by residents or governments of receiving areas. The reasons for negative opinions of migrants are myriad and well beyond the scope of this paper. Views in sending countries are often no less negative. Governments see outmigration often as a source of shame, an indication of failed policies; sometimes

alarm is voiced about perceived shortages of labor for agricultural production in areas of outmigration. In part, views may stem from a lack of understanding; the term ‘migration’ may suggest that a move is permanent, which in earlier 19th and 20th century diasporas was largely the case. Today much migration is temporary; ‘mobility’ or ‘movement’ of people perhaps better describes the impermanence and increasingly circular nature of migration (UNDP 2009). Tacoli (2011, 5) suggests migration should be defined as: “an adaptive response to socio-economic, cultural, political and environmental transformations, in most instances closely linked to the need to diversify income sources.” No one definition captures the complexity of migration, so the ability to reliably measure migration remains a challenge.

Economic and other benefits of migration can go beyond the migrants and their families, stimulating economic growth, rejuvenating populations and workforces, contributing to job creation, and reducing poverty both directly and indirectly in both home and host locations (de Haas 2007; ILO 2010). Further benefits to individuals, families and communities can be obtained through the exchange of knowledge and ideas, as well as through networks developed as a result of mobility. The potential of migration to spur development has been recognized internationally through forums such as the UN High Level Dialogue on International Migration and Development and the Global Forum on Migration and Development (Alonso 2011). These initiatives recognize the benefits and trade-offs of migration, emphasizing the need to understand each in order to formulate appropriate policies (UNDP 2009).

2.3.1 International (external) migration

International or external migrants are commonly considered to include anyone living in a country different from the one in which he or she was born. The United Nations developed a relatively standardized database, based on this definition, for identifying the number of global migrants over the last five decades (UNDP 2010). The data showed that international migration rates have been steadily increasing, with a 3.2% rise in 2013 compared to 2.8% in 2000 (United Nations 2013). In 2013, the global stock of international migrants was around 231 million, accounting for 3% of the world’s population (UNDP 2009; Vargas-Silva 2014). Global migration affects all parts of the

world. Over the last two decades, the growth rate of migration in tropical countries has been robust. Datasets at a macro level indicate that many regions and countries are simultaneously source, transit and destination locations. International migration, like all migration, is driven by complex factors which may reflect economic differentials and opportunities, economic downturns, political instability or structural economic constraints on potential economic mobility. Socio-cultural constraints also serve as barriers or incentives to migrate, e.g. prohibiting or encouraging the migration of people of certain genders, ethnicities, ages, classes or political views. The International Labor Organization (ILO) estimated that over 50% of international migrants are economically active (ILO 2010).

These official estimates of migrant flows fall short of the true numbers; undocumented migrants include those who have not been officially recorded and those without formal documents. As policies on immigration have become more restrictive globally, the number of migrants living undocumented in host countries have increased; such trends are yet another distinctive trait of recent migration patterns (Alonso 2011; Kelly 2011). It is estimated that in the United States, for example, almost 30% of all immigrants are undocumented (Passel and Cohn 2008).

Another important aspect of international migration is risk. The risks inherent in migrating to another country can be far greater than if movement is confined to the home country. The initial financial investment in travel and living expenses in a foreign country can be considerable. Risk is further dependent on pre-existing finances and social networks, job opportunities, and distance from home. Jokisch (2002) reported that in the late 1990s, Ecuadorian emigrants were taking loans of up to US\$9000 to pay smugglers for travel to the United States. This cost is considerable when compared to the annual wages of Ecuadorians at the time, which averaged US\$3324 from 1995 to 2011 (Trading Economics 2015). These loans were also said to be associated with a 5–8% interest rate compounded monthly, thus exacerbating the necessity to find employment as quickly as possible. Therefore, depending on a number of factors including safe arrival, ability to find work, sufficient money, etc., it may be some time before migrants realize any benefits from their international ‘leap of faith’ (Jokisch 2002).

International refugees represent another type of migrant, one impelled to flee due to security risks in their home countries. In 2013, it was estimated that 15.4 million refugees were settled in a neighboring or receiving country (United Nations 2013). Refugee migration is typically triggered by a key event such as conflict or natural disaster, leading to a mass exodus within a short time frame (fast-onset migration). Recent alarms claiming that climate change is leading to ever increasing numbers of ‘climate refugees’ – up to 200 million people by 2050 (Myers 2002) – have been largely discredited (Stern Review Team 2006; Foresight 2011); we further discuss these issues later in the paper.

2.3.2 Internal migration

Internal migration is defined as the movement of people from one area to another within a country. Scholars and development practitioners consider data on internal migration to be less reliable than data for international migration. In contrast to existing national datasets on fertility and mortality, data repositories on labor mobility within countries are rare or non-existent (Bell and Charles-Edwards 2013). This situation is exacerbated by the lack of international standard procedures for data collection on migration and mobility. Problems arise because of differences between countries in the types of data available, the intervals at which migration is measured, and the statistical geographies in which migration is described (Bell and Charles-Edwards 2013). Further, much internal migration, because of its complex and varied forms, is largely invisible.

Despite these data limitations, experts believe that there are many more internal than external migrants. General estimates suggest that two or three times as many people engage in internal migration as in international (Bremner and Hunter 2014), although in 2005 one estimate put the number of internal migrants on the move inside nation-state boundaries at some 763 million, that is, almost four times the number of external migrants (Bell and Charles-Edwards 2013). Whatever the specifics, the significance of migration as part of social and demographic change within countries is considerable.

Migration in all its variants, remains inadequately integrated into national and local development frameworks and into research on shifts in

environmental parameters and forest resources (Tacoli 2011). For example, internal migration is often characterized by circular migration patterns, that is, by temporary and often recurring movements between home and host areas, while seasonal migrations occur with fluctuations in food security and household survival strategies during different agricultural and work seasons (Tacoli 2011). Such systems of circulation allow households to access distant resources or different labor markets while simultaneously taking advantage of local resources and work opportunities. The income earned in circular migration can improve the general welfare of household members and buffer external shocks. However, as with external migration, circular migration can also create a burden on family resources expended to support migrant members, especially for travel and administration costs, in anticipation of their becoming financially self-sufficient.

2.3.3 Rural to urban movements

While much of the recent surge in migration is due to increased rural to urban movement, the flows of people, goods, information and ideas between rural and urban spaces are not unidirectional. Flows between urban and rural areas overlap, linking differing sectors and local economies (Tacoli 2011). As mentioned above, simply defining rural and urban places is difficult and not standardized across national contexts. For instance, Peru defines urban areas as populated centers with 1000 or more dwellings; Botswana requires a population of 5000 or more inhabitants for a city and specifies that 75% of economic activity must be non-agricultural (UN STATS 2005). These areas might actually capture areas similar in size and population, but the definition makes it difficult to tell. In Nicaragua, urban centers are further defined by the provision of streets with electrical lighting (UN STATS 2005). Moreover, in some countries definitions have changed in recent years. When this happens in as populous a country as China (as it has recently), this causes massive shifts in the global numbers and has dramatic effects on global urban–rural population estimates.

In spite of all these variations, complexities and uncertainties, there is no doubt that urbanization (like migration) is increasing rapidly and globally. The world’s population has recently been declared predominantly urban: half the world’s people, about 3.5 billion, live in urban areas (UNFPA

2007). Urban areas have grown in relation to rural areas everywhere; that disproportionate growth is expected to continue. The shift from rural to urban in relative demographic importance is not due to migration alone; urban areas have also been growing due to natural increase and to spatial reclassifications of administrative areas. That is, many previously rural places are becoming urban and being reclassified. However, urbanization and migration are occurring at neither regular nor equal rates throughout the tropical world. Most South American countries are already highly urbanized, while Africa and South Asia are still largely rural and urbanizing, as illustrated in Figure 1. Future urban growth is expected to largely take place in Asia and Africa, much of it in the small cities and towns that lie in or near tropical forests (United Nations 2011).

Urbanization does not seamlessly integrate the rural with urban but creates strong linkages and multiple flows between them. Rural places continue to be sites for important household livelihood activities, including production of food for both urban and rural dwellers, of rural waged labor and they serve as refuges in the absence of urban safety nets. Urban sites may finance and organize access to rural resources, as small cities function as labor depots for hinterland projects (Browder and Godfrey 1997; Myers 2008; Limonad and Monte-Mor 2012; Christiaensen et al. 2013). Urban areas also function as destinations for seasonal migration, markets for rural commodities and places for collecting pensions, conditional transfers and remittances, centers for myriad social services including health care and education, as well as consumption markets with shops, cafes and entertainment.

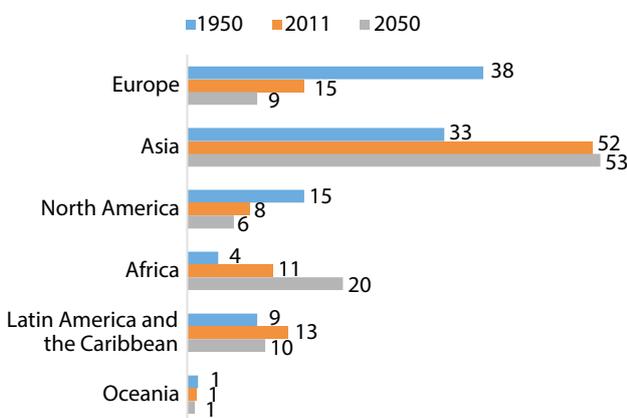


Figure 1. Distribution of the world urban population by major area, 1950, 2011, 2050.

Source: United Nations (2011)

2.4 Who is moving? Age and gender of migrants

Globally, both generational and gender migration trends affect forest and livelihoods. Most international migrants are believed to be of working age. In 2013, 171 million international migrants, constituting 74% of the global migrant population, were formally ascertained to be between the ages of 20 and 64 (United Nations 2013) although both younger and older migrants may conceal their true ages to qualify for employment. Migrants aged between 30 and 39 years were the largest group in both developed and developing countries. These generational trends are not surprising as the vast majority of migrants are assumed to be economically driven, including those in search of educational opportunities. Large-scale migration of younger people often results in 'geriatrification' of rural agricultural and forest areas with land ownership and rural labor left to the old (Rigg et al. 2012). The impacts of such trends vary; some studies point to a resulting rise in land abandonment and decrease in land productivity while others find emerging patterns of sharecropping and leasing, the strategic use of remittances to slow rural exodus and consolidation of land into larger holdings (Carbera et al. 2012).

The gendered nature of migration has been changing and has been a topic of study for decades (Chant 1992; Chant and Radcliffe 1992). In 2013, women accounted for 48% of the global migrant stock (United Nations 2013), but regionally there is much variation in the gender composition of migration flows. While the percentage of female international migrants is high in Latin America and the Caribbean (51.6%), male migrants outnumber female migrants in Asia (58.4%) and Africa (54.1%). In recent years, the number of male migrants has rapidly risen in Asia. Since 2000, the annual increase in the number of male migrants in Asia (3.1%) far exceeded the increase in the number of female migrants (1.9%). This trend is attributed largely to the strong demand for male migrant workers in oil-producing countries (United Nations 2013).

When we consider age and gender together, other global patterns emerge. Women are underrepresented among migrants of working age in the developing world, as they accounted for only 41% of all international migrants between 20 and 64, although again considerable regional variations exist. Asia shows the lowest proportion of females among migrants (39%) of working age, followed by

Africa (44%). Latin America and Caribbean recorded the highest share with 52% females among migrants between ages 20 and 64 (United Nations 2013).

Women workers have been rising as a proportion of the total developing country agricultural workforce. According to Agarwal’s analysis of FAO data, men have been moving to non-farm jobs more quickly than have women. Figure 2 below shows that women workers constitute a growing proportion of the total agricultural work force across much of the developing world. In the case of Asia, this trend is hardly perceptible; in Oceania and South America, it is substantial. Agarwal argues such trends suggest we are moving towards the ‘feminization of agriculture’ (Agarwal 2011, 7). DeSchutter’s (2013) analysis of data from the ILO suggests that while male outmigration may be one aspect of this, employment in agriculture is decreasing significantly faster for men than for women.

At the household and community levels, key areas of research include gender, class and age differences in household decision making as a result of migration, including decisions to migrate, labor market segmentation, the gendered dynamics between migrants and those who stay home, and continuities and changes in gender relations as a consequence of migration. Opportunities for women to migrate and/or the physical absence of men from the household while migrating may alter gender ideologies, divisions of labor and may enable unprecedented ‘voice’ and ‘choice’ for women (Chant 1998; Hadi 2001), as can women’s capital and cash contributions (N. Peluso, pers. comm. 2015). Resurreccion and

Van Khanh (2007) and Elmhirst (2007), however, have found that gendered negotiations that take place between those who migrate and the ones left behind are complex; thus gendered identities, roles, and obligations may be reproduced despite migration. Such observations have led Ge et al. (2011) to conclude that so-called ‘social remittances’ do “not easily convert into new leadership forms of collective action since return migration remains firmly embedded within strong gender, class, kinship alliances that constitute the communities’ sense of collectivity” (p. 134). Such patterns were also evident in Nepal (Adhikari and Hobley 2012) In many cases, while women may nominally control agriculture, they may not enjoy tenurial rights or complete control over the products (or income) of their work.

It is not unusual in Latin America for sending communities to have lost 60% of their young men, nor is this level of outmigration unusual in Africa and Asia (Elmhirst 2000; Kandel and Cuellar 2012), though it varies by country, region, district and even within villages. For instance, in Nepal, migration is male dominated, with women constituting a mere 6% of the total migrant worker population in FY 2011/2012 (Sharma et al. 2014). Sijapati Basnett (2013) argues that the dominant numbers of men in seasonal and circular migration patterns can be explained by the structure of pull factors including gender segregation of labor markets and lack of opportunities for women outside of the domestic sector in receiving/ destination countries (e.g. in the Gulf and Southeast Asia). The numbers are also influenced by push factors, namely household and community norms that stigmatize women who work abroad, governments’ ambivalent and paternalistic stance towards women working overseas, or, as is the case in Nepal and elsewhere, the rampant sexual and other abuses faced by, for instance, women working in the Gulf states as reported by the mainstream media. As Hobley (pers. comm. 2015) has pointed out, legislation in 2012 bans Nepali women under the age of 30 from migrating, though the flows out have not stopped, they may have been reduced or underreported. At community and household levels, decisions over who migrates and who stays behind are mediated not only by age and gender, but also by education, marital status, preferences, ethnicity, religion and language, policies and market conditions. Many aspects of these processes and socio-cultural influences may affect forest management and land use.

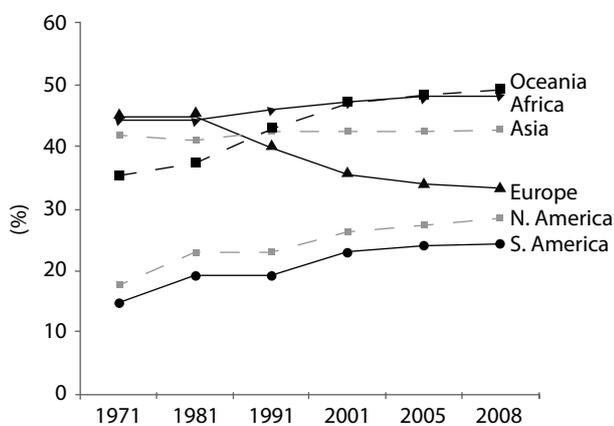


Figure 2. Percentage of women in agricultural labor force.

Source: Agarwal (2011:10)

2.5 Remittances

Labor migrants often send remittances or transfers of funds to their families or other recipients. Monetary remittances supplement incomes and have become an important safety nets in many areas, especially in a context of state policies that most affect the poor (credit, transport, marketing boards, rice supports) as part of neoliberal trade and cheap food policies (Carroll and Bebbington 2000; Bebbington and Batterbury 2001; Bebbington et al. 2006; Hecht 2014a). Most data and discussion of such remittances center on financial flows through formal money transfer systems.

Remittance datasets suffer many of the same limitations as those dealing with migration. The ability to capture formal international financial movements is notably better than those transferred internally or clandestinely. Information on international remittances varies across regions and countries. For many countries the information is either inadequately captured or not captured at all. Despite these data limitations remittances are known to be a key source of external resource flows for developing countries (World Bank 2013). It was projected that international migrants sent more than 436 billion dollars in formal remittances in 2014, representing a 7.3% increase over 2013 and, although flows were more volatile during recent economic downturns, remittance fatigue seems to not have occurred (World Bank 2013).

Remittances sent by migrants globally are triple the funds received from official development assistance (World Bank 2013). Were migrants a country, their collective gross domestic product (GDP) would place it among the 30 or so largest economies. Furthermore, the rate of growth of this remittance-GDP would make them one of the most dynamic economies in the world. In several countries of Asia, Central America and Africa remittances are larger than the earnings from any single commodity or export. In 2013, they exceeded foreign exchange reserves in at least 14 developing countries, and reached at least 50% of the level of reserves in more than 25 developing countries (World Bank 2013). India and China have the largest international remittance flows globally, with each receiving over US\$60 billion in 2012 (see Figure 3). However, data on remittances as a proportion of the GDP may show more clearly how important migrants are to particular national economies. For example, remittances contributed over 53% of Tajikistan’s overall GDP in 2013 (Figure 1b). At the household level studies carried out in Central America and Southern Mexico show remittances essentially double migrant households’ income (Hecht et al. 2012). Research among some households in Nepal showed remittances contributing a third of household incomes (Adhikari and Holey 2012; MoLTM and IOM 2010).

Since 2006, the scale of international remittances has inevitably made them central to international migration and development debates. Remittances are assumed to improve welfare and incomes,

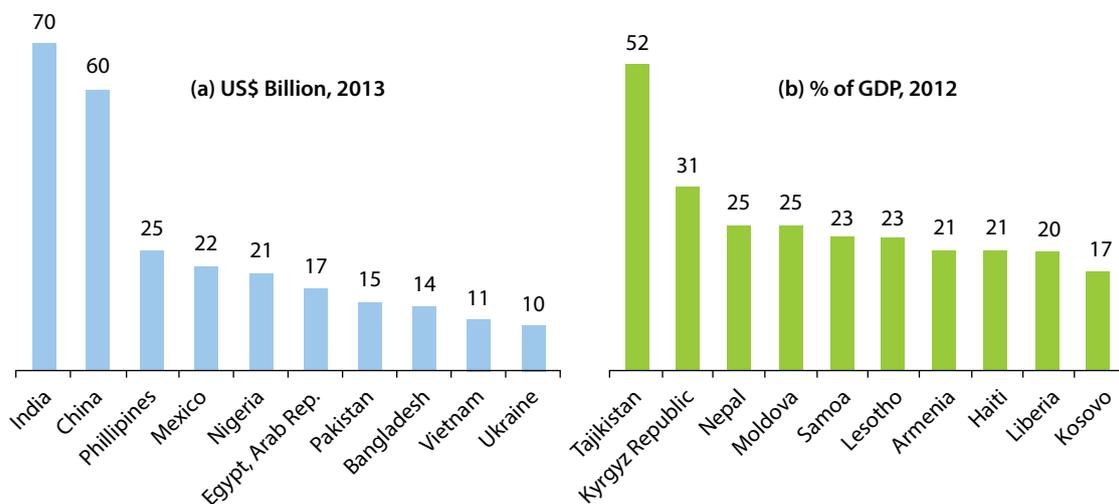


Figure 3. Top 10 recipients of migrant remittances in 2013 (US\$ billion) and remittances as a percentage of national GDP in 2012.

Source: World Bank (2013)

and to be a major factor driving development from below and poverty alleviation. Nevertheless, not all migrants remit funds to their home households, with some migrants more likely to send money than others. Studies indicate that those involved in cyclic migration in the South are more likely to remit greater proportions of their incomes, thus contributing to development in their places of origin (Hujo and Piper 2007; Dustmann and Mestres 2010; Montefrío et al. 2014). International remittances potentially provide an economic boost, more cosmopolitan skills (with sending and possibly investing money), and different consumption patterns as a part of a remittance bundle (Rose and Shaw 2008; Jagger et al. 2012; Skeldon 2012; Posel and Marx 2013).

Few reliable datasets exist on the size of internal remittances, thus their importance in poverty reduction may be underrated (Esipova et al. 2012) in relation to the contribution of international remittances that are far more widely recognized and visible (World Bank 2013). There are also other debates over the importance of internal versus external remittances. For instance, while some argue that internal migrants are generally more inclined to send and receive remittances than are their international counterparts (Esipova et al. 2012), in South Asia international remittances were found to be important for sustaining both economies at the national as well as local level, and to actually be fueling internal migration in Nepal (Adhikari and Hobley 2012).

The reliability and ease of sending remittances varies a good deal. Nation-state volatility, corruption, lack of rural banks and wire services, and external sanctions can disrupt or preempt remittance flows. Governments can influence remittance transfers and receipts, the channels by which they arrive, and their uses once they have arrived. Government interventions are likely to increase as the benefits of remittances become better known (Aparicio and Covadonga 2012), especially where corruption, weak institutions or political instability limit other forms of investment. The cost of sending remittances can be a further barrier. For instance in sub-Saharan Africa the average cost of sending remittances is around 12% of their total value, whereas the global average is around 9% (World Bank 2014). The G20 have set out to reduce these costs to 5% over 5 years but progress has been slow indicating a continued effort is needed to lower the cost of global remittance transfers.

2.5.1 Non-monetary remittances

Economic analyses and policy recommendations based on purely financial remittance flows can be misleading (Brown and Conneil 1993). Remittances can take the form of in-kind goods, resources, skills and connections. Largely unrecorded, flows of in-kind remittances are often associated with the informal domestic sector and can have important impacts on local economies as well as on the well-being of households (Ellis 1998; Taylor 1999). For instance, a nationwide study on rural–urban migration in the Pacific island country of Vanuatu showed that the vast majority of respondents in both rural and urban areas relied on in-kind flows. These consisted largely of fish, staple crops and meat moving from rural to urban areas, and manufactured and imported goods from urban to rural. Urban and rural respondents agreed that rural areas benefitted from higher and more sustained flows of cash and goods because individuals who enjoyed financial success were mostly concentrated in urban areas and were expected to help their families in their home islands. The cultural imperative of having to contribute to family well-being functioned as a medium of redistributing wealth to rural areas. At the same time, these relations were based on a strong ethos of reciprocity, and families and clans in rural Vanuatu were also expected to send goods to urban areas (Sijapati Basnett 2009). In-kind remittances were also an essential exchange between rural households in Kenya (Djurfeldt and Wambugu 2011). Transfers of food, more specifically maize, while identified as a drain on the food resources of sending households, were critical food sources for receiving households. Andersson (2011) argues that in-kind remittances serve as an “important redistributive mechanism for food across space”, which can be assumed to have an impact on land-use decisions. Smallholders may have substantial responsibilities for producing food for urban-based relatives, but these again often remain unrecognized in research and among policy makers (Andersson 2011).

2.5.2 Social remittances

Recent studies demonstrate that, over time, networks, institutions and a culture of migration tends to develop and social remittances are exchanged (Massey et al. 1993; Levitt 2001; Kandel and Massey 2002; Vélez-Torres and Agergaard 2014). Social remittances can be

understood as “ideas, behaviors, identities and social capital that flow from receiving to sending country communities” and also vice versa (Levitt 1998, 929). Social networks facilitate movements through employment, accommodation and forms of social protection (Tacoli 2011). For many young adults migration is a rite of passage, a pathway to new forms of knowledge, or a ‘college of the poor’ that emerges not just as a significant household economic strategy, but also as a cultural pattern (Kandel and Massey 2002; Bouahom et al. 2004; Rigg et al. 2012; Johnson 2013). Social remittance flows may move from urban to rural places and affect relationships of migrants and others with land and forest resources. Similarly the ideas, knowledge and values held in migrants’ places of origin may influence a large number of behaviors in urban communities (Padoch et al. 2008; Levitt and Lamba-Nieves 2010).

Studies on social remittances are still few when compared to the literature on financial remittances. Nevertheless, studies such as Montefrio et al. (2014) indicate how ideas and values acquired in the course of migration have impacts on natural resource perception and use. Their analysis of cyclical migration among Filipino oil palm workers in Malaysia identified the effect of the transfer of ideas on land-use decisions. Social

remittances influenced farmer decisions to engage with the oil palm industry in the migrants’ home countries, resulting in a switch from previous smallholder agricultural practices to engagement with large-scale mono-cultural plantations (Montefrio et al. 2014).

Furthermore, values favoring urban identities and patterns of consumption may devalue rural activities, undermining the sustainability of some patterns), or furthering agricultural retraction (Radel and Schmook 2008; Schmook and Radel 2008). Alternatively, other economic options and environmental values may also emerge as a result of migrants’ learning about them in the destinations where they are working, such as payment for environmental services, eco-based tourism, or other kinds of environmental activities (Hecht et al. 2012). Some kinds of social remittances can add an environmental connotation to existing practices (Delgado and Rommetveit 2012; Kolahi et al. 2014). But ongoing research on forests and migration led by CIFOR and the Center for the Study of Labour Mobility (CESLAM) in rural Nepal, is finding that most migrant workers find the skills and experiences that they learn overseas are disconnected from their village lives and, therefore, not immediately transferable (Sijapati Basnett et al. forthcoming).

3 Conceptualizing migration and forests

As the discussions above illustrate, consideration of the effects of migration, urbanization and remittances on forests and forest villages engages literatures that rarely overlap. Several reviews that attempted to apply general migration theories to comprehending the relationship between migration and forests (Massey et al. 1998) concluded that different theories work well to explain certain changes, at certain times, in certain places, but that the “causes of migration essentially differ in different regions and empirical circumstances” (Black et al. 2011, 5). Castles (2011) suggests that such attempts to find an overarching theory of migration are “rooted in a sedentarist notion of the world in which migration is seen as a problem or exception from the norm, which needs explanation” (quoted in Black et al. 2011, 5). Such notions that view staying in one place as the ‘normal’ condition fail to acknowledge that migration has habitually been a livelihood strategy (Castles, quoted in Black et al. 2011). The specific relationships between migration and natural resources are linked not only to the natures of localities, territories and livelihoods in intricate ways, but also to macro policies of trade, labor markets and globalization.

The apparent neglect of migration and multi-local livelihoods in forest-based research has not only epistemological but also practical roots. Studies and interventions are often based on ecological systems (e.g. watersheds, landscapes) that are scaled differently from ‘human systems’ (e.g. rural–urban and transnational migrations). In addition, multi-local livelihoods complicate the boundaries of human–environment systems. Property rights and access mechanisms to forests are often assumed to be held only by people currently living in the vicinities of those forests; migration thus becomes invisible because parts of the population are away.

On the other hand, a common characteristic of studies that focus on migration as driven by environmental change, is that they assume a

linear relationship between the two, i.e. that environmental change directly causes migration, or vice versa, with little recognition of the array of other forces and the facilitating, inhibiting factors and new adaptations that are at play. This shortcoming tends to be true in the case of forest-focused studies as well. Research limitations such as these are addressed in more recent work by Carr (2005), McLeman and Smit (2006), Perch-Nielsen et al. (2008) and Warner et al. (2010). These studies aim to go beyond simplistic assumptions that people who experience negative environmental changes will be forced to migrate (Black et al. 2011). As we noted above, a popularly cited but recently much-criticized paper predicts that by 2050 as many as 200 million could be displaced due to climate change linked to environmental degradation (Myers 2005; Stern Review Team 2006; Foresight 2011). Therefore instead of focusing on single-factor causes of migration, we should seek to understand the multiple dimensions that connect migration with the natural environment. Black et al. (2011) argue that attention is better paid to “the range of drivers that might affect the volume, direction, and frequency of migratory movements, on one hand, as well as the different levels of analysis at which migration might be considered as influencing forest change, on the other” (p. 5). A multi-dimensional approach can be used to understand these different drivers and levels of analysis: *environmental, social, political, demographic* and *economic*. Economic dimensions include opportunities for employment and income differentials. Political drivers include conflict, instability, and also the politics underpinning public or corporate policy. Demographic drivers include the size and structure of populations in source areas in relation to available land and off-farm employment opportunities. Social drivers incorporate familial and cultural expectations, and practices and the aspirations of young people to have better and different lives than their parents. These desires may stem from ‘social remittances’ as well as a

result of seeing different life choices in the media. Lastly, environmental factors include exposure to hazards and availability of ecosystem services. These five dimensions are interlinked and the boundaries between and within them are blurred. Shifts in any dimension, whether environmental, social, political or economic, will not necessarily ‘cause’ migration but may ‘amplify’ (or perhaps modify) already existing spurs to migrate (Black et al. 2011)¹. Here we assess both the role of forest change in influencing migration, as well as the implications of migration for forests.

3.1 Environmental dimensions

In their discussions of the environmental dimensions of migration, Black et al. (2011) focus on two issues: exposure to hazards and the provision of ecosystem services. Hazards may be environmental events such as floods, hurricanes, tsunamis or earthquakes. Changes in the availability and quality of ecosystem services will influence land productivity, food security and habitability. Historically, environmental resource depletion has instigated some decisions to move (Wolpert 1966). However ‘exposure’ and ‘adaptive capacity’ to any environmental shock are not fixed, and such events may result in a range of differing migration outcomes (Perch-Nielson et al. 2008; Black et al. 2011). Indeed, migration and the array of social capitals, networks, and remittances involved can also act powerfully to enhance resilience to environmental events (Nelson et al. 2007; Black et al. 2011; Geddes et al. 2012a,b). Forests often act as buffers to floods and other environmental extremes just as they have a long history of providing sustenance in times of harvest failure and refuge for political refugees (see Box 1).

Overall, the environment–migration nexus is generally better understood for fast-onset environmental changes in part because mitigation efforts and relief rapidly quantify the level of needs. A relatively large number of scientific publications on environmental change and migration feature fast-onset changes (Hugo 1996; Kane 1995; Groen and Polivka 2010). Slow-onset changes, such as climate change, land and forest degradation, rising sea levels, and the responses to them, are still poorly understood. Many analysts have attempted to address these challenges recently by systematically analyzing

Box 1. Forests as environmental buffers.

Vulnerability to environmental changes can be defined as both a measure of exposure to hazard, and of coping capability. Forests, as buffers, can provide means to mitigate and adapt to and reduce vulnerability to environmental hazards (Black et al. 2011). As natural capital, forests may also reduce the necessity of choosing migration as the way to cope with environmental change.

Studies done in Niger, whose populations have a long history of migration and drought vulnerability, show that more than 5 million hectares of forests have been planted since the 1980s both for livelihood, rural stabilization and environmental buffering as part of farmer-managed natural regeneration practices (Haglund et al. 2011; Onojeghuo and Blackburn 2011; Sendzimir et al. 2011). Benefits of this afforestation were seen in the resilience of people during the 2005 droughts in the Maradi and Zinder regions of Niger. The mass migrations, high mortality and livestock losses that had occurred in previous drought events were largely avoided (Sendzimir et al. 2011). Various studies have also highlighted the role played by coastal ecosystems such as mangrove forests and coastal forests, in general, in protecting low-lying coastal areas and coastal communities (Cochard et al. 2008; Barbier 2015) including post-tsunami replanting of mangroves as a buffer for storm surges in Thailand (Barbier 2008), again presumably making outmigration and abandonment less necessary.

Migration itself however, may increase the vulnerability of forests to climate shifts and other changes. Uriarte et al. (2012) showed that in the Peruvian Amazon, migration out of rural areas increased vulnerability to fire outbreaks; there was an observed correlation between absentee land ownership and the probability of destructive fire. Similar problems with fire and forest management have been described for Mexican forests (Mathews 2011).

the relationships between slow-onset changes, such as changes in climate variability and migration (Feng et al. 2010; Marchiori et al. 2012). Marchiori et al. (2012) studied slow-onset weather changes over 40 years of cross-country panel data for sub-Saharan Africa. Single-driver approaches in the context of massive structural change, however, can be profoundly misleading. In the migration–

¹ Note this distinction will depend how the migration factors were portrayed in the literature.

environmental nexus context, climate events and outmigration are phenomena that capture headlines and the correlations, whether verifiable or not, as they are easily grasped. The deeper dynamics that affect mobility are much more complex.

Discussion of the role of forests in mitigation of and adaptation to climate change is prevalent in the wider literature, especially in studies on reducing emissions from deforestation and forest degradation (REDD+); these discussions, however, rarely feature migration as a positive factor. Where migration is featured in forest studies, deforestation is often assumed to be an outcome of immigration, and in-migrants are often identified as woodland destroyers. Out-migrants can also be depicted as saviors, with forest resurgence a positive outcome of outmigration. These simplistic representations assist neither understanding of the complex relations between forests and migration, nor do they shed light on the reasons and effects for movements into and out of forest areas.

3.2 Economic and management dimensions

The ILO (2010) estimates that most migration is driven by economic incentives and a large literature explores the economic concomitants of mobility. Differences in wages and incomes are important drivers migration. Where economies are growing rapidly and the differences between rural and urban incomes are great, as recently in China and other parts of Asia, as well as increasingly in Africa, income differentials tend to be the most powerful drivers of migration, (Massey et al. 1993; Black et al. 2011). However, as we have remarked throughout this paper, the pull of economic opportunities alone cannot trigger all migration. For instance, in China migration patterns have recently been greatly facilitated by fewer institutional restrictions, by better transport facilities (Bell and Muhidin 2011; Meng 2012) and by specific policies to move millions of rural residents to cities. While much migration can be attributed to economic rationales, as well as other intervening factors, it is the outcomes of those livelihood choices and potential investments that can influence forest and other natural resource management both in origin and destination locations. Moreover, how choices to migrate affect forest use and management may depend on the economic opportunities made available not only to the migrants, but also for those remaining in or returning to their rural homes.

As mentioned above, much mobility in rural and forested areas takes the form of circular migration and multi-locality. The complexity of economic changes, resource use and impacts on forests under circular migration with its variable labor flows remains relatively unstudied. Case studies on circular migration and specific natural resource uses focus on changes in the use of, or relation to, specific resources such as timber (Jagger et al. 2012), but relatively few studies focus on resulting changes in forest management or agricultural activities. Padoch et al. (2008) found evidence that consumption and building demand by new migrants to cities in Amazonia was changing forest management regimes. Robson and Berkes (2011) found that managed agricultural and forest matrices enhanced diversity, while the labor pull back associated with migration produced more forest cover albeit with less biological diversity. Greiner and Sakdapolrak (2013b) analyzing several sites in Kenya pointed to variable outcomes in management that were site, regional economy, and gender dependent. Similar findings were also reported by Mathews (2011), Radel et al. (2010), and Hecht et al. (2012). Brondizio's (2008) work on açai palm fruit management also showed how circular migration works within the regional supply chain and through kinship networks linking urban and rural households. He documented the shift from a dominance of palm heart and manioc production patterns, to the growth of complex açai palm agro-forests in the Amazon estuary largely due to new consumption patterns introduced to cities by rural migrants. Most of the literature on circular migration points to population movements and household labor or to the availability of remittances, but has little to say about forest dynamics in these contexts.

Remittances received by households in sending areas are used for both consumption and as micro-capital, for daily household needs, substituting for agriculture, hiring of laborers, etc. In the 'new economics of labor migration' framework, it is theorized that smallholder farmers will use remittances to invest in land to increase agricultural intensification and or to transition to cattle ranching (Davis and Lopez-Carr 2014). Thus, while there may be an initial loss of the household's locally available agricultural labor at the outset of migration, evidence from both Morocco and Ghana shows this can be offset once remittance flows allow investment into agricultural inputs (de Haas 2007; Tsegai 2004; Deshingkar 2012). However the use of remittances

Box 2. Migration, remittances and livestock.

Livestock production is an area of potential investment of remittances that may have profound impacts on forest cover. Livestock are highly fungible resources with low labor demands that can function as assets, bank accounts, collateral investments in both production and exchange uses, for capturing or occupying land to assert ownership as well as for speculation (Hecht 1993; Turner and Hiernaux 2008; Ibrahim et al. 2010; Roebeling and Hendrix 2010; Todd et al. 2010). The multi-utility of animals of all sizes, and in some cases the ease of management by children and women, also make livestock a popular investment choice for migrants (Hovorka, 2012; Katongole et al. 2013). Davis and Lopez-Carr (2014) found that number of cattle owned was correlated positively with an increase in economic migration. Miluka (2007) and Wouterse and Taylor (2008) similarly found that in some regions international migration was related positively to increases in livestock investments. Depending on whether livestock are penned or allowed to graze freely, such investment into livestock often does not bode well for forests and may be associated with land degradation (Davis and Lopez-Carr 2014). However, in highland eastern Java, for instance, remittance-fueled cattle enterprises are not associated with deforestation, but rather with the growth of tree-grass agroforests – an intensification of government forest management that benefits still-forest-dependent communities, but in new ways (N. Peluso, pers. comm., 2015).

to intensify agriculture production may or may not have negative implications for forests, depending on existing contexts and availability of alternative livelihood strategies (Gray and Bilsborrow 2014). In Latin America migration from rural areas and the receipt of remittances has led, in some cases, to an increase in cash incomes and agricultural retraction that has produced forest resurgences (Aide and Grau 2004; Hecht and Saatchi 2007; Hecht 2009). On the other hand, Gray and Bilsborrow (2014) recently found that outmigration led to an expansion of cultivated areas at both household and community levels in rural Ecuador. Remittances had a countervailing effect with declines in areas of annual crops and increases in the value of remittances (Gray and Bilsborrow 2014). Generally, they concluded

that outmigration and remittances had “mixed, countervailing and relatively weak effects [...] on agricultural activities” (p. 190) The investment of remittances by households including how investment patterns interact with forests needs to be assessed in light of the opportunity costs of other potential applications of funds and diverse interests of households. In peri-urban landscapes, for instance, significant agricultural retraction has occurred, and migrant investment in real estate and housing speculation is widespread. Such landscapes of immigration are seen widely throughout the tropics with many cases documented for Central America and Mexico (Kandel and Cuellar 2012), in the Andes (Bebbington and Batterbury 2001; Rudel 2006) and increasingly visible in Java, Indonesia (N. Peluso, pers. comm., 2015).

These examples suggest some of the ways in which forest economies may ‘work’ in relation to labor constraints, investment possibilities, management practices, ideologies and values, institutions of access, and livelihood strategies of households and communities affected by migration. However, the analytic separation of annual cropping systems from tree systems has been a problem in the conceptual divide between agriculture and forest management. When looking at the impacts of migration and remittances on agricultural intensification, woodland activities typically are not noted, even if they occur in places with extensive agroforestry systems (Gray 2009) and analysts overlook the domesticated natures of many forest ecosystems. Furthermore ‘reductionism’ of forest to single commodities, such as firewood, and using inclusive terms such as ‘natural resources’ often obscures much more complex management regimes (Moran-Taylor and Taylor 2010; Massey et al. 2010). This is exemplified by the study of firewood in a highland area of Guatemala (Moran-Taylor and Taylor 2010).

The impacts of migration on investments in tree management, livelihoods and agricultural intensification remains a significant research lacuna. The impact of remittances on forests depends on a number of factors, but how and under what conditions investment is occurring is often difficult to assess at the landscape level. We know that choices for investment in forestry and agroforestry systems and potential management outcomes will be different across migratory contexts (Aguilar-Støen et al. 2009; Robson and Berkes 2011). Yet, visible forms of intensification

of agricultural production, with activities such as irrigation, machinery and agricultural inputs, are more obvious and widely documented than are more subtle landscape effects and flexibility in investments associated with woodland management (Brondizio 2004).

3.3 Political dimensions

Among the political dimensions of migration, historically, violence and warfare have had important implications for forests and forest communities in developing countries (Peluso and Watts 2001). In the Latin American tropics, guerilla warfare surged and destabilized rural areas and holdings large and small during the region's authoritarian period from the mid-1950s through to the mid-1990s in many areas, and continues today in Colombia and other areas associated with drugs and insurgencies. Africa has been repeatedly convulsed by bloody conflicts in places such as Rwanda, Liberia, Sierra Leone, Sudan and Congo, among others. In Asia, violence has characterized the recent national and forest histories of the Philippines, Thailand, Malaysia, Myanmar, Indonesia, Cambodia, Nepal and China. Political violence has been used to justify the creation of new national forest areas in most of Southeast Asia, in the wake of the wars in this region in the second half of the 20th century (LeBillon 2001; Peluso and Vandergeest 2011). All of these conflicts have produced significant displacements of people, both within and across national borders. The total number of forcibly displaced people worldwide has been estimated to be 51.2 million (UNHCR 2014).

These political dimensions of migration can have several ancillary impacts on forests. Forests can facilitate or prolong conflicts through providing valuable timber and game resources for financing and provisioning conflict (as has been the case in Burma and Cambodia), for patronage (as a reward for loyal followers), transport of weapons by loggers, creation of uneven logging, agriculture and hunting pressures, and deterioration of forest management systems (De Jong et al. 2007; Peluso and Vandergeest 2011; Woods 2011). Forests have become social and economic buffers functioning as refuges for insurgents or refugees who also take advantage of forest resources (Peluso 1992; Richards 1999; LeBillon 2001; Peluso and Watts 2001; Greenough 2003). When the agriculture

frontier is beset by violence forests are further relied on for subsistence as well as protection, as in the Congo basin. In the case of some conflicts, bombing and defoliants have affected forest landscapes (Escobar 2008; Chavunduka and Bromley 2011; Gorsevski et al. 2013). Sánchez-Cuervo and Aide (2013) showed that violence in Colombia improved forest cover as populations fled both revolutionary armed forces and paramilitaries. Forests have a long history of harboring dissidents (Scott 2009; Baral and Heinmen 2006), geopolitical conflict (Lund 2013; Peluso and Vandergeest 2011; Hecht 2013; Rigg 2013) and clandestine activities (see Box 3).

However, it is worth noting that the relationship between migration and conflict is not straightforward. There is no tipping point in level or degree of conflict, beyond which migration (into or out of forest areas) occurs. Those who are most

Box 3. Clandestine economies, migration and forest cover.

Coca cultivation is one of the major drivers of both migration into remote forests and of deforestation in rainforest-rich countries such as Colombia and Peru (Salisbury and Fagan 2013). Growers plant coca in rainforest areas to elude governmental action by camouflaging crops in inaccessible, heavily forested and impenetrable areas of the country. Coca-driven deforestation is dynamic as old forests are destroyed in the first instance to establish the initial crop (Young 1996). Extensive use of chemicals during cultivation may slow the regrowth of vegetation. While coca cultivation per se may not greatly contribute to extensive deforestation in many areas, 'laundering' of coca profits often involves investment in new land uses, thus affecting forests, and coca eradication programs with their promotion of 'alternative crops' may also result in more extensive clearing. It could be argued that migration facilitates such clandestine activities both directly and indirectly. The former could be in the form of in-migration of peoples involved in such activities into forested landscapes. With regard to the latter, as Parry et al. (2010) and others remind us, protecting rural livelihoods and providing incentives for rural people to maintain their rural residence, even if multi-sited, is one of the most effective ways of conserving forests.

vulnerable to conflict may not have the means to move out (Black et al. 2011). Conflict often interacts with other factors such as environmental hazards, poverty, overlapping and unresolved claims to land and the forest, or a young population that may all contribute to mobility and displacement. While political uncertainty, even in the absence of overt conflict, may influence people's decisions to migrate, political stability may act as a pull factor, attracting immigrants (Black et al. 2011).

Understanding the political dimensions of migration and forest dynamics requires a broader contextual understanding of the sites and people being studied and compels us to consider research that has documented the impact of migration on state-society relations and collective action in forested landscapes. Research on 'political forests' in Indonesia is a case in point (Peluso and Vandergeest 2001). Political forests or the demarcation of land into distinct spatial territories (such as conservation areas, production or extraction zones, recreation sites) have been central to state-building process at national and subnational levels in both colonial era and post-colonial Indonesia (Peluso and Vandergeest 2001; Elmhirst 2011). But such state-sponsored demarcations helped legitimize natural resource bureaucracies, and particular forms of power relations and patronage, and condoned and facilitated forest enclosures, removal of forest farmers, indigenous peoples and peasants, and the maintenance of political control over forests and people. Peluso et al. (2012), revisiting a teak forest research site 25 years after an initial study, found that urbanizing forces were reshaping forests and livelihoods that had previously been deeply rooted in forest-dependent rural areas, while exclusion and conflict had characterized people-state relations. They found that though access to forest still made a difference to people's lives and livelihoods, many households had become multi-local, at least at certain times of year, with one or more adult travelling to work, often far afield. As a consequence, new land uses were emerging that were challenging the distinction between private and political forests while villager's increased dependence on migration for income derived in part from destruction of the forest base in the wake of Suharto's fall from power. Political dimensions underpinning migration from and to forest areas range from the highly negative (in the case of state-

sponsored violence against residents or migrants) to the positive (the state sponsoring migration into forest areas to manage and or convert forests to new uses). The politics are complex, however, and neither the decision to migrate nor the condition of forests can be teased out through single variable explanations of either conflict or cooperation as variously positioned migrants move into and out of forests with mixed effects.

3.4 Social and demographic dimensions

As we have noted, the social and demographic dimensions of migration encompass a range of issues related to the socio-cultural drivers that prompt individuals to migrate (Black et al. 2011) from/to forested landscapes, and the effects of migration-induced changes on forests and social relations. Arguably, the exigency to migrate from forested landscapes is high as extreme poverty is frequently concentrated among forest-dependent people (Zhou and Veeck 1999; Mehta and Shah 2003; World Bank 2003; Sunderlin and Huynh 2005; Sunderlin et al. 2005). Migration provides access to alternative or additional sources of livelihood (Clemens et al. 2015).

Parry et al.'s (2010) study in the state of Amazonas in Brazil serves to illustrate the link between drivers and effects on forests. The research showed that rural migrants were moving nearer to cities due to sustained economic marginalization in rural areas and lack of access to public services such as roads, educational opportunities, and health care. Depopulation of remote areas in Amazonia potentially improved forest cover as local people left, but also facilitated threats to forest cover including unobserved and uncontrolled logging, gold mining and other resource extraction by outsiders.

While most of the studies locate decisions to migrate as lying outside of the forest sector, Barney's (2012) research in Laos reminds us that changes in forests can also be a part of broader agrarian processes of transformation and thus may serve as the underlying framework within which household and individual migration-related decisions are made. The proliferation of extractive resource projects in the research areas he covered resulted in significant rents captured by the state

and resource firms while undermining local tenure relations and agricultural-based livelihoods. The author concluded that such changes are fueling youth migration out of rural areas and across the Lao-Thailand border.

Researchers have been concerned with what happens to forests and forest use in contexts where the links between sending and receiving countries open transnational spaces within which social and financial remittances can flow, and where relationships between migrants and their families are maintained and strengthened, and where migrants become embedded in more than one society simultaneously. Padoch et al. (2008) show that in Amazonia many rural–urban migrants keep their rural consumption patterns in cities and continue to play a role in rural forest use decisions (Beard and Sarmiento 2010). Through the use of cell phones, women left behind in Yucatan, Mexico, confer with their migrant husbands in the United States over land-use decisions (Radel et al. 2010, 2012), as do women in Nepal (Adhikari and Hopley 2012). Decisions about whether to send money home for investment in land, livestock or other expenditures are made by women migrating from forest areas in East Java to Hong Kong, Taiwan and Singapore; both alone and in concert with their husbands in the villages (Peluso, pers. comm., July 2015).

In further unpacking the effects of migration, researchers have pointed to the potential synergies and trade-offs between rights and livelihoods of people in forested landscapes and the condition of forests. A good illustration is Taylor et al.'s (2006) research in forested landscapes of Guatemala, which shows that, while migration led to a gradual challenging of ethnic inequalities and erosion of traditional gender roles, migrant money permitted the conversion of rainforest for cattle ranching in what was becoming a labor poor region due to migration. In areas of Central America agricultural retraction and forest expansion occurred in areas associated with migration (Hecht and Saatchi 2007; Hecht et al. 2012).

Research worldwide demonstrates that both the processes of migration and their impacts on forests are socially differentiated. For instance, in light of the trend that men outnumber women as international migrant workers in Asia and drawing on feminist contributions to the study

of migration (see section 2.4), Sijapati Basnett (2013) examined the question of what happens to forests when men migrate and women are left behind. Through an ethnographic study on rural communities undergoing similar rates of male outmigration in rural Nepal, she showed that impacts on forest access and governance are determined by interlocking relations of gender, caste, class and ethnicity. In one village where gender norms were lax but women had depended on men to negotiate with extra-local actors such as the state, men's migration led community forestry activities to become dominated by women, though men still acted as intermediaries between women decision makers and state actors. In a second village, remittances sent by socially disadvantaged (Dalit) men to their households and communities reduced dependence on historical patron–client relationships and bolstered their positions in a caste-based struggle. But it also resulted in the consolidation of power and privilege over Dalit forest use and management among senior, powerful members of the Dalit community. The rules that emerged restricted Dalit women's access to forest products and further reinforced and entrenched gender inequalities. Adhikari and Hopley's (2012) study in a different part of Nepal found that migration has led to greater social mobility for Dalits. Historical patron–client relationships are shifting because many Dalits are using the remittances that they earn from working overseas to purchase land. This has enabled Dalits to transition into land-owning positions where previously they were only agricultural wage laborers. Research in Yucatan, Mexico, showed transformations in gender roles prompted by migration in forested landscapes, although to a lesser degree less than might have been expected (Chowdhury 2007; Radel et al. 2010). Again, income from migration can change both household class positions and divisions of labor in the family, as was found in both the Philippines and in Java (McKay 2005; Peluso, pers. comm., 2015).

While most of these studies are located in areas that are undergoing outmigration, researchers examining forests and migration have also studied contexts where agri-business expansion has led to severe deforestation. Such changes in the investment of capital in a landscape can alter community demographics and land ownership patterns, producing specific forms of social and gendered dispossession among locals and migrants.

This is evident in Tania Li's (2015) account of the implications of migration and oil palm expansion over time in previously forested landscapes of Meliau, West Kalimantan, in Indonesia, where she examined the effects of oil palm on different social groups – women, men, locals, spontaneous migrants and government-sponsored transmigrants. Her research shows highly uneven effects of oil palm expansion on job creation and poverty alleviation. Among smallholders, couples who were able to maintain diversified farming systems and added oil palm to their repertoire benefitted more than did transmigrants who were granted limited amounts of land, particularly when the children of transmigrants came of age to take over the oil palm holdings. Over time, the number of large-scale plantations grew and came to

monopolize territories that were predominantly government forest. This further constrained smallholders, especially women and limited their opportunities to profit from oil palm and other crops (Li 2015). In an earlier piece, Julia and White (2012) found that women were losing their control over family customary land when oil palm schemes giving out land titles came into their villages. The problem was that the women's names did not appear on the titles; rather, their husbands' names were put on the formal titles following Indonesian government practice. Not only the women's claims to these titled lands, but also those of their entire extended family with claims in the customary parcels prior to oil palm and titling, were lost, hidden from view on the title.

4 Migration and forests on the development frontier

It is often reported that forest conversion for both subsistence and commercial agriculture is the most immediate cause of forest clearing but underlying causes are more complex and less well understood (Angelsen and Kaimowitz 1999; Hersperger et al. 2010; Hosonuma et al. 2012; Babigumira et al. 2014). Moreover, the term, ‘commercial agriculture’ encompasses both a smallholder’s shift to commodity or cash crops as well as massive landscape transformations to monocrop plantations. Forest cover changes cannot be explained as a simple reflection on population growth or supply–demand market forces. Large-scale assessments of land-use change in fact have found little correlation between population density and forest cover (Clark et al. 2012; DeFries 2010; Hecht 2013).

When and where migration has been directly linked to forests, however, the story often told is a simplistic one of rampant deforestation on forest–agricultural frontiers. From the 1970s into the 1990s, when forest colonization was an active feature of regional development policy in Latin America, particularly, forest conversion was exceptionally high. In 1991, the World Bank (1991) suggested that 60% of deforestation in developing countries could be connected to the expansion of agricultural frontiers, whereas logging operations accounted for only 20%. A large number of studies have documented the drivers, magnitude, and biophysical and social implications of this massive conversion. Migrants have often been part of formal land and regional development policies, a desired outcome for state planners interested in regional integration in contrast to the spontaneous migration we see today. And yet, deforestation has been generally underrepresented in the literature on migration even though it has featured prominently in regional development literature (Carr 2008a,b; Lopez-Carr and Burgdorfer 2013).

Historically, modernizing and often authoritarian states hoping to deflect agrarian reform in heavily occupied and contested areas have sent migrants to frontiers. Other motivations for these programs have included regional and cold war geopolitics, internal politics and regime legitimation, and a means of consolidating national boundaries and control over tropical resources of many kinds (Geist and Lambin 2001; Peluso and Vandergeest 2011). Among the many examples of such government-initiated movements into forested frontiers are: Menzies’s (1994) documentation of the sending of Han Chinese to many ethnic forested frontiers by Imperial China; Yeh’s work in Tibet (2014); Dove’s (1985) work on pre-colonial Java uplands; and Hecht and Cockburn (1989, 2010), Bunker (1985) and others on Brazil’s Amazonian frontier occupations. Such migrations have also occurred in areas of Chile occupied by the indigenous Mapuche, in contemporary and colonial Indonesia (Vandergeest and Peluso 2006a, b), and Malaysia (Hong 1991; Sioh 1998), among many others. Often spontaneous, actor-initiated migrants who move to frontiers are driven by resource booms, road building activities and other government-sponsored activities.

Where government policies are not actively promoting migration, migrants are drawn to settle in places where land is available and where state presence, monitoring and institutions and/ or competition for land may be weak (Amacher et al. 1998); these locations are often found at forest margins in tropical countries. Poor migrants are drawn to tropical forest frontiers because they lack access to land or other capital goods (Bilsborrow 2002). However, migrants with high or medium income are also a key presence on forest frontiers and their investments and land-use practices (mining, logging, commercial agriculture and livestock production) can create the conditions for further migration and forest conversion. In

Amazonia, most clearing is still done for livestock production, as an increasingly global commodity. Recent research by Godar et al. (2014), and others in the Brazilian Amazon found evidence that almost half of the region's deforestation (36,158 km²) that occurred between 2004 and 2011, was found in areas of large holdings, (>500 ha), a pattern not unique to Brazil. Areas where smallholders (with <100 ha) dominated accounted for only 12% of the deforestation (9720 km²).

Pasture is also a means of land claiming or speculation and a means of capturing credits and other forms of institutional rents (Hecht 1993; McAlpine et al. 2009; Walker et al. 2009; Roebeling and Hendrix 2010; Busch and Vance 2011; Bowman et al. 2012). Indeed, the transformation of a primary forest, the replacement of native vegetation with newly planted trees, and even the carving of a swidden field out of the forest is a well-documented means of claiming land and territory all over the world. The expansion of production of large-scale commodity crops, such as coffee, palm oil, soybeans and cattle destined for global and domestic urban markets, rather than the migration of smallholders, is a key cause of rapid tropical deforestation on forest frontiers (Dauvergne and Neville 2010; DeFries et al. 2010; Meyfroidt et al. 2014).

The 'empty tropics' has been one of the abiding myths of tropical regions (Neumann 1998; Peluso and Vandergeest 2011; Barlow et al. 2012; Hecht et al. 2014), a factor which has made forest frontiers highly contested. At the same time, it is important to keep in mind that tropical rural to rural migration is eclipsed by the dynamics of rural to urban migration. This section has focused on literature that frames migration as a driver of forest loss. As we see in the next section, however, migration has also been instrumental in forest recovery (Hecht 2014b).

4.1 Forest resurgence

One aspect of the forest transition refers to forest recovery or resurgence on previously cleared lands that are allowed to go through managed or unmanaged succession or are intentionally reforested. This transition in Western Europe and North America reflected the rise in urban and industrial jobs, and was partially the result of

technical changes in agriculture, rural enclosures, the consolidation of land holdings, spatial shifts in agriculture and the rise of labor costs in rural areas. This was attended by significant depopulation of rural areas as less privileged and less industrialized farmed areas returned to forests. Forest resurgence in the Euro-American model was also aided by an almost complete shift in energy sources from wood to fossil fuels (Mather 1992).

Scientists and policy makers have been slower to recognize forest resurgence in tropical forest areas. Although forests continue to be felled in some areas of the tropical world, in others deforestation is slowing, and areas that have been cleared are being reclaimed by woodlands (Hecht et al. 2014). This is not to say that tropical deforestation has stopped, but it suggests that many early drivers of deforestation have changed. The magnitude of these changes suggests that there are also profound changes that may lead to increased simplification of some forested ecosystems (such as plantations of oil palm or clonal eucalyptus) (Brookfield et al. 1995) or a re-biodiversification as former agricultural lands, cleared areas and pastures are invaded by successional vegetation.

Forest destruction continues but rates of forest clearing have, in fact, declined substantially in some locations and tree cover has increased as the frontiers have stabilized (Brondizio 2004; Nepstad et al. 2006; Hecht 2014a, b; Hecht et al. 2014). While significant expansion of woodlands has been observed in areas of Latin America, they are also found in parts of India, the Philippines, parts of South Africa, parts of Nigeria, Ethiopia and Vietnam (Linderman et al. 2005; Mather 2007; Hecht 2009; Lambin and Meyfroidt 2010; Hecht 2012; Aide et al. 2013; Shackleton et al. 2013). Although global estimates do not exist, in the Brazilian Amazon, it was estimated that secondary forests covered 16.9 million hectares of land in 2002, representing 12.6% of the forest area (Neef et al. 2006) and is a generalized process in Latin America as a whole (Aide et al. 2013). Studies of forest resurgence have recently exploded as has its theorization (Mather and Needle 1998; Perz and Skole 2003; Rudel et al. 2005; Barbier et al. 2010; de Jong 2010; Meyfroidt et al. 2010; Aguilar-Støen et al. 2011; Hecht 2012, 2014; Redo et al. 2012; Meyfroidt 2013). Forest regrowth can take many forms, from monocultural plantations, secondary regrowth to mosaics of

domesticated forests intertwined within arable farms. The different forms of returned forest each have ecological values that vary, whether for carbon storage or biodiversity or livelihood characteristics. Drivers and processes that shape the social and biotic structure of these woodlands, remain key theoretical and empirical questions. An important feature of forest resurgence trajectories has been migration and the forms and patterns that it takes. Forest recoveries have multiple dynamics that produce a range of pathways, including multiple and often interlinked classes of drivers. Each of these has or can have migration implications and affect forest dependence through changes in access and control (Agrawal and Benson 2011; Nolte et al. 2013; Hecht 2014a,b). The drivers of forest resurgences have been described, for example, in economic terms (forest product demand, environmental services demand, production efficiencies, trade policies and globalization), as ecological drivers (environmental degradation, soil depletion), as socially driven (abandonment of degraded land or purposeful succession in

shifting cultivation) and as a result of state-led policies (resettlement, state led reforestation, conservation and payment for ecosystem services schemes). In addition, the emergence of a range of other dynamics such as new governance regimes and institutions, forest tenure reform, conservation politics, violence and, finally, non-forest policies with important agrarian implications and forest spillovers, such as trade policy or conditional cash transfers, have also produced significant forest cover change.

Considering another relationship between outmigration and forests, Robson and Berkes (2011) found unexpected negative impacts on forest biodiversity. The decline of land-use activity in Oaxaca, Mexico – an outcome of rural outmigration – was found to be leading to a gradual loss of the forest–agriculture mosaic, further resulting in declines in biodiversity, despite extensive forest resurgence (Robson and Berkes, 2011).

5 Conclusion: Issues, gaps and emerging questions

Rural livelihoods, whether in forested or non-forested landscapes, are now commonly formed from multiple localities within and beyond the rural, encompassing the peri-urban, urban and transnational. Migration overall is a livelihood, investment and resilience strategy. It is conditioned by dynamics across multiple sectors and varying scales and is affected by macro policies, transnational networks, regional conditions, local demands, political and social relations, household options and individual desires. Because migration processes engage with rural populations and spaces in the tropics, they inevitably affect forest resources through changes in use and management. Yet links between forests and migration have been overlooked too often in the literature on migration as well as in discussions about forest-based livelihoods. The forest question is either subsumed in the formal literature under 'agricultural' or 'rural' without differentiation, or it is ignored.

Scholars of migration, urbanization, agriculture and forest management have elaborated large bodies of history, theory, methods and practice on these topics, building only on findings and framings within their own disciplines. The major objective of the paper has been to draw upon and bring together research done on both migration and forests. As such, the paper has focused on key lessons from these literatures to inform students of forest dynamics seeking to understand migration's effects as well as migration researchers unpacking 'the rural' to consider migration's relation to forests.

A major issue arises in the varied definitions of migrants and migration. Much of the literature focused on forests overlooks the intricacies and differences between types of migrants, the bases of their decisions to migrate and to invest their salaries, and the spatial, temporal, economic and social complexities of their movements. Movements may be officially sanctioned and documented or clandestine, permanent or circular,

internal or external, rural to rural, rural to urban or vice versa; each may have multiple impacts on livelihoods. Migration will also likely produce differing outcomes for landscapes and forests, depending on the social and environmental contexts to and from which people migrate. Which family members migrate, which do not, as well as the timing, the goals and results of migration, are conditioned by a range of macro push and pull factors mediated by micro trends, contexts and structures that combine to inhibit or facilitate individuals' or households' decisions to move or stay. Understanding these variations and building that understanding into further research that seeks to link changes in forest cover to migration and vice versa may help shed light on what appear to be contradictory findings.

Much data on migration and remittances have major limitations and important gaps; government institutions in particular have not systematically integrated migration and its nuances into their research frames for collecting agricultural, economic and population data. Relevant datasets are often narrow and difficult to compare. Numbers on formal (legal) and international migration and financial transfers are notably better than those that measure internal movements, illegal migration, and personal transfers of funds. Even the existing information on international remittances and migrant populations varies across countries. Many migrants and transactions remain uncounted and unknown to data collection agencies. For internal migrants, data accounting for mobility rarely exist and data on internal remittance flows are limited to informal accountings and estimates by case study researchers. Available data are difficult to compare because of differences in the types of data, the intervals in which migration is measured and the statistical geographies in which they are described (Bell and Charles-Edwards, 2013). Data and information on social remittances and

in-kind remittances exist only in case studies. These limitations will hamper research on the nexus between migration and forests, including the writing of comparative, regional histories of migration and forest trends.

The recent literature on migration demonstrates that the distinctions between rural and urban spaces are becoming increasingly blurred. Dividing the rural and urban is misleading, as Rigg (2013) asserts: the urban and rural need to be understood as “co-existing and contemporaneous”; migration and mobility bring the urban to the rural and vice versa through exchanges of finances, goods, ideas and practices. Furthermore, with increasing recognition of stretched, multi-local, or translocal households – all of which are dynamic, constantly changing categories – questions arise about how to define ‘households’ when members are distributed across multiple locations.

This paper has reviewed some of the research on the nexus between migration and forests and demonstrated how it helps elucidate the relationship between the two from multiple viewpoints and in several dimensions, spanning the environmental, economic, political and social. Nevertheless, much existing literature remains premised on simplistic and dichotomous assumptions. Many observers still argue that tropical deforestation is an outcome of migration into forests or that forest recovery is a consequence of migration and/or alternative land-use investments. Each of these potential impacts on forests has been shown to occur, but the many mediating factors – including different historical and geographic contexts – that influence these outcomes are still little researched and narrowly understood. Clearly, very complex mediating factors change the ways forests are perceived and used. Under some conditions, migration threatens forests while others enable them to thrive.

While the above challenges remain and we still have little empirical data for understanding how and when different trajectories are taken, there are a few insights that emerge from this preliminary review. Among these insights, we would include:

- While migration has long been a (misunderstood) feature of communities living near and using tropical forests, contemporary mobilities are different in size and scope, making migration central to understanding the past, present and future of forests and forest-based communities.
- Given the prevalence of circular patterns of mobility and multi-locality, the movement of individuals away from forest areas rarely, if ever, leaves rural places empty or devoid of economic activity. Emigration (or outmigration) thus does not necessarily lead to forest resurgence, in some instances lower population densities in forest areas lead to increased deforestation because of lower protections and new uses of the forest that ensue.
- Changing (and or varied) patterns of gender and age [across history and cases] among both migrant populations and those remaining in rural areas are essential to understanding the effects of migration on forests.
- Massive population flows between rural and urban areas are not only altering forest use and resource consumption through the urbanization of rural areas and populations, but also the ruralization of urban places and populations.
- Research shows that remittances have impacts on forest cover, on biodiversity and other forest characteristics, and on the use of forest products. These effects, however, have been shown to highly variable. Again context matters.
- In contrast to local opportunities for off-farm employment, labor migration often brings more social and economic change. Despite higher social and economic costs to initiate, the higher salaries often available elsewhere may bring greater potential for class mobility and changes in gender and generational relations, in turn resulting in shifts in land use and forest dependence.

5.1 Research gaps and challenges

The issues discussed above provide the foundation for a number of promising directions for research on forests and migration using multiple approaches. Such research carries varied normative commitments ranging from a concern over forest conditions to safeguarding the rights and capabilities of communities that manage and use the forests. It is clear that current data gathering, including national demographic and economic censuses, rarely capture the importance of forests or migration to rural or household livelihoods. Migration as an adaptive strategy and forests as buffers should be considered in light of not only environmental change but also economic and political shocks. How forests figure in the livelihood strategies of both migrants and the households remaining is understudied.

To understand the nuances of spatially divided households and to capture the patterns of change, we need research that is able to track people “across space, sectors, life stages, and time periods” (Rigg et al. 2012, 1477).

There is a need to understand implications of migrants’ remittances for forests and peoples’ livelihoods, whether these be internal or international or monetary, in kind or intangible. Tracking the elusive internal migrant may be particularly important given that some research has shown internal migrants to be more inclined to send and receive remittances, both cash and in kind than their international counterparts (Esipova et al. 2012). The potential roles of skills and other social remittances that migrant returnees bring back in transforming forested landscapes also merit further consideration. Relevant demographic and social dynamics need unraveling; how differing gender, class, ethnicity and other dimensions of social differentiation influence forest uses, dependency, and rules and norms over access to and control of forests in a situation of accelerated migration (Mathews 2011). Overall the impacts of both direct and indirect remittances on forests depend on a number of factors, but how and why investment is occurring is difficult to assess at the landscape level; it requires household level research.

Migration issues need attention but should also be studied in light of other important trends and transitions related to rural landscapes and forests such as the declining number and role of small farmers as food producers, the instabilities of commodity markets, the decline in open land frontiers, the increasing importance of off-farm and wage labor for rural household incomes, the corresponding effects of feminization (and in some instances masculinization) and geriatrification of rural populations and landscapes and the effects of escalating violence and instability in many tropical developing countries on migration and forest use.

This paper has attempted to connect the rural, urban, and transnational to discuss how forest-dependent communities contribute to these processes and influence the effects of these trends and processes on forest transformations. In doing so, the paper has outlined some of the salient trends and transitions of migration, attempted to untangle the relationships between migration, urbanization, remittances and forest transformations, and suggested some directions for future research either focusing on migration and forests or using migration and/or forests as an analytical lens to explore broader agrarian and landscape level transformations.

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Migration is not new. In recent decades however, human mobility has increased in numbers and scope and has helped fuel a global shift in the human population from predominantly rural to urban. Migration overall is a livelihood, investment and resilience strategy. It is affected by changes across multiple sectors and at varying scales and is affected by macro policies, transnational networks, regional conditions, local demands, political and social relations, household options and individual desires. Such enhanced mobility, changes in populations and communities in both sending and receiving areas, and the remittances that mobility generates, are key elements of current transitions that have both direct and indirect consequences for forests. Because migration processes engage with rural populations and spaces in the tropics, they inevitably affect forest resources through changes in use and management. Yet links between forests and migration have been overlooked too often in the literature on migration as well as in discussions about forest-based livelihoods. With a focus on landscapes that include tropical forests, this paper explores trends and diversities in the ways in which migration, urbanization and personal remittances affect rural livelihoods and forests.



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